

NUCLEAR GENOCIDE IN CANADA

by Pat McNamara 2009

Introduction

Take a moment and list off the nuclear issues in Canada you are aware of: radioactive waste, medical isotopes, radioactive leaks and new nuclear reactors will come to mind. The media reports on little more. Few Canadians know how many communities and environments have been contaminated forever by the nuclear industry. Even fewer know the number of radiation-induced illnesses and premature deaths the Canadian Government has knowingly caused through its actions and inactions.

These papers list a wide range of nuclear issues and situations that have been caused and, for the most part hidden, by the Canadian Government since their involvement in nuclear weapons and nuclear electricity generation began 65 years ago. The government's current attempt to expand their involvement into all parts of the nuclear fuel cycle is particularly frightening.

Much of the following information has been uncovered and exposed by members of the affected communities trying to hold our government accountable. Residents of Port Hope, Deline, Serpent River and other towns have been forced to undertake and fund their own research for over 40 years into elevated disease rates and premature deaths among their family and friends. I can assure you that it is NOT a pleasant, inexpensive or simple task.

My involvement began in 2004 when I found out my daughters' elementary school in Port Hope Ontario was built on radioactive waste. In 1978, the Canadian Government found radon levels under the kindergarten and gymnasium 125 times higher than the allowable level. They covered up these test results and allowed children to be taught in the school for the next 28 years to avoid the cost of cleaning it up and the bad publicity that would follow. The following is little more than an outline of our nuclear, past, present and future. It is written in simple language that anyone can understand. It is important for Canadians to become aware of these issues. As you read this, think of the impact our nuclear involvement will have on you, your children and your grandchildren. What price will they pay economically, environmentally and to their health?

The Canadian Government and the nuclear industry continue to try to hide the long-term and lethal dangers we face from our exposures to uranium mining, refining, abandoned tailings piles, conversion facilities, contaminated towns, reactors and radioactive waste.

Simply stated: the Canadian Nuclear Safety Commission, Health Canada, Natural Resources Canada and Atomic Energy of Canada Limited are corrupt and incompetent regarding their responsibility to protect us from the nuclear industry. They are guilty of a nuclear genocide in Canada.

I have quoted many sources throughout these papers including people from communities that have been hit the hardest. Their comments and accusations against the Canadian government are just as harsh as mine. It's hard to be delicate when you realize your friends and families are being sacrificed to allow the nuclear industry to prosper.

Pat McNamara

PART 1

In the Beginning - Port Radium Mine

The Port Radium mine opened in 1932 in the North West Territories. Radium is a radioactive material that is part of the decay chain of uranium. In the 1930s, radium was trumpeted as the new wonder drug to cure cancer and as a 'glow-in-the-dark' paint. It was the most expensive material on Earth at the time, commanding prices up to \$125,000 per gram.

Canada's Department of Mines warned the Canadian Government in its 1932 'Blood Studies on Port Radium Miners' about the dangers of radiation and radon gas in particular. The report stated "that a hazard may exist in the breathing of air containing even small amounts of radon." No warning was given to the white miners or to the First Nations people from Deline who were hired as porters. The mine shut down and the radium industry collapsed in 1940 when its lethal health effects became known to the public.

One of the main uses for radium at the time was as a paint for the numbers on clock faces so they could be seen in the dark. The painting was done by hand, almost exclusively by women. To get a fine point on the brushes, the women would twirl the brush in their lips, thereby ingesting some of the radium. The health of the women deteriorated quickly; their jaws literally disintegrating.

The Canadian Government expropriated the mine in 1942 and created a company called 'Eldorado Nuclear Ltd' to supply uranium to the American nuclear weapons program. A Federal research team from Montreal sent to monitor the mine in 1945 reported "the radon content seems to be so high as to be definitely dangerous to the health of those working in the mine." Once again, no warning was given to the miners or to the First Nations people who transported the uranium ore.

Refer to: Somba Ke, ([here](#)) a one-hour documentary on Port Radium and Deline by [David Henningson]

Village of Widows

The First Nations people of Deline, North West Territories were hired to carry burlap sacks of uranium ore from the mine to the barges on Great Bear Lake. The bags of radioactive ore had to be handled several times on their journey. The workers slept on the bags of uranium all the way to Fort McMurray where they were transferred for shipment to the Port Hope Refinery.

In 1960, cancer claimed its first victim in Deline. They didn't know what it was because there had never been cancer there before. Over the next few years, most of an entire generation of men in the community died as a result of their exposure to the radioactive material. So many men died that Deline has become known as 'The Village of Widows.'

Cindy Kenny-Gilday from Deline wrote:

"Deline is practically a village of widows, most of the men who worked as labourers have died of some form of cancer. The widows, who are traditional women were left to raise their families with no breadwinners, supporters. They were left to depend on welfare and other young men for their traditional food source. This village of young men are the first generation of men in the history of Dene on this lake to grow up without guidance from their grandfathers, fathers and uncles. This cultural, economic, spiritual, emotional deprivation impact on the community is a threat to the survival of the one and only tribe on Great Bear Lake. It's the most vicious example of cultural genocide I have ever seen and it's in my own home."

The people of Deline did not know what was causing it. They contacted the Canadian Government for help. The Canadian Government did nothing despite illness rates twice as high as any other First Nations community in Canada. The Canadian Government waited until 1998 to inform Deline that it was their exposure to radiation that was killing them. They did not make this admission until after the people of Deline had identified the cause through their own research. Andy Orkin, an Ontario lawyer who worked on behalf of the Deline First Nations people said it best:

"We left them to die and hoped they would never ask any questions."

Deline was the first community in Canada that tried to find out what was causing unusual illnesses and premature deaths in their community. They were very isolated and did not have the expertise to hold the government accountable for the harm caused by their exposure to the nuclear fuel cycle. They

have been fighting for justice for the past 47 years.

Refer to: Cindy Kenny-Gilday's paper: 'The Village of Widows'

Andrew Nikiforuk's Calgary Herald article titled: 'Echoes of the Atomic Age.'

Port Hope Refinery

Radium was extracted from the uranium ore in the middle of Port Hope Ontario starting in 1932. Several thousand tons of uranium ore would have to be processed in the refinery to retrieve one gram of radium. The large volume of radioactive waste uranium ore was dumped in the harbour, in ravines and was given to anyone who wanted it as fill material. This practice continued until 1966.

Dr. Marcel Pochon, the first manager of the Port Hope Refinery issued the first warning in Port Hope in 1933 when he told a reporter that:

"Radium is highly dangerous, the slightest fraction of a milligram taken into the system leads to cancer, anemia and disease of the hip bones. Not a doctor on Earth can save the unfortunate person who is affected." (Port Hope Evening Guide)

The Canadian Government did not warn the people working at the facility, the people who took the waste uranium ore nor municipal officials of its dangers. The Port Hope Refinery was closed in 1940.

Refer to: Blind Faith ([here](#)) by Penny Sanger, 1978

Eldorado Nuclear

Eldorado Nuclear was created by the Canadian Government in 1942 to supply uranium to the United States to develop the first atomic bombs. They expropriated/bought the Port Radium Mine and the Port Hope Refinery from Gilbert Labine. The company was always shrouded in secrecy because of its war-time mandate.

In 1988, Eldorado Nuclear and the Saskatchewan Mining Company (owned by the Saskatchewan Government) merged and were privatized as Cameco Corporation. Cameco is the largest supplier of uranium to the global market; Canada supplies 40% of all uranium used on the planet.

Refer to: Eldorado by Robert Bothwell, Professor, University of Toronto

Manhattan Project

The Canadian Government joined the United States and Great Britain to develop the first atomic bomb in a secret endeavour called the Manhattan Project. Ore from the Port Radium Mine was not readily available, so the authorities recovered waste uranium ore that was dumped all over Port Hope between 1932-1940. It's a sad irony that the first radioactive waste cleanup in Port Hope supplied the uranium for the first atomic bomb that killed 140,000 people in Hiroshima.

The American Government repeatedly warned Canadian officials of the dangers of radiation as evidenced by documents released in the United States. Unfortunately, the Canadian Government never passed this warning along to its citizens.

Canadian Nuclear Safety Commission (CNSC)

The Canadian Government enacted the Nuclear Control Act in 1946. They created the Atomic Energy Control Board (AECB) the same year to administer the act.

In 1997, the Nuclear Control Act was replaced with the Nuclear Safety and Control Act. The primary mandate of the new act was to ensure the safety of Canadians from exposure to the nuclear industry. The Atomic Energy Control Board was also replaced in 1997 by the Canadian Nuclear Safety Commission. The safety of Canadians was supposed to be its primary responsibility. However, as you'll see in this book, rather than being the watchdog of the nuclear industry, it became its lapdog.

There are two parts to the CNSC. The CNSC is headed by a president appointed by Ottawa who oversees a staff of about 500 people in a variety of disciplines. They handle all the day to day activities including collecting information and writing reports. The second part is the CNSC Commission comprised of six members of the public who are referred to as Commissioners. The president of the CNSC is also chairperson of the Commissioners.

Atomic Energy of Canada Limited (AECL)

AECL was created in 1952 to develop and promote nuclear reactors on behalf of the Government of Canada. They were also given the responsibility of dealing with the radioactive waste created by Canada's nuclear program. This put AECL in a conflict-of-interest position. It has never been in their best interest to divulge the true severity and costs of nuclear waste when they are trying to promote the sale of reactors.

AECL has received over \$20 billion in direct operational subsidies from the Canadian Government since their inception. They have been given \$650 million in subsidies in 2008-2009 alone. Their legacy of reactor accidents, cost overruns, premature reactor shutdowns, failed reactor designs, redundant heavy water plants, contaminated communities, radiological waste disposal and impending legal actions against them will cost taxpayers billions of dollars more.

Chalk River Nuclear Laboratory

Chalk River Laboratory opened in 1944 and was the home of the first nuclear reactor outside the United States. AECL took over operations of Chalk River from the National Research Council in 1952. From 1955 to 1976, Chalk River facilities supplied plutonium from spent reactor fuel, to the United States Department of Energy to be used in the production of nuclear weapons. Chalk River was used as a nuclear laboratory by AECL for nuclear research and the development of reactors. It is home to the NRU reactor which produces half the world's medical isotopes.

Elliot Lake

There were 12 uranium mines opened near Elliot Lake in the early 1950s to supply uranium to the American nuclear weapons program. The radioactive tailings from mining and milling were dumped into ten lakes close to the mines. The contamination killed all ten lakes and 90 kilometres of the Serpent River. The Canadian Government allowed a sulphuric acid plant to be built in the middle of the nearby First Nations community of Serpent River with no concern for its impact on the residents.

In 1974, the Ontario Government appointed Dr. James Ham to study mine safety at Elliot Lake. He concluded that "Neither the workers nor their representatives were advised about the emerging status of the problem of lung cancer." Dr. Ham, a Past president of the University of Toronto also conducted an inquiry into the actions of the Workers Compensation Board in the 1970s. The inquiry led to the reversal of over 100 compensation claims against radiation induced illnesses and death. According to nuclear professor, Dr. Andrews:

James Ham had at that time (1976) discovered that, in spite of the assurances of the WCB and other medical experts, deaths were now coming off the assembly line." (Dr. Andrews, University of Toronto, 1996)

The balance of this section on Elliot Lake is taken directly from Lorraine Rekmans book, 'This is My Homeland.' It is an account of the degradation of their way of life caused by the uranium mines, the sulphuric acid plant and the disregard to their health shown by the Canadian government.

"The resultant contamination, destruction and degradation of hunting, fishing and gathering areas is grossly offensive and inevitably an assault on an

entire way of life shared by the original people for generations. There are ten lakes lost for eternity at Elliot Lake. These lakes were used as dumping grounds for radioactive waste. There is no sanitary way to describe the incident."

"The miners at Elliot Lake lost their lives digging this rock out of the ground. The ground-waters under the tailings basins are virtual rivers of poison. The people who worked and lived around the sulphuric acid plant suffered severely."

"Good clear drinking water and fish habitat, wildlife, and plants have been destroyed for the benefit of a few people. Weapons producers, nuclear energy developers, and others have demonstrated no regard for the sanctity of an entire ecosystem. They have demonstrated total disrespect and disregard for an entire community of people who rely on this land to survive. They were privy to information about the known dangers of uranium before the mines were opened and did not share this knowledge with vulnerable and unsuspecting people."

"In essence, their accumulated wealth was at the cost of uncounted human lives. The impact and health effects, the disease, and cancer resulting from the contaminated tailings sites and the sulphuric acid plant has yet to be measured. The voices of Anishnabe people need to be heard. Their story needs to be acknowledged."

"The devastating effects of nuclear industries on this remote Anishnabe community undeniably and unmistakably involve international corporations, governments and institutions. We must face the broad issues of responsibility for severe harms and dangers. The need to act is critical.

- 1963 - The United Steelworkers of America discover that despite knowledge of the high risks of cancer and other illnesses from radioactivity and chemical toxicity in the mining processes and from the waste tailings, neither mining companies, nor the federal or provincial governments give the 10,000 workers or residents any protection or warning.

- 1955-1978 - As reported by the Rio Algom and Denison Uranium Mining companies, more than 30 uranium tailings dam failures occur during this period, dumping radioactive isotopes and chemical toxins into the Serpent River watershed. These dams were constructed to contain uranium tailings, the waste product from mining and milling.

- 1950s-1960s - Miners' housing, built in Elliot Lake on roads made of fill mixed with uranium tailings. Fill for housing sites consists of waste rock from mines.

- 1963, 1966, 1976 - Ontario Water Resources Commission surveys and reports show high levels of radioactive and chemical contamination in all 55 miles of the Serpent River waterway downstream from the mines and tailings sites. The 1963 survey already shows that 'uranium milling operations had a profound effect on the biota.' No fish are living in the watershed.

- 1969, 1976 - Reports by the Ontario Workmen's Compensation Board (1969) and the Royal Commission on the Health and Safety of Workers in Mines (1976) show high levels of lung cancers among Elliot Lake/Serpent River area miners.

- 1975 - Power failure at Stanleigh Mine results in a 500,000 gallon spill of radioactive and chemically contaminated water into McCabe Lake.

- 1975 - Quirke 2 Mine fractures Serpent River streambed, causing the river to flow into the mine.

I write this mostly for my children. One day, they will have questions. One day, I might have to explain how we came to this place in time, where we have nuclear bombs, radioactive waste, spent fuel rods, genetic deformities and wastelands." (Lorraine Rekmans, *This Is My Homeland*)

Lorraine Rekmans' book is a series of conversations and short essays by the residents of Serpent River who were most affected by the mines. Though the mines closed in the 1980's, the damage they caused will last for tens of thousands of years. The contamination of the Serpent River watershed can never be undone. The harm they caused the people living there should never be forgotten or forgiven.

Pinawa-Whiteshell Nuclear Laboratory

AECL started building the Whiteshell Nuclear Laboratory at Pinawa Manitoba in the early 1960s. AECL started shutting down the laboratory in 1998. At its peak, 1300 people worked on site. There are currently about 300 people working on decommissioning the facility and cleaning up the site. Pinawa was the home of the WR-1 reactor, the largest organically cooled, heavy-water-moderated reactor in the world. The Slowpoke reactor was conceived at Whiteshell in 1967 as well.

The Whiteshell Laboratory is responsible for cesium contamination in the north end of Lake Winnipeg. The problem was discovered by Dr. Lyle Lockhart of the Freshwater Institute. AECL denied they were responsible and refused to provide any further information to the public about accidents or spills at their facility.

Pinawa residents grew concerned about the amount of contamination AECL was causing at the site and whether they would be undertaking remediation. The first opportunity to voice their concerns came at the Seaborne Inquiry investigating the options for the storage of radioactive waste in Canada. A local resident (Lac du Bonnet) stated:

"An example of just how things change in nuclear waste practices in only a few decades is the burying of 2,500 drums of radioactive waste in unlined trenches at Whiteshell. According to a letter from the AECB to myself, radioactive waste in various packages, including steel barrels, had been placed in unlined earth trenches at the waste management areas from '65 until the late '70s. AECL recently revealed to the Control Board that they are unsure from a safety perspective whether to leave the barrels there or to recover them." (Dave Taylor, Seaborne Inquiry)

Uranium Hexafluoride

The Canadian Government decided to expand Eldorado's (Cameco since 1988) operation to produce Uranium Hexafluoride (UF6) in the mid 1970s. They carried out a site evaluation on 11 locations in Ontario. The Town of Port Hope was not evaluated because it was impossible to have a 1000 metre buffer zone around the UF6 facility as was required by the Atomic Energy Control Board at the time. The 1978 document prepared by Eldorado Nuclear Limited titled 'Environmental Impact Statement for a UF6 Refinery in Hope Township' states:

A major factor in selecting specific refinery sites is the accepted industrial practice of placing a 'buffer zone' around nuclear facilities as required by the federal government's regulatory agency, the Atomic Energy Control Board."

The evaluation showed none of the 11 sites met the criteria to host the UF6 facility. Without any further assessment or justification, the Canadian Government announced the UF6 plant would be built in the middle of Port Hope. The Canadian Government broke its own laws and Port Hope has been paying the price ever since. The people of Port Hope are the buffer zone for Cameco and Zircatec.

Fuel Rods for Nuclear Reactors

Zircatec Precision Industries manufactures fuel rods for nuclear reactors in Port Hope less than 20 metres from a group home. Zircatec was licensed by the nuclear regulator to possess and process enriched uranium on the strength of a seven-page Screening Report conducted by Atomic Energy Control Board staff in 1995. There was no public input to the process and the CNSC has refused to provide the community with the documents the Screening Report was based on.

Blind River

Cameco's Blind River Refinery opened in 1983. It processes yellowcake into UO3.

The Ontario Ministry of the Environment has tested for uranium-in-soil since the facility first opened in 1983. Uranium emissions from the plant have

caused an increase in uranium-in-soil levels as noted in the ministry's report of Cameco's uranium spill in 1990. The report states: These increased uranium values were consistent with a gradual increase since the refinery began operations." (Ontario Ministry of the Environment) The spill in question occurred on May 16 and 17, 1990. Cameco estimated that 182 kg of uranium was released to the environment. This is a large amount of uranium. For comparison purposes, Cameco claims to release only 120 kg of uranium from its UO₂ and UF₆ facilities in Port Hope combined for the entire year. In reviewing documents on Cameco's Blind River facility, the concern from the facility is always based on the impact on the town of Blind River several kilometres away. No mention is ever made of the harm caused to the First Nations community located beside the uranium processing facility.

Summary

The Canadian government was repeatedly warned about the dangers from exposure to radiation from 1931 until 1976 by their own ministries and the American Government. Yet there is not a recorded instance in the 50 year period covered by this paper where the workers were warned of the danger. This is completely unacceptable behaviour from the Canadian government. The other point to note is that First Nations people paid a much steeper price as a result of their exposure to the nuclear industry than the whites did. Deline, Serpent River and Blind River First Nations have paid a very high price to keep the lights on in Ontario.

PART 2

NUCLEAR REACTORS IN CANADA

"It is not right to say that a catastrophic accident is impossible. The worst possible accident could involve the spread of radioactive poisons over large areas, killing thousands immediately, killing others through increased susceptibility to cancer, risking genetic defects that could affect future generations, and possibly contaminating large land areas for future habitation or cultivation." (Safety of Ontario's Nuclear Reactors, Select Committee on Ontario Hydro Affairs, 1980)

ZEEP (Zero Energy Experimental Pile)

The ZEEP Reactor started operating at Chalk River in 1945. It was the first reactor to be built outside the United States.

NRX Reactor

The NRX reactor began operating at Chalk River in 1947 to produce plutonium for the United States weapons program. The NRX reactor was shut down in 1993. There was a major accident at the reactor in 1952.

According to Dr. Gordon Edwards:

"The NRX reactor underwent a violent power excursion that destroyed the core of the reactor, causing some fuel melting. Unaccountably, the shut-off rods failed to fully descend into the core. A series of hydrogen gas explosions (or steam explosions) hurled the four-ton gasholder dome four feet through the air where it jammed in the superstructure. Thousands of curies of fission products were released into the atmosphere, and a million gallons of radioactively contaminated water had to be pumped out of the basement and 'disposed of' in shallow trenches not far from the Ottawa River. The core of the NRX reactor could not be decontaminated; it had to be buried as radioactive waste." (Dr. Gordon Edwards, CCNR)

The following is from a letter written to the Ottawa Citizen (June 25, 2007) by two sisters whose father was severely injured in the NRX accident:

"It was a major explosion that demolished one whole building, killed one person and severely injured several others. One of the injured was our father. Charles Weary spent a month in hospital. To counteract contamination, his head and body were shaved and he was washed repeatedly with acid. For the rest of his life he triggered Geiger counters, feared going blind and picked bits of metal from under his skin."

"No compensation was offered to the victims and publicity was carefully controlled – only a small item on page 2 of the Ottawa Journal of that time. We hear of accidents at nuclear facilities in other countries, but Canada's record is officially clean. Wiped clean?" (Barbara & Donna Weary)

This account of the accident contradicts Atomic Energy of Canada Limited's (AECL) version. AECL maintains that there were no deaths or major injuries.

For further information on the NRX and NRU accidents, go to Dr. Gordon Edwards' website:

'Canadian Coalition for Nuclear Responsibility' and read the article titled: '[Reactor Accidents at Chalk River](#).' Dr. Edwards' website is the most complete collection of material on the nuclear history of Canada. The majority of the material is well written and easy to read. Dr. Edwards has spent the past 40 years educating Canadians about the dangers of the nuclear fuel cycle as well as attempting to hold the industry and the government accountable.

NRU (National Research Universal) Reactor

The NRU reactor, built in 1957, was used to bombard different materials with neutrons to generate radioactive isotopes for medicine and other applications. The reactor is still being used to supply 50% of the world's medical isotopes. A major accident occurred at the NRU Reactor in 1958.

According to Dr. Gordon Edwards:

"Several metallic uranium fuel rods in the NRU reactor overheated and ruptured inside the reactor core. One of the damaged rods caught fire and was torn in two as it was being removed from the core by a robotic crane. As the remote-controlled crane passed overhead, carrying the larger portion of the damaged rod, a three-foot length of fiercely burning uranium fuel broke off and fell into a shallow maintenance pit. The burning fuel lay there, spreading deadly fission products and alpha-emitting particles throughout the reactor building. The ventilation system was jammed in the 'open' position, thereby contaminating the accessible areas of the building as well as a sizable area downwind from the reactor site. A relay team of scientists and technicians eventually extinguished the fire by running past the maintenance pit at top speed wearing full protective gear, dumping buckets of wet sand on the burning uranium fuel." (Dr. Gordon Edwards, CCNR)

These two accidents released huge amounts of radioactive material into the water and air around the facilities. As usual, there is no record within the nuclear regulators showing the areas which were impacted by these accidents.

Cleanups of Reactor Accidents

Armed Forces personnel were sent to Chalk River in 1952 and 1958 to clean up after the NRX and the NRU reactors had severe accidents. The Canadian Government did not warn them of the dangers they faced from these high-level radioactive contaminants. The following is the account of one of the Veterans as told to Dr. Gordon Edwards.

"Hundreds of raw army recruits at Petawawa were to be sent into the NRU reactor building with mops and scrub brushes, wearing three layers of protective clothing, and breathing through respirators equipped with charcoal filters. Because of the intense penetrating gamma radiation fields, against which the protective gear offered almost no protection, the men were only allowed to work for about an hour. By that time they were ankle-deep in sweat inside their rubber suits, and they had accumulated a dose of radiation exposure which approached the annual permissible dose limit for atomic workers." (Gordon Edwards)

There were no follow-up health studies on any of these Veterans to quantify the impact the exposure to elevated levels of radiation had on their health. The Canadian Government is still refusing to pay compensation 56 years after the fact. Sadly, the Canadian government is spending more money on lawyers fighting the Veterans in court than it would cost them to pay compensation.

NPD (Nuclear Power Demonstration)

The NPD reactor was the first reactor built in Canada to generate electricity. It was a joint venture of AECL, General Electric and Ontario Hydro. The NPD reactor started producing electricity in 1962 at Rolphoton, Ontario. It was shut down in 1987.

Douglas Point Reactor

The first CANDU reactor started operating at Douglas Point on Lake Huron in 1967. It took seven years to build. It was a 200 megawatt reactor.

Pickering Generating Station

The first two reactors at Pickering started operating in 1971. All four Pickering A reactors were producing electricity by 1973. The first Pickering reactor was shut down for re-tubing in 1983 after less than 12 years of service which was far sooner than AECL's prediction of a 40-year working life. By 1993, all four reactors at Pickering A were re-tubed and back in service.

The Pickering reactors had numerous incidents, accidents and spills over the years. There were times when the problems went on for weeks and months at a time without detection or being reported. The following incidents (compiled by David Martin) were a few of the more severe occurrences.

- *August 1, 1983* Pickering reactor 2 had a 'loss of coolant accident' (LOCA), after a pressure tube suffered a metre-long rupture. The entire station was shut down. The four reactors at Pickering 'A' were eventually re-tubed at a cost of about \$1 billion – more than the original \$716 million cost of the station.

- *November 22, 1988* Pickering reactor 1 had a power excursion caused by operator error that caused damage to 36 fuel bundles. The cooling system was contaminated by radioactive iodine, which was vented over several weeks following the accident. Ontario Hydro did not believe that such an accident was possible, and had to revise its operating procedures and retrain staff.

- *August 2, 1992* Pickering reactor 1 had a heavy water leak from a heat exchanger that resulted in a release of 2,300 trillion becquerels of radioactive tritium into Lake Ontario. This was the worst-ever tritium release from a CANDU reactor, and resulted in increased levels of tritium in drinking water from Whitby to Burlington.

- *December 10, 1994* Pickering reactor 2 had a major 'loss of coolant accident' (LOCA). A pipe break resulted in a spill of 185 tonnes of heavy water. For the first time ever, at a CANDU, the Emergency Core Cooling System (ECCS) was used to prevent a meltdown, and about 200 workers were involved in the clean-up. The reactor was restarted on February 14, 1996.

- *July 21, 1995* Two technicians carried out work on the wrong reactor (Pickering reactor 5 instead of reactor 6), disabling the second fast shutdown system on reactor 5, which was operating at full power at the time.

- *April 15, 1996* Pickering reactor 4 had a heavy water leak from a heat exchanger that resulted in the release of 50 trillion becquerels of tritium into Lake Ontario. The level of tritium in local drinking water peaked at about 100 times the usual level.

- *April 21, 1996* All eight reactors at the Pickering nuclear stations were shut down to repair a backup valve on the Emergency Core Cooling System.

The flaw was detected on April 15th, and the system had been tested one month earlier. Hydro did not advise the public of this situation until April 20th.

- *July 30, 1997* Ontario Hydro revealed that it had failed to report tritium contamination of ground water on the Pickering site for twenty years. In 1979 it found 2,150,000 becquerels per litre (Bq/L) of tritium in ground water, and in 1994 found 700,000 Bq/L. Tritium can cause cancer if ingested.

Ontario's current 'objective' for tritium in drinking water is 7,000 Bq/L, but in 1994 a provincial advisory committee recommended that this level should be reduced to 100 Bq/L, and brought down to 20 Bq/L within five years.

The list of incidents (above) was compiled by David Martin of the Nuclear Awareness Campaign. David Martin has worked tirelessly for the past 2 decades on nuclear issues. He has authored many educational papers as well as submissions and interventions to the nuclear regulators.

Reactor Shutdowns – On August 13, 1997, Ontario Hydro shut down the four Pickering 'A' reactors which were built by 1973. This action removed 2000 megawatts of generating capacity from Ontario's electrical grid. Units 1 and 4 were subsequently refurbished but they were so far behind schedule and over budget that the decision was made to shut down Units 3 and 4 permanently.

Pickering's Reduced Safety Margins – In May 2008, the Canadian Nuclear Safety Commission issued a report saying the safety margins at the Pickering Generating Station have slipped substantially over the years as the reactors continue to age. Decreasing performance and safety margins will require the utility to examine and possibly extend the nuclear emergency planning zone out to 30 kilometres.

Bruce Power

The first four reactors at Bruce Power went into operation in 1978 followed by four more in 1986.

Reactor Shutdown – Ontario Hydro shut down the first of the Bruce 'A' reactors in 1995. They followed that up in August 1997 by shutting down the other three Bruce 'A' reactors for poor performance and safety concerns. These reactors lasted less than 20 years before they were deemed too unsafe to operate. All of the reactors would have to be refurbished at a cost higher than their original costs before they were allowed to start up again. The loss of generating capacity from the four Bruce 'A' reactors represented 3400 megawatts of electricity.

Harm to Community – The heavy water plant at Bruce Power used hydrogen sulphide (sour gas) to extract heavy water from lake water.

'Hydrogen sulfide is a highly toxic and flammable gas. Being heavier than air, it tends to accumulate at the bottom of poorly ventilated spaces. Although very pungent at first, it quickly deadens the sense of smell, so potential victims may be unaware of its presence until it is too late.' (Wikipedia)

This gas was released from Bruce Power daily from 1973 to 1997. Exposures as low as 10 parts per million (ppm) cause eye irritation while death can result from exposures over 300 ppm.

The Bourgeois family, living on a farm near Bruce Power, suffered severe personal injury as well as heavy losses to their livestock. Bourgeois lost 25% of his lambs each year, or five times the normal losses. Bruce Power owner, Ontario Hydro, was adamant the damage wasn't caused by their heavy water plant, so Mr. Bourgeois hired his own consultants to investigate.

'Experts he retained had unravelled the mystery by 1991: At certain times of the year, a thermal layer of warm air forms; the toxic plume of heavier-than-air hydrogen sulphide gets pulled to ground level and collects in low-lying pockets — like his farm. Documents he subsequently uncovered showed that Ontario Hydro had known all along.'

'Other documents revealed that the thermal internal boundary layer — the meteorological phenomenon that can trap a chemical plume — was flagged

to Ontario Hydro and the federal regulator in the early 1970s as a potential problem if the heavy water plant was built at the Bruce site. Ontario Hydro commissioned a further study of the effect in 1984. But no one told Bourgeois.' (April 10, 2004, Kate Harries, Toronto Star)

Neither Bruce Power nor the nuclear regulators would deal with the problems caused by the release of hydrogen sulphide, nor would they agree to implement a warning system when conditions put his family and livestock at risk. Mr. Bourgeois came to the same conclusion so many others have in their dealings with the nuclear regulatory body. 'The only explanation I can think of is that our government is corrupt. It is corrupt because it devised a regulatory structure that is entirely geared to ensure that the people who are harmed have no voice.' (Eugene Bourgeois, 2004)

Mr. Bourgeois' family and farm have not been impacted by the effects of hydrogen sulphide since 1997. It's more than a coincidence that the heavy water plant was shut down that year. For more information on the health impact suffered by the Bourgeois family and animals, read Kate Harries article: '[Sickness, Depression and a Smell of Rotten Eggs](#)' from April 10, 2004 in the Toronto Star. Kate Harries also authored an excellent article on Port Hope for Walrus magazine titled: '[Nuclear Reaction](#).'

Unplanned Shutdown – A piece of equipment malfunctioned during maintenance in the reactor core of Unit 6 at Bruce Power on June 11, 2002. A hole was burned through the pressure tube and the calandria tube that surrounds it, which forced Bruce Power to replace both pieces. This caused the reactor to be shut down for the entire summer when demand for electricity is at its highest.

'Power prices get extremely volatile when demand is high and domestic generators can't supply the full market. On occasions when the province had to import emergency power, the IMO had to pay as much as \$2 a kilowatt-hour to out-of-province generators. Ontario's normal domestic price is about 5 cents a kilowatt-hour.' (John Spears, Toronto Star)

The shutdown was never made public. It only came to light when the Canadian Nuclear Safety Commission released their report in September. Bruce Power tried to play down the entire episode. According to the Toronto Star: 'The only news release made by Bruce Power, on June 12, minimized the accident. It said only that a pressure tube had been 'slightly damaged' and 'the operational impact is not expected to be significant.' (John Spears, Toronto Star)

The impact of the reactor being shut down may not be significant to Bruce Power. They're not the ones paying \$1.6 million per hour to replace the power from the reactor. The taxpayers are.

Hiding Safety Violation – A serious safety violation at the Bruce Power nuclear station was kept hidden by the staff of the Canadian Nuclear Safety Commission from its commissioners during hearings held January 16 to determine if two reactors at the site should be allowed to start up again.

'A Bruce Power engineer botched the installation of a super-sensitive instrument that was supposed to detect the lower-than-normal levels of neutrons in the shutdown reactor. Collisions of neutrons cause the controlled chain reaction of nuclear fission that produces the reactor power. But because the low-level detector was put in the wrong place it was useless. The reactor operators only discovered the mistake after three weeks when they started to let the flow of neutrons build up again inside the reactor.' (Peter Calamai, Science reporter)

Bruce Power reported the problem to the Canadian Nuclear Safety Commission on December 23, when they found out about it. The Canadian Nuclear Safety Commission called it a 'serious event' while Bruce Power CEO Duncan Hawthorne tried to downplay the severity of the event by describing it as 'a technical breach.' Duncan Hawthorne told the Toronto Star that 'The operators caught it (the problem) quickly.' The truth of the matter is that they didn't find out about the problems until three weeks after it happened.

The commissioners and the public were not told of the problem until February 12; four weeks after the start of the hearings. Needless to say, the commissioners were not impressed.

Soil Contamination – 1996 – Groundwater monitoring wells at RWOS 1 showed leakage of radioactive contaminants (e.g. tritium), often in excess of the Ontario Drinking Water Objective and even beyond the regulatory Maximum Permissible Concentration (of tritium) for water (MPCw). Data suggest a plume of contaminated groundwater has now reached neighbouring Inverhuron Provincial Park.

Slowpoke Reactor

The first commercial Slowpoke reactor was built at Chalk River in 1970 and moved to the University of Toronto in 1971. The Slowpoke was designed as a research reactor for universities and as a heating source for large buildings. There are six Slowpoke reactors installed at Canadian universities. One of the main concerns with the Slowpoke was its usage of highly enriched uranium (93%). This is weapons grade material and could be used to manufacture bombs. Some of the Slowpokes were eventually modified to use a less enriched form of uranium.

Despite the millions of dollars spent designing and developing the Slowpoke, no foreign market for the reactor ever developed. AECL wasted taxpayers money building a reactor nobody wanted.

Gentilly 1 – Quebec

The Gentilly 1 reactor was a complete failure. It operated sporadically for 180 days before it was permanently shut down. It was AECL's only attempt at building a Light Water Reactor. The reactor cost \$120 million to build and taxpayers will be responsible for the eventual costs of decommissioning the reactor and cleaning up the site

Gentilly 2

Gentilly 2 is a CANDU 6 reactor that started producing electricity in Quebec in 1983. It was supposed to cost under \$400 million with a promise from Ottawa to pay half the total costs. Unfortunately, the final cost was \$1.4 billion and Ottawa tried to get away with only paying half the original estimate instead of half the total cost.

The Gentilly 2 reactor has performed relatively well except that it costs more to produce electricity with it than the electricity is sold for. Losses over its lifetime are in the billions of dollars. It is scheduled for refurbishment in 2009.

Point Lepreau

The Point Lepreau reactor is a CANDU 6 model which was started up in 1983.

As with most other CANDU reactors, the Point Lepreau reactor had to be refurbished barely halfway through its expected lifespan. The refurbishment was projected to cost \$1.4 billion and would be completed by September 2009. The project is already four months behind schedule and over budget. The New Brunswick government said that it costs the province a million dollars a day for replacement power for every day the project is behind schedule.

The main cause of the delay is AECL's inability to replace the tubes according to the schedule they laid out. The tools they built for the job have not worked as well as they expected. Further delays were caused when two 107 tonne turbines worth \$10 million each, were dropped off a barge in St. John's Harbour. The turbines were sent back to the manufacturer to see if they could be salvaged.

CANDU 3 and CANDU 9

These reactors were designed by AECL in the 1980s and early 1990s at a cost of hundreds of millions of dollars. Unfortunately, AECL was never able to find buyers for them.

Darlington

The four reactors at Darlington were operational and producing electricity by 1993. They were originally supposed to cost \$4 billion. By the time they were completed five years behind schedule, the cost had risen to more than \$14 billion.

For the most part, the reactors at Darlington have worked quite well. Then again, they are only 16 years old. They are less than halfway through their expected lifespan. It was about this age however, that the Pickering and Bruce Power reactors began to experience severe problems which eventually shut them down until they were refurbished.

The only spill of note I came across at Darlington was on February 15, 1993, when 18,000 litres of heavy water spilled.

History of the Maple Reactors

AECL started building the Maple X-10 reactor in 1990 for MDS Nordion to replace the NRU reactor which had been in operation since 1957 producing medical isotopes for use around the world. After construction was well underway on the Maple X-10, AECL found a major defect that could lead to a loss of coolant accident. In 1993, AECL terminated further development of the Maple X-10 reactor. MDS Nordion started a court action against AECL. According to Natural Resources Canada July 9, 1996: 'In the court action brought forward in October 1993 by Nordion and its parent company, MDS Health Group Limited, a Toronto-based health and life sciences company, the plaintiffs sought \$165 million plus interest, or damages totalling \$300 million. Nordion was privatized by the federal government in 1991.'

'The action was launched after Atomic Energy of Canada Limited cancelled the Maple X-10 reactor project. This reactor was expected to replace isotope production from the NRU research reactor in Chalk River. The Chalk River nuclear facility is Nordion's primary source for medical isotopes.' (NRCan 1996)

As part of the out-of-court settlement reached in 1996, AECL began designing the Maple 1 and Maple 2 reactors. The Maple reactors and the adjacent isotope processing facility were to cost \$140 million. Maple 1 was to be completed in 1999 and Maple 2 was to be finished in 2000. The NRU reactor would be shut down once the Maple reactors began to produce isotopes.

Problems became apparent when they started the reactor. 'As a safety feature, each reactor was designed to have a negative 'power coefficient of reactivity,' or PCR, in which the nuclear reaction in the core decreases as the reactor power increases. Instead, as the reactors were powered up, the exact opposite happened – the reaction in the core increased slightly.' (Ian McLeod, Ottawa Citizen, Aug. 13, 2007)

Several other problems developed with no solution in sight. In 2006, MDS Nordion finally got fed up pouring money (\$393 million to that point) into the reactors and reached a mediated settlement with AECL. MDS Nordion was given \$68 million in cash and an agreement for a 40 year supply of isotopes worth \$344 million. AECL assumed ownership of the reactors and the responsibility for the costs associated with finishing them.

AECL worked on the Maple reactors for two more years but were forced to throw in the towel on May 16, 2008. After 18 years and \$600 million, AECL had to admit that they couldn't get these relatively simple reactors to work. How do they expect to build a full-size reactor?

In addition to the \$600 million spent so far, Canadian taxpayers have to spend another \$80 million to decommission the reactors. On July 9, 2008, MDS Nordion informed the Canadian Government they were starting a legal action to recover \$1.6 billion in compensation for breach of the contract to build the reactors and for the guaranteed supply of isotopes.

MDS Nordion were successful in the two previous settlements with AECL and they probably will be again this time. If their legal challenge is successful, these two little reactors that don't work, will have cost Canadian taxpayers \$2.3 billion, courtesy of AECL's incompetence.

ACR-700 Reactor

AECL's Advanced Candu Reactor was a hybrid reactor combining components of Candu Reactors and Light Water Reactors (LWR). In a November 2, 2004 interview, AECL Technologies President John Polcyn told the Nuclear Energy Institute (NEI) that AECL is spending \$1.5 million each week on the ACR-700, with 380 people working on the design and Canadian licensing. Polcyn said that under the current schedule, the Advanced Candu Reactor-700 (ACR-700) could be certified for US use in 2008.

Polcyn said 'AECL is talking with several sites in Canada, and hopes to begin the two-year environmental assessment (EA) process on the ACR-700 by the end of the year, and have approval of the EA by late 2006 or early 2007.'

AECL submitted the ACR-700 design to the Nuclear Regulatory Commission (NRC) in the United States in 2004 to begin the licensing process. NRC determined the 'coolant void reactivity to be substantially positive in large-break loss-of-coolant accidents (July 1, 2004).' This was disastrous news for AECL as the reactor was designed to have a slightly negative void coefficient of reactivity.

Dr. Gordon Edwards explains: 'This is very important. As of 2004, not only does the US analysis show the reactivity void coefficient is positive, but SUBSTANTIALLY positive. That means if any accident such as a large pipe break were to occur, there will be a surge of power which must be very quickly terminated or the reactor fuel will overheat and rupture, releasing radioactive gases and vapours, and the core could even 'disassemble', setting the stage for a potential meltdown.' (Dr. Gordon Edwards 2007)

AECL abandoned the ACR-700 shortly after. There is no mention on its website that it ever existed. I've requested the design costs for this reactor, but AECL has not responded to date.

ACR-1000 Reactor

AECL is currently designing a new reactor called the ACR-1000. It is similar to AECL's ACR-700 which was discontinued when the U.S. Nuclear Regulatory Commission found its safety features did not work as AECL claimed.

AECL says: 'the 'basic design engineering' is complete, and that AECL is now 'confirming and validating' the safety of the reactor at the Canada Nuclear Safety Commission.' (Globe and Mail November 28, 2008)

The CNSC does not have the expertise to determine if the ACR-1000 reactor is safe. AECL is turning to the CNSC because they couldn't get the ACR-700 through the licensing process with the Nuclear Regulatory Commission in the United States. AECL is hoping the cursory certification provided by the CNSC will allow them to bid on reactors contracts while they try to solve the ACR-1000s design problems.

AECL says there will be subsequent design work needed when a site is selected, but this is not supposed to be the case. These reactors are supposed to be designed to be built on any site to reduce the time required for the regulatory process.

Dr. Frank Greening

The following text on CANDU reactors is part of a submission to the Ontario Power Authority by Dr. Frank Greening. Dr. Greening gives an overview of the problems associated with the CANDU reactors. While they do have some strong points, his analysis reveals the weaknesses of the design which have required massive refurbishment of the reactors halfway through their projected life-spans.

'I am a retired nuclear scientist with 23 years experience working for OPG's Research Division in Toronto. I have spent most of my professional career dealing with technical problems with OPG's fleet of CANDU reactors at Pickering, Bruce and Darlington. I am writing to the OPA to urge our

electricity supply planners not to recommend the refurbishment or construction of any more CANDU reactors to supplement or replace the Province's existing electrical generating capacity. I base this view largely on the poor performance of certain critical systems inherent to the CANDU reactor design'

'When the CANDU reactor was first introduced in the 1960s, particularly in the demonstration Units at Rolphton and Douglas Point, it was proclaimed by AECL to be a reliable and economic means of producing electricity. Eight larger and even more ambitious versions of the basic CANDU design soon followed at the Pickering and Bruce sites. Initial performance of these Units was promising. Indeed, some early CANDU Units led the world in annual average capacity factor, an accepted measure of reactor reliability.'

'Unfortunately, as Ontario's CANDU reactors approached 20 years of operation, serious problems with critical components started to emerge. Pressure tube integrity became a major issue in the 1980s, while steam generator corrosion and annulus gas problems dominated the 1990s. Outlet feeder pipes are the latest CANDU components to suffer from premature failures. Thus, looking at the status of CANDU in the year 2005, we see many of the 22 domestic Units in need of major refurbishments or already abandoned as beyond repair. This situation has arisen within 30 years of the commissioning of most of these Units; worse yet, some Units were shut down for long periods during their lifetime.'

'The hard pill for AECL to swallow is that CANDU's innovative engineering, seen as leading edge in the 1960s, has become its Achilles' heel by the year 2000. This is perhaps not so surprising for 50-year-old technology. After all, many engineering marvels from the 1960s, such as the Space Shuttle and Concorde, have now outlived their usefulness as recent events have so dramatically shown. But, to return to the main thesis of this submission, CANDU was destined to run into difficulties due to the complexity of its design. Corrosion is a well-known concern for all nuclear plant, but when it occurs in essentially inaccessible pipe work, such as the annulus gas system, it presents a problem that is next to impossible to fix.'

'As we have shown, each new problem that developed in CANDU reactors – whether it was leaking pressure tube rolled joints, annulus gas system flow blockages or feeder pipe thinning has required more inspections leading to more outages and higher OM&A costs. The CANDU reactor was always an experimental venture; it has had its successes and was probably a worthwhile undertaking because it added to our understanding of nuclear science and engineering. However, it is time to declare the CANDU experiment over, and move on to something simpler, something proven, something better.' (Dr. F. R. Greening August, 2005)

These are not the words of a nuclear activist or a tree-hugger. These are statements made by a nuclear scientist who worked on CANDU reactors for 23 years.

No one in the world has ordered a CANDU reactor since seven of them were shut down in 1997 only halfway through their expected lifetimes. AECL's track record of designing reactors since then is dismal to say the least. They cancelled the Maple reactors as well as the ACR-700 program because they simply couldn't get the reactors to work. It's time to pull the plug on AECL and quit wasting taxpayers money.

PART 3

Atomic Energy of Canada Limited (AECL)

'Atomic Energy of Canada Limited (AECL), the federal crown corporation that promotes nuclear power, celebrated its 50th anniversary last year (2002). In those fifty years of touting the CANDU nuclear reactor, AECL has soaked up \$17.5-billion in federal government subsidies or an average of \$350,000,000 per year. Over the same period of time the average annual federal support for all renewable energy sources has been less than \$13-million. Imagine for a moment the leadership role Canada could provide, if the same subsidies allocated to the nuclear industry, were directed to renewable energy sources like wind, solar and hydrogen.' (Joe Comartin, NDP, May 12, 2003)

AECL has been a parasite on the Canadian taxpayer since it was created in 1952. AECL has received 27 times the amount of subsidies as all the renewable energy sources put together. Despite not selling a reactor in more than a decade, AECL received \$750 million from Canadian taxpayers in the last two calendar years alone. How long would your company stay in business with this kind of track record?

What Happened to AECL?

Many world class scientists worked for AECL at Chalk River from its founding until the early 1960s. Many of them came from Europe during World War 2 to escape Hitler. They originally started working together with American scientists to develop the first atomic bombs and other experimental reactors. They were world leaders in many areas. Unfortunately this level of excellence has virtually disappeared as evidenced by the 2008 cancellation of the Maple reactor project and the ACR-700 reactor a couple of years earlier.

Frank Greening was a scientist employed by Ontario Power Generation for 23 years who worked on CANDU reactors. Mr. Greening comments on the cancellation of the Maples reactors:

"Back in the halcyon days of the development of nuclear power in the period 1945 to 1965, AECL's research and development facility at Chalk River was universally recognized as a world leader in nuclear engineering, rivaled only by the UKAEA's Harwell Laboratory, and the US nuclear research facility at Oak Ridge. So how could the estimable AECL 'forget' how to design and build something it was quite capable of doing, and doing very well, just 50 years ago?"

Dr. Gordon Edwards weighs in on the same issue:

"The important point is that the brilliant men who designed the NRX and the NRU reactors are no longer to be found at Chalk River. The Europeans have gone home a long time ago. Many of the old-timers have died or retired or gone into other fields. Nuclear power no longer attracts the brightest science students as it once did. In fact AECL has not designed a successful new reactor for over 40 years. That lack of experience, coupled with a certain arrogant form of incompetence, has led to the debacle with the MAPLE reactors." (May 17, 2008, Gordon Edwards)

AECL's legacy of reactor building in Ontario is not one to be proud of. Every reactor they built in Canada was over budget culminating with the Darlington reactors which cost 350% of the original estimate. In addition to the massive cost overruns, the CANDU reactors only lasted half as long as AECL claimed. All of the original reactors had to undergo massive refurbishments after less than 20 years in some cases. The cost of the refurbishments have been greater than the original cost to build the reactors. AECL's incompetence has saddled Canadian taxpayers with a massive debt, the full extent of which will become apparent in a following paper.

AECL's mandate also includes responsibility for the nuclear waste created by the nuclear fuel cycle in Canada. Their track record in this regard is as bad as it is with the reactors. Deline, Port Hope, Serpent River, Chalk River, Whiteshell Nuclear Laboratory and hundreds of millions of tonnes of radioactive mine tailings are the responsibility of Canadian taxpayers and will cost billions of dollars to clean up.

Caught Paying Bribes

There are many instances of AECL not acting in a moral, ethical or legal manner over the years, both in Canada and abroad. AECL paid out over \$22 million in bribes to sell reactors in South Korea and Argentina. An AECL agent was jailed in 1994 for paying a bribe to the head of the South Korean nuclear utility. In total, AECL paid out about \$60 million for bribes and dubious 'agent fees'.

The price that AECL charged for the reactors they sold internationally in the 1990s was greatly discounted from the actual cost of building them. In

addition, much of the financing was supplied by the Canadian government at subsidized interest rates. McLean's summarized the situation best: "If we have to loan people money at subsidized interest rates to buy CANDU at prices below cost and then bribe them to do it, how great is the accomplishment?" (McLean's Magazine)

Heavy Water Plants

The first 'heavy water' plant was built in Trail BC in 1943 with a capacity of 6 tonnes per year. The design of subsequent CANDU reactors required large quantities of heavy water for coolant and moderator. AECL ordered heavy water plants at Glace Bay and Port Hawkesbury Nova Scotia at a cost of \$806 million. Neither plant operated properly, so AECL built another plant at the Bruce Power complex in Ontario and ordered another one in Becancour Quebec.

The two plants in Nova Scotia were shut down in 1985 with the costs being paid by Canadian taxpayers. The La Prade plant in Quebec, built at a cost of \$400 million, was shut down without ever operating. AECL did not need the heavy water as no one wanted to buy CANDU reactors. These three plants, ordered by AECL, were never needed and in total were a waste of \$1.2 billion.

The Bruce Power Heavy Water plant was shut down in 1997. There were many complaints from people living around the facility because hydrogen sulphide was released on a daily basis.

Missing Reactor Part

"Staff working for Atomic Energy of Canada Ltd. lost a metal part they removed from a reactor at the Bruce nuclear power station in April, and didn't tell anyone until an employee from the station found it in June when it triggered the alarm on his radiation monitor. The part was so radioactive that a worker holding the part could have received the entire yearly dose limit in a few minutes. Despite the high level of radiation involved, AECL is not required by law to report the lost part to the Canadian Nuclear Safety Commission." (Martin Mittelstaedt, The Globe And Mail Saturday, July 26, 2008) Atomic Energy of Canada Limited did not inform Bruce Power or the Canadian Nuclear Safety Commission that the part had been lost. It is quite telling to hear the comments on the matter from different people involved with it. The Canadian Nuclear Safety Commission was not impressed that the loss of the radioactive part was kept secret. They wanted a full report from Bruce Power on how the loss occurred and why it was kept quiet. Atomic Energy of Canada Limited admitted they were wrong in not reporting the incident and expressed remorse.

Frank Greening, a nuclear scientist and consultant with more than three decades of industry experience, equated the incident to a doctor leaving a scalpel inside a patient, knowing about it, but taking two months before saying anything about it.

"They seem to have a habit of not reporting stuff, then they have to talk their way out of it when it finally is reported," Greening said. "There's a bit of a pattern here of sloppy bookkeeping and reporting." (Tyler Hamilton, Toronto Star)

This is not an isolated incident, but rather the way that Atomic Energy of Canada Limited conducts its affairs. There are numerous examples where they have not reported significant issues to the regulator and the public. There are other instances where they have lied to the Canadian Nuclear Safety Commission on regulatory issues which could pose harm to people and the environment. It is telling to note that the Canadian Nuclear Safety Commission, Atomic Energy of Canada Limited and independent scientists all admit this was a serious breach of regulatory protocol while the head of Bruce Power tried to play it down. According to Tyler Hamilton of the Toronto Star:

"Duncan Hawthorne, chief executive officer of Bruce Power, dismissed the seriousness of the incident when contacted by the Star. "It's not a story," he said. "It's a bull--- story. There is no issue."

The question is: How many other incidents go unreported at Bruce Power because Duncan Hawthorne considers them bulls**t? We have many examples of occurrences at the Pickering reactors, Cameco's operations, Bruce Power and at Chalk River that were not reported to the regulators or the public in a timely manner, if at all. Considering the number of events we find out about after the fact, how many remain hidden from the regulator and the public?

Falsified Data

We are increasingly finding out about dangerous situations and the lack of regulatory oversight from people within the nuclear industry who are concerned for the health of people and the environment. The following account is an example of Atomic Energy of Canada Limited trying to deceive the nuclear regulators. Though we have come to expect this behaviour from them, it is discouraging to hear that someone in a university is conspiring with them in this deception. The following account by Dr. Frank Greening is very disturbing.

"I worked for 23 years as a research scientist for the large nuclear electric utility OPG and became involved in the study of hydrogen embrittlement of zirconium pressure tubes. This was a major problem and concern for AECL, the designer of the CANDU reactor. AECL needed to explain to our nuclear regulator why so much hydrogen was entering the pressure tubes in the 500 MW Units at Pickering. AECL proposed a THEORY that made no sense to me. I spent 5 years studying real samples of highly radioactive tubing and found lots of evidence that AECL's theory was plain WRONG! I presented my results at a number of meetings and was essentially shouted down. I did more research and found to my horror that one of my colleagues was cooking up data at a well-known Canadian University to support the dubious AECL theory. I approached a post-doc at the University who I could trust and together we checked the computer code being used to generate the data and found the steps in the program where the 'fudging' was being covertly carried out. I tried to expose this deception and was blocked at every turn. I was barred from speaking to or corresponding with zirconium experts at ASTM who had published the fudged data. I was barred from submitting an article, correcting the fudged data, to a journal. I was threatened with a lawsuit by a professor even though I had a letter from the same professor admitting that data had been falsified. After battling 'the system' for 5 years I took early retirement out of frustration and disgust with the state of science in industry and academia here in Canada." (Dr. Frank Greening) How many other times has this scenario played itself out where the employee said nothing? Most people don't have the courage to come forward.

Pinawa

Dave Taylor, a member of Concerned Citizens of Manitoba, gave the Seaborne Inquiry a sense of contamination of the environment at Whiteshell Nuclear Laboratories in Pinawa Manitoba caused by AECL. As a result of correspondence he received from AECL, Mr. Taylor told the Inquiry that AECL had buried 2500 containers of radioactive waste in unlined earth trenches between 1965 and the late 1970s in their waste management areas. The disconcerting part of his presentation was AECL's admission that they didn't know whether it was safer to leave the containers there or remove them. How can the public feel any confidence in nuclear energy if the federal corporation responsible for nuclear reactors and the waste they create does not know the preferred method of dealing with radioactive waste.

Recent Reactor Leaks

- On January 27, 2009, AECL reported a leak of tritiated water that occurred on December 5, 2008. When the leak first occurred, AECL reported to the CNSC and the Prime Minister's office that they had an 'unanticipated maintenance issue'. They never explained the true severity of the accident to anyone. AECL admits they don't know what caused the leak. The 800 litre leak released radioactive tritium into the air.
- On January 27, 2009, AECL also reported an ongoing leak in a weld at the reactor that is leaking 7000 litres of slightly radioactive water per day.

Most of this water ends up in the Ottawa River. They plan on fixing the weld once the reactor is shut down. Unfortunately, they have to keep producing isotopes because the other old isotope reactor in Europe is shut down. The 52 year-old NRU reactor is working 'double-time' to produce 70% of the global demand for medical isotopes.

• On February 22, 2009, AECL officials reported that 11 kg of heavy water was vented from the NRU reactor after two tiny pin holes were found in a pipe Sunday morning. As usual, Michael Binder, the CEO of the CNSC stated: "There was never any danger to the public or the environment." However, Dr. Gordon Edwards strongly disagrees with the CNSC's assessment of the situation. Dr. Edwards states: "What is described as a 'small' leak of heavy water is actually a rather large discharge of radioactive tritium, into the environment. The heavy water steam that escaped into the atmosphere on December 5, 2008, included about four-and-a-half trillion becquerels of tritium. The steam that was 'vented' on February 22 included about 11 trillion becquerels of tritium. Meanwhile, about 28 trillion becquerels of tritium in liquid form is being slowly released into the Ottawa River, the source of drinking water for millions of people.

Yet the regulatory agency says this is of 'no concern' and that there is 'no risk' to the health and safety of Canadians or the environment. Such a statement is scientifically indefensible. There is no safe threshold level for any carcinogenic substance, and the number of cancers caused by such exposures is directly proportional to the number of people so exposed. When they (CNSC) say that their policy is to keep all exposures to radiation 'as low as reasonably achievable', they obviously don't take that policy very seriously." (Gordon Edwards, February 24, 2009)

Medical Isotopes

AECL applied to the CNSC in 2005 to extend the license to operate the 48 year-old NRU reactor to produce medical isotopes because of their inability to complete the Maple reactors. The CNSC attached seven conditions to their license including the requirement for the installation of a back-up power source to the coolant pumps. During a scheduled maintenance shutdown of the NRU reactor in November 2007, the CNSC became aware that AECL had never installed the power source. CNSC president Linda Keen issued an order preventing the restart of the reactor until the parts were installed. This shutdown would take up to a month as AECL did not have the required equipment in Canada.

In December 2007, the global supply of medical isotopes was disrupted when the CNSC forced AECL to keep the NRU reactor shut down until upgrades stipulated in their operating license were installed. Natural Resources Minister Gary Lunn over-reacted and fired CNSC president Linda Keen and Prime Minister Harper ordered the immediate restart of the NRU reactor. The entire episode reminded you of a routine by the 'Keystone Kops'. The government tried to downplay the significance of the event but CNSC president Linda Keen set the record straight when she told Parliament:

"The commission had serious concerns regarding the safety of this 50-year-old nuclear reactor when its licence was ready to expire. When the commission considered the licence renewal application in the spring of 2006, it seriously questioned the safety of this NRU. Its decision, effective August 1, 2006, to grant this new licence was based on specific assurances by AECL that its safety case was complete and that the seven key safety upgrades were completed. That assurance turned out to be false."

A subsequent report by independent consultants into the matter stated that both AECL and the CNSC ignored standard operating procedures and that the communications between the two organizations were so bad that AECL did not make the required upgrades and the CNSC did not inspect to ensure that the work had been carried out. The report revealed that CNSC staffers were aware that AECL had not fixed the problem, yet they never told their superiors.

Assistance to Weapons Programs

As previously stated, Canada supplied the United States with uranium to build the first atomic bombs for the Manhattan Project. Canada continued to supply uranium for the United States nuclear weapons program into the 1970s courtesy of AECL. Virtually all production from all the Canadian uranium mines was used for this purpose.

AECL sold/gave India a version of the NRX reactor called the CIRUS reactor. It started operations in 1960 and produced the plutonium India used to create their nuclear weapons program. Though Canada has never developed a nuclear bomb, it has been a key player in the development of the nuclear arsenal of several countries.

Cameco in Port Hope continued to produce depleted uranium munitions into this decade for the American government at their facility in Port Hope. Cameco and Eldorado before them supplied the American nuclear weapons program with the raw materials they required to manufacture atomic and depleted uranium munitions.

Exposure to Atomic Testing

The January 2007 Report for Defense Minister Gordon O'Connor states that 689 Canadian Armed Forces personnel were exposed to atomic weapons tests by the United States and England. The report was commissioned as a response to a group of Veterans who are pressing for compensation for the radiation-induced illnesses they have suffered. No individuals who took part in the tests were contacted for the report.

The study by Ottawa-based nuclear weapons specialist John Clearwater does not attempt to determine how many of the veterans became ill as a result of their exposure. But it does note that the levels of protection the men used were at times questionable and some personnel were "exposed to radioactive contamination on the testing grounds where they had to live, sometimes for months at a time." (David Pugliese, The Ottawa Citizen, June 18, 2007)

The following account of a Canadian soldier's experience is from a Sun Media article written by Bill Kaufman:

"It (the atomic bomb) went off one kilometre away - the trenches caved in on us. There was stuff smoldering around us and some of the Americans had to be dug out."

Mr. Kaufman continues:

"Shortly after the explosion, the soldiers were packed into helicopters and flown over the bomb site - through the fringes of a maelstrom of radiation. There is little doubt that the Canadian Government sent these soldiers to the test site to be exposed to as much radiation as possible. None of the soldiers were told why they were being sent to Nevada."

The Canadian Government never followed up on the health effects to the soldiers. Our Veterans are still fighting Ottawa for compensation for risking their lives and their health. After 51 years, the Canadian Government is stalling the compensation in the hope that most of the veterans will be dead soon. By comparison, the U.S. government has a program that awards a \$76,000 payment to nuclear veterans who have had cancer.

Robert Henderson, who was part of a radiation monitoring team during five nuclear blasts, said the veterans are dying off as they wait in vain for compensation promised to them by the Harper government:

"I think they're stalling because out of the 1,000 or so people involved there's only about 100 or so living," said the 76-year-old from High River, Alta.

"We thought this government was going to do something, but it's getting worse rather than better."

"Jim Huntley, another of the atomic veterans, said lawyers for the Justice and Defence departments will likely spend more money fighting the old soldiers in court than the government would have to pay out in compensation." (David Pugliese, The Ottawa Citizen, April 5, 2008)

The Canadian government knew the dangers these soldiers would face from exposure to radiation near the bomb blasts, yet they never warned them in any way. Further, the Canadian government has never carried out any type of health testing on any of the people who were affected. It is beyond belief

that our government could treat its citizens in such a cavalier and irresponsible manner.

Summary

There are many other examples throughout the papers you will receive of AECL's incompetence and outright corruption. They have saddled Canadian taxpayers with massive future debts as well as the potential for catastrophic debts from a severe nuclear accident. AECL has prevented Canadians from knowing the full scope of the costs by preventing Canadians from accessing the requisite documents. AECL will not release documentation and files on people's homes in Port Hope and other communities which are built on radioactive waste. There is no reason to keep these documents secret. They have no impact on national security. The only impact they will have is to prove that AECL has been remiss in protecting Canadians.

AECL continues to promote itself as a world leader in the nuclear movement but the rest of the world does not seem to agree with it. They are unable to sell the flawed reactors they build and they are unable to design the reactors they contract to build. They were one of the pre-eminent nuclear designers in the world at one time but they have been reduced to a very expensive side-show.

The final word in this section on AECL goes to former Ontario Power Generation (OPG) scientist Frank Greening who states:

"Having worked for OPG from 1978 to 2000 I can attest to Ron Osborne's (OPG President) identification of poor management as the root cause of the declining performance of OPG's nuclear division during the late 1990s. I have also had direct experience with AECL management at Chalk River and I can confirm that it is both arrogant and incompetent - a deadly mixture indeed!

PART 4

Nuclear Costs to Date

"Nuclear is the single biggest business disaster in the history of the world. No other technology has failed so big, so often, and so spectacularly. No other technology has needed so much help from so many governments over so long a period of a time. Because of its sorry record, almost all developed nations decades ago scrapped their nuclear-expansion plans." (National Post, March 8, 2008, Lawrence Solomon)

The costs associated with Canada's 65 year nuclear history have been staggering. There are no figures available from the Canadian government on the total costs to date nor have all the bills been paid yet. Suffice it to say that our children and grandchildren will be paying for it throughout their lives; with their wallets, their quality of life and their health.

The damage caused by the nuclear industry goes well beyond simple dollars and cents; the costs to our health and the environment are much harder to put a price tag on. We must also factor in the 'lost opportunity costs' resulting from Canada directing the majority of energy related subsidies to the nuclear industry. Consequently, Canada lags behind the other industrialized nations in the development and deployment of renewable energy.

Atomic Energy of Canada Limited (AECL)

AECL is the crown corporation in charge of developing and selling nuclear reactors for the Canadian government. They are also responsible for radioactive waste management. Canadian taxpayers have given AECL over \$20 billion in direct subsidies since their inception in 1952. This amount is just the 'tip of the iceberg' that AECL has cost Canadian taxpayers. AECL's history of incompetence culminated with the 2008 cancellation of the Maple reactors 18 years after they started.

Cost Overruns from Reactor Construction

The last reactors built in Canada were at Darlington, 40 minutes east of Toronto. The four Darlington reactors were not completed until 1993 at a cost of \$14.5 billion or more than \$10 billion over budget. By 1998, the cost overruns from the 20 reactors in Ontario were the major contributor to Ontario Hydro's \$35 billion debt. The utility was bankrupt and split into five separate components. The Canadian government forgave \$20 billion of Ontario Hydro's debt (all Canadians are paying this bill) and Ontario electricity users are paying the balance with a surcharge on their electricity bills.

The public was in for one more shock before the dust settled on Ontario Hydro. The utility was mandated to set aside a portion of their revenue from the time the reactors were built in order to decommission them when they were shut down. It was revealed that the utility had put the funds directly into general revenue instead; there was no money set aside for decommissioning. It is unclear at this time whether this will become the responsibility of Ontario taxpayers or if the pain will be shared by all Canadians.

Refurbishments

AECL's claim that the CANDU reactors would last for 40 years had no basis in fact. The first CANDU reactor was shut down in 1983 at Pickering A after 12 years of service for re-tubing. All four of the Pickering A reactors were re-tubed over the following 10 years. In 1997, all four Pickering A and three of Bruce Power's reactors were shut down for accumulated safety problems and lack of reliability.

In 1999, Ontario Power Generation estimated it would cost \$1.1 billion dollars and take three years to get all four Pickering A reactors back in service. Work commenced in 1999 to bring Unit 4 of Pickering 'A' back into service at a cost of \$457 million. According to the Report of the Pickering 'A' Review Panel:

"In late September 2003, the first of four Pickering 'A' reactors returned to service. Compared with the plan approved by the Board of Directors of Ontario Power Generation (OPG) in August 1999, the cost of Unit 4's return to service had almost tripled, and the return to service date has slipped by more than two years."

The cost to repair Unit 4 was \$800 million dollars over budget and two years late. They spent more money fixing one reactor than the original estimate for all four reactors. OPG went ahead and fixed Unit 1 at a cost of \$1 billion. Due to the delays and massive cost overruns of the first two reactors, OPG decided to permanently shut down Units 3 & 4.

Spending all this money on the reactors did little to improve their performance. In the summer of 2007, Units 1 & 4 were shut down for further repairs along with one other reactor from Pickering B. Combined with the two reactors on permanent shutdown, only three of the eight reactors were generating electricity all summer.

By 2005, Bruce Power restarted reactors 3 and 4 at a cost of \$720 million, which was more than double their initial estimate of \$340 million. They have since announced plans to refurbish four reactors by 2013 at a cost of \$5.2 billion. They started working on the first two reactors in 2007. This part of the project was supposed to cost \$2.5 billion but it is already 25% over budget.

In 2008, Hydro-Quebec announced plans to refurbish Gentilly 2 at a cost of \$1.9 billion. This was \$700 million more than the estimate when the project was first proposed in 2004.

In February 2009, AECL was given a \$100 million subsidy to address cost overruns for refurbishments at Bruce Power and Point Lepreau. This came only two weeks after AECL was given \$350 million dollars by the Canadian government as announced in the January 27, 2009 budget.

Cost of Replacement Electricity

Bruce Power had to shut down reactor 6 for three months in the summer of 2002 because an accident had caused holes in the pressure and calandria

tubes. As the summer is the 'peak load' time of year, Ontario was forced to buy replacement power at a cost as high as \$2 per kilowatt hour instead of the normal domestic price of five cents per kilowatt hour.

It would cost \$1.6 million per hour (at \$2 per kilowatt hour) to replace the electricity from the 800 megawatt reactor 6 during peak demand instead of the normal price of \$40,000. Assuming two hours per day of 'peak load' purchases for the duration of the three-month shutdown, Ontario would have paid \$288 million for replacement electricity instead of \$7.2 million at domestic rates.

The problem was worsened because of the other reactors at Bruce Power and Pickering that were on permanent or temporary shutdown. Ontario had a shortfall of up to 4000 megawatt hours of electricity during peak demand that summer which would cost \$8 million per hour at \$2 per kilowatt hour. It would only take 125 hours at this rate to burn up a billion dollars. To make matters worse, the replacement power they bought was from coal-fired generators, the dirtiest energy source of all.

"In New Brunswick, the provincial government has said it will incur \$90- million in additional costs to replace the power lost as a result of delays in \$1.4-billion project at the Point Lepreau reactor, the first Candu 6 that AECL has undertaken to refurbish." (The Globe And Mail, Friday, February 13, 2009, By: Shawn McCarthy)

Decommissioning

The Canadian taxpayer will also be responsible for most of the costs of decommissioning the reactors and other nuclear facilities. There are no Canadian cost estimates available but the British Government's National Audit Office released a report on January 30, 2008 stating it will cost 73 billion pounds (\$140 billion Cdn.) to decommission Britain's reactors and nuclear sites. Canada has a similar number of reactors and contaminated sites. Taxpayers will have to foot the bill to remediate the abandoned uranium mines in Canada whose owners simply walked away. Many other mines simply dumped their radioactive tailings in the closest lake. These radioactive tailings ponds are contaminating downstream environments. In most cases, the tailings ponds are contained with simple earthen dams. There have been more than 30 breaches of the earthen dams at Elliot Lake since they were first put in place.

Radioactive Waste

The Canadian Government's estimate of projected cleanup costs has no basis in reality. They have allocated \$240 million to clean up 3.5 million cubic metres of radioactive waste in Port Hope. By contrast, the Americans spent \$4.4 billion on a similar sized, but far less complicated cleanup at the Fernald site in Ohio.

Radioactive tailings from the 12 mines in Elliot Lake were dumped into ten lakes. All the lakes are dead and leaching contaminants into the watershed all the way to Lake Huron. The Serpent River watershed has been destroyed. There is no cost estimate to fix this disaster.

It will cost another \$25 billion to dispose of spent reactor fuel currently being stored at reactor sites and probably \$25 billion more to clean up Chalk River, Pinawa, Port Hope and other contaminated towns and mine sites.

Cost of a Nuclear Accident

The news gets much worse if there is a nuclear accident or terrorist attack. According to the U.S. Nuclear Regulatory Commission (1982), a major accident at a U.S. nuclear reactor could cost as much as \$500 billion (in 1982 dollars or \$1.1 trillion dollars in 2007) in damages while a severe nuclear waste transportation accident could cost as much as \$271 billion (\$610 billion in 2007).

For comparison, there was more than \$350 billion in damages from Chernobyl in 1986 (\$666 billion in 2007 dollars) and this was in a rural setting. What would the cost be from a major accident at a Pickering reactor which is sitting on Toronto's border with four million people?

Affected Area of Accident

A major reactor accident could contaminate more than 10,000 square miles of land. This is equivalent to the land from Valleyview to Peace River all the way to the B.C. border. 'Branding the Peace' would take on a whole new meaning in the event of a major reactor accident at Lac Cardinal.

Russia's Chief Public Health Official and member of the Russian Academy of Medical Sciences Gennady Onishchenko stated:

"Some 4,343 towns and villages in 14 Russian regions with the total population of 1.4 million lie within the radioactive contamination zone 20 years after the Chernobyl nuclear accident." (Tass)

"Up to 359 Welsh farms are still operating under restrictions imposed in the wake of Chernobyl, more than two decades after the Soviet nuclear plant went into meltdown. The Food Standards Agency Wales revealed the figure before today's 22nd anniversary of the largest nuclear accident in history. Upland farms in Wales were caught out by unfortunate circumstances in the wake of the disaster. Heavy rain washed radioactive material from clouds onto fields. The radiation is absorbed from the soil by plants, which are then eaten by sheep." (April 26, 2008 by Darren Devine, Western Mail)

What would the economic impact be if a large part of the Peace River region was contaminated from a nuclear accident? What is the yearly value of agriculture, the oil and gas industry and tourism? What will it cost to move 100,000 people to new homes? What hardships will these people face having to start over?

Liability Insurance

I was told I would need \$3 million in liability insurance to rent a table at the mall to sell my book. A friend was told he would need \$3 million in liability insurance to sell his turned wooden bowls at the fall fair. My 18 year-old Toyota pick-up had \$2 million in liability insurance.

I can understand the need for this much coverage on a vehicle because of the potential costs involved in a large accident or the possibility of personal injury. But I can't figure out what could possibly happen while my friend and I sat at tables selling bowls and books that could cost us \$3 million.

I gave these examples to put the level of liability insurance required by some of the nuclear fuel cycle facilities into perspective. Cameco's Uranium Conversion facility in Port Hope is situated in the middle of town and in the middle of the harbour on Lake Ontario. Cameco processes large quantities of very dangerous industrial chemicals and radioactive substances; 4-6 million pounds of uranium on site at any given time. Cameco has \$4 million in liability insurance on that facility.

Zircatec manufactures fuel rods for nuclear reactors in the middle of a residential area. They also use large quantities of very dangerous substances including beryllium and enriched uranium. Zircatec is only required to have \$3 million in liability insurance in place.

It is absurd that these facilities are only required to have the same level of liability insurance as I need to sit at a table in the mall. No business in any other industrial sector can operate with this low level of insurance.

Insurance Subsidies

No insurance company in the world will insure the nuclear industry nor will they provide homeowner coverage in the event of a nuclear accident. Take a look at your homeowner policy and you'll see that there is no coverage if your home is impacted by a nuclear accident. As such, the Canadian government implemented the Nuclear Liability Act in 1976 to protect the nuclear industry.

The Nuclear Liabilities Act limited nuclear operators to \$75 million in liabilities in the event of an accident. Bill C-5 has since been introduced to raise

this limit to \$650 million in the event of a large nuclear accident. The balance of the damages is the responsibility of Canadian taxpayers. This amounts to a massive subsidy to the nuclear industry and absolves them of any responsibility for an accident. No other industry is allowed to operate in this manner.

Though \$650 million sounds like a lot of money, It represents only one seventeenth of one per cent of the potential \$1.1 trillion damages caused by a nuclear accident. In other words, if your \$250,000 house was rendered uninhabitable, the nuclear company would only be required to pay you \$148. The other \$249,852 would be paid by Canadian taxpayers, if the federal government decides to pay at all. An accident of this magnitude would almost triple Canada's national debt in one day.

The Nuclear Liabilities Act also prevents legal action against the suppliers of components to the nuclear reactors even if there were flaws and deficiencies. There is no incentive for the owners and suppliers to build the best facility possible because they are protected from prosecution.

On May 6, 2008, Member of Parliament Dennis Bevington (Western Arctic, NDP) rose in the House and spoke of his concerns about the Nuclear Liabilities Act. Mr. Bevington said:

"Mr. Speaker, I want to rise and question my honourable colleague on one issue that he referred to. He said that this bill appears to be what the industry needs."

"The concern that we in the New Democratic Party have is not only what the industry needs but what the citizens of Canada need. What do they need from a nuclear liability act? What do they need that will protect them and ensure that when there is such a calamity in this country that the compensation is done in a fair, open and prompt fashion and that the amounts that are geared to be put forward are adequate. How does the bill guarantee the rights of Canadians in receiving the kind of compensation that could be applicable in the event of a nuclear catastrophe?"

The simple answer is that there is no guarantee Canadians will receive fair compensation as it will be at the discretion of the federal government. As we have seen for the past 65 years, Canadian citizens always take second place to the needs and best interests of the nuclear industry. As evidence, the Veterans who were exposed to atomic weapons tests are still waiting for compensation after 52 years.

Nuclear Subsidies

The nuclear industry has never been able to operate without being heavily subsidized by governments. The current attempt to build nuclear reactors is no different than the last one. The 'pigs are already lining up at the subsidy trough'.

Jerry Grandey, president and chief executive officer of Saskatoon-based Cameco Corp., was the first out of the gate after subsidies in a July 1, 2008 article in the Globe and Mail. Mr. Grandey complained that the Canadian government has fallen behind the Americans in providing incentives (read subsidies) to encourage the growth of the nuclear industry. Mr. Grandey obviously wants more reactors built as the company he runs is the largest supplier of uranium in the world.

Atomic Energy of Canada Limited (AECL) and their partner, SNC-Lavalin are asking the Canadian government to provide loan guarantees at reduced rates to try to make their bid to build Ontario's reactors more attractive. AECL is also asking the government to cover cost overruns for the reactors they want to build. The Canadian taxpayer is already on the hook for any cost overruns for the refurbishment of the Point Lepreau and Bruce Power reactors. In 2007, the federal and Alberta governments both stated their opposition to subsidies. Natural Resources Minister Gary Lunn said:

"The federal government will not go so far as subsidizing or providing a financial backstop for any AECL projects. We don't intend to do that. We've made that very clear". (June 24, 2007, Edmonton Sun, Alan Findlay)

Alberta Energy Minister Mel Knight was against subsidizing the cost of building the reactors in Alberta. Mr. Knight "vowed that his province would not be putting public money at risk. This is a market decision. The risk is borne by investors." (Edmonton Sun, June 24, 2007, Alan Findlay)

Minister Lunn refuses to speak about specific requests for subsidies from AECL and SNC-Lavalin but he did say his ministry would be there to support their bid. Time will tell.

Other Examples of Subsidies

"Most recently, Ontario's Auditor General found that provincial price guarantees granted to the privately owned Bruce Power so it would embark on a \$4.25 billion refurbishment of two units were found to be overpriced." (Edmonton Sun, June 24, 2007, Alan Findlay)

"When subsidies are factored in, such as a rent reduction for Bruce Power and the government paying for Bruce's uranium fuel, the consortium is guaranteed between 6.3 and 7.1 cents per kilowatt hour for its electricity, McCarter concluded. That's well above the 4.9 cents average for the past five years and significantly above what private-sector experts believe the future price of electricity will be, he added." (National Post, March 15, 2008, Lawrence Solomon)

Externalized Costs

Some air pollutants in Ontario increased over 40% in 1997 when 7 nuclear reactors were shut down for poor performance and safety concerns. This increased the strain on already limited health resources in the province and surrounding jurisdictions.

Ontario lost its AAA credit rating because of the collapse of Ontario Hydro which made the cost of borrowing money more expensive.

The following is from Ontario Power Generation's (OPG) Report dealing with the cost overruns on the refurbishment of the Pickering reactors:

"These facts are alarming, but they are not the only price paid. The delay in the return to service of Pickering A has adversely affected Ontario's electricity sector and pushed up prices for residential and business consumers. The costs and delays of the project have also reduced OPG's revenues, capital resources and corporate value. But, perhaps most seriously, faith has been compromised in the affordability and certainty of the supply of electricity vital to Ontario's citizens and businesses." (Report of the Pickering 'A' Review Panel, December 2003)

"Two of the four reactors at the Bruce 'A' nuclear station have been restarted by the lessee, Bruce Power — but only at the cost of a sweetheart contract that relieves the private consortium of responsibility for radioactive waste and reactor decommissioning." (David Martin, Greenpeace)

Future Reactors

A recent statement by Canadian Treasury Board President Vic Toews to the Globe and Mail should be of great concern to Canadian taxpayers.

"He (Vic Toews) said any new reactor sale will require Ottawa to backstop not only the construction risks, but potential cost overruns when the reactors have to be refurbished." (The Globe And Mail, Friday, February 13, 2009, By: Shawn McCarthy)

The Canadian government plans to expand the nuclear industry on the backs of Canadians. They have little choice as the nuclear industry still can't pay its own way after fifty years of trying.

Who Pays the Bills?

I've asked the audience in presentations I've made in Northern Alberta during the past year if they're aware they've been subsidizing electricity for people in Ontario. I've yet to see a hand go up but I have seen a lot of scowls appear on faces. Albertans aren't very happy when they find out they've been paying for something they get no benefit from; nor would people from any other province or territory.

Twenty of the twenty two power reactors in Canada provide electricity to Ontario residents. Canada's nuclear laboratory is located at Chalk River

Ontario. AECL and the CNSC are both based in Ontario. Virtually all of the 30,000 nuclear related jobs outside the uranium mining industry are located in Ontario. In short, Ontario receives all the economic advantages that are available from the nuclear industry. Yet it is Canadian taxpayers from all parts of the country who've been paying the bills for the past fifty years. All Canadians will pay:

- \$20 billion in subsidies to AECL.
- \$20 billion of Ontario Hydro's debt forgiven by Canada.
- Cost overruns for refurbishments (AECL has the contracts).
- Radioactive waste cleanup at all sites.
- \$680 million for failed Maple reactors plus pending \$1.6 billion court action against AECL.
- Future cost overruns from reactor construction and refurbishments.
- 99.95% of the costs of a major nuclear accident.
- Costs of potential court action for damage to people's health and property devaluation.

When everything is taken into consideration, it is plain to see that all Canadians are paying the bills and assuming the risk for nuclear electricity and 30,000 jobs, all for the benefit of Ontario. Not Fair. All Canadians must become aware of the issues in the nuclear debate and step up to the plate. If not, our children and grandchildren will be paying our nuclear bills throughout their lives.

Further Research

Energy Probe and Greenpeace have compiled lists of nuclear costs you may want to refer to.

There's an excellent paper titled: The Economic Cost of Nuclear Power by Richard Lance Christie from November 2007.

PART 5

Health Studies

"There are so many former Navajo uranium miners now in their 70s and 80s who have uranium-related cancer that the Navajo Nation has a permanent office in Shiprock to take applications for those who qualify under Congress' Radiation Compensation Exposure Act. Congress passed the act in 1990 because the U.S. government failed to tell the miners decades before that the 'yellow cake' could eventually kill them. Those who qualify by having certain cancers are paid \$100,000, to make up for a life time of radiation exposure." (Jim Snyder, The Daily Times)

The United States government admitted 20 years ago that thousands of their citizens were negatively impacted by their exposure to radiation. Their Radiation Compensation and Exposure Act was enacted to provide compensation to those who were affected. Canada is now alone among the nuclear powers in not admitting the harm they have caused their citizens. The recent spate of health studies from other parts of the world are destroying the credibility of Canada's position that there is no danger from our exposure to the nuclear fuel cycle.

Health studies on uranium miners, nuclear energy workers, people living near the facilities as well as the comprehensive reports on radiation from international scientific bodies are leaving no doubt of the negative impact to health that is caused by exposure to radiation from the full spectrum of radioactive isotopes.

According to NIRS (Nuclear Information and Resource Service):

"The National Academies of Science released an over-700-page report yesterday on the risks from ionizing radiation. The BEIR VII or seventh Biological Effects of Ionizing Radiation report on 'Health Risks from Exposure to Low Levels of Ionizing Radiation' reconfirmed the previous knowledge that there is no safe level of exposure to radiation—that even very low doses can cause cancer. Risks from low dose radiation are equal or greater than previously thought. The committee reviewed some additional ways that radiation causes damage to cells. The report also found that: Even exposure to background radiation causes some cancers. Additional exposures cause additional risks.

Radiation causes other health effects such as heart disease and stroke, and further study is needed to predict the doses that result in these non-cancer health effects.

It is possible that children born to parents that have been exposed to radiation could be affected by those exposures." (NIRS, Washington, DC July 30, 2005)

The following are some of the radiation-related health studies conducted in Canada and around the world. They leave no doubt about the health impacts of exposure to radiation in all parts of the nuclear fuel cycle. In the face of these findings, Canada and the nuclear regulators will have to change their approach to protecting Canadians.

Canada vs. United States

The biggest and most obvious flaw in the health studies conducted in Canada by the government and the nuclear industry is that they are not testing for all the radiation induced illnesses and conditions.

If you look at the chart below, you will see that Canada only recognizes four conditions that can be caused by exposure to radiation while the United States government lists 36 of them.

Conditions recognized in law in the United States as associated with radiation exposure:

1. leukemia, lymphoid (except chronic lymphatic leukemia)
2. leukemia, myeloid
3. leukemia, monocytic
4. leukemia, hairy cell
5. leukemia, other
6. leukemia, unspecified cell type
7. thyroid cancer
8. breast cancer
9. lung cancer (trachea, bronchus and lung)
10. bone cancer
11. liver cancer, primary
12. skin cancer
13. esophageal cancer
14. stomach cancer
15. colon cancer
16. pancreatic cancer
17. kidney cancer
18. urinary bladder cancer

19. salivary gland cancer
20. multiple myeloma
21. posterior subcapsular cataracts
22. non-malignant thyroid nodular disease
23. ovarian cancer
24. parathyroid adenoma
25. malignant tumours, brain and central nervous system
26. lymphomas other than hodgkins disease
27. cancer, rectum
28. cancer, small intestine
29. cancer, pharynx
30. cancer, bile duct
31. cancer, gall bladder
32. cancer, renal pelves, ureters, urethra
33. cancer, prostate
34. bronchio-alveolar carcinoma
35. benign neoplasms, brain and central nervous system
36. other malignancies not listed in the preceding diagnoses

Conditions recognized by Health Canada as associated with radiation exposure:

1. leukemia
2. lung cancer
3. breast cancer
4. thyroid cancer

Why does the Government of Canada recognize only leukemia, lung, breast and thyroid as sentinel cancers associated with ionizing radiation when the United States Dept. of Justice recognizes 36?

The health studies commissioned by the Canadian government, Health Canada and the nuclear regulators all share this weakness.

Health Studies on Miners

The Canadian Government was first warned about the dangers faced by uranium miners in 1932 by experts in Canada's Department of Mines. Canada was advised of the dangers many times over the next fifty years but no warning was ever issued to a miner. As the owner of the first uranium mines and conversion facilities, Canada didn't want to increase the cost of production by having to supply safety equipment to the miners and other nuclear workers. The following are some of the studies carried out on uranium miners.

A 1979 pilot study on miners at Port Radium showed that 10 of the 76 miners who had worked there for more than five years died of lung cancer between 1953-1979. A second study on Port Radium miners was conducted in 1987 by Howe, Nair, Newcombe, Miller, Burch and Abbott. They reported 57 lung cancer deaths among 2,103 miners or 2.4 times the expected rate.

"In 1942, Wilhelm C. Hueper, the founding director of the environmental cancer section of the U.S. National Cancer Institute reviewed 300 years of radon data on European miners. His conclusion: radon gas in cobalt mines routinely produced lung cancers that systematically killed more than half of all miners 10 to 20 years after their employment." (Andrew Nikiforuk, 1998)

The Ontario Miners' Study in 1995 conducted by the Ontario Ministry of Labour identified 152 lung cancer deaths among 21,346 miners or 2.3 times the expected rate.

Former miners at Elliot Lake were making one claim per week on average 10 years after the mine closed. They all had lung cancer and other radiation related illnesses.

The health study from Shiprock, New Mexico found congenital deformities were 83% higher among the miners families than the reference group that was tested.

The American Journal of Epidemiology conducted a study on employees from Atomic Energy of Canada Limited in 1988. From 1950 to 1980, there were 946 deaths out of 13,570 employees.

The Beaverlodge Miners Study conducted by the American Journal of Epidemiology identified 65 lung cancer deaths among 8,487 miners or two times the expected rate.

Jadugoda, India Uranium Mines Study

This is the largest and most thorough study ever carried out on people who are affected by the mining of uranium. The study group was made up of 9,511 people living in five villages within 5 kilometres of the uranium mines in India. The reference group consisted of 8,490 people from 14 villages at least 25 kilometres away from the mines. The study found:

27% more people died before reaching the age 62 in the villages within 5 kilometres of the uranium mines than in the villages more than 25 kilometres away.

Cancer was the primary cause of death in 52% more people in the villages within five kilometres of the uranium mines.

4.49 % of births in the study area had congenital deformities as compared to 2.49% in the reference group or an 84% increase.

Couples living in the study villages in proximity to the mines are 58% more vulnerable to primary sterility than those living more than 25 kilometres away.

Port Hope Studies by Health Canada

Health Canada conducted 'indicator' health studies in Port Hope in 1998 and 2000. The studies were intended to pinpoint the direction that should be taken for comprehensive health studies. These limited studies gave the following results.

- 13% more deaths than expected in Port Hope from 1986-1997.
- 48% elevation over expected rates for all childhood cancer deaths.
- 41% elevation in incidence of leukemia for children over the 26 year period of the incidence study.
- 38% higher number of deaths from colorectal cancer in women than expected in the 1986-1996 time period.
- Lung cancer was elevated for men and women in different time periods with female rates significantly elevated during the 1986-1996 time period.
- Brain cancers in females are more than 2 times the expected rate in the 1986-1997 time period and are significantly elevated for the 26 year study period.

- Almost 50% excess of brain cancers in children over the 42 year study period with the time period 1971-1985 showing more than 4 times the expected number of brain cancers in children.
- Non-Hodgkins lymphoma statistically significantly elevated in children for the entire time period.
- Nasal cancer incidence rate is significantly high for males. Most notably in the 1971-1985 period with rates 5 times higher than expected.
- Esophageal cancer rates are twice the expected rate for men from 1971-1985. Women have a 50% excess for the entire period.
- Rarer cancers such as lip/nose and sinuses/bone showed statistically significantly elevated incidence rates for men in at least one time period.
- 15% of excess circulatory disease deaths which amounts to over 300 excess deaths (more than 7 per year) during the 42 year period.
- Female circulatory disease rates rose dramatically from the period 1976-1985 to 1986-1997 and 100 more female deaths than expected were due to this cause.

Health Canada stated that none of the results above are 'significant' and have refused to do further studies as they have promised since 1978.

Dr. Rosalie Bertell did not equivocate in her assessment of the results released by Health Canada:

"Health Canada's claim of 'no problem' to area residents from 70 years of exposure is fraudulent and not supported by the data presented in the report." (Dr. Rosalie Bertell)

In February 2004, Dr. Eric Mintz, Epidemiologist, did an independent analysis of the data in the two Health Canada/CNSC reports. He identifies significant trends for Port Hope which were not considered important by CNSC staff. Dr. Mintz stated:

"The patterns of several cancer rates show cause for concern in that the patterns are consistent with environmental contamination and certainly the raised leukemia rates, which were even higher before remediation, are not reassuring. Along with the brain cancer, colon cancer and some of the rare cancer results, the available evidence points to there being problems in Port Hope." (Dr. Eric Mintz 2004)

Durham Region Report

The 'Radiation and Health in Durham Region Report 2007 (RHDRR 2007)' is reference by Ontario Power Generation (OPG) to justify their assertion that the Pickering B reactors are not negatively impacting the health of residents in the community. Dr. Rosalie Bertell analyzed the report shortly after its release. Some of her comments are:

- RHDRR 2007 is an ecological study. This is the weakest design of all types of health studies now available to health researchers. The outcome of a study is pre-determined by the study design and methodology. They used the poorest choices available.
- The Durham Health Department eliminated without justification, consideration of pancreatic cancer (the fifth most common), cardio-vascular disease, and teratogenic (initiated while in utero) diseases or malformation, known to be caused by exposure to ionizing radiation.
- The Durham Health Department has failed to become current on the literature documenting the human genetic effects of exposure to ionizing radiation. Moreover, it does not have the right to declare cancer the only health effect of radiation which is "of concern" to the public.
- RHDRR 2007 tried to minimize the international study of atomic workers in 15 countries, and failed to inform the public that CANDU workers had shown more excess cancers than those working in other nuclear reactor types.

German Leukemia Study

The German study, carried out by the epidemiologist Professor Joerg Michaelis, found leukemia rates among children living within five kilometres (3 miles) of nuclear power stations was 117% higher than the general population. Overall cancer rates among children were 60% higher. The study looked at statistics from between 1980 and 2003 in regions near 21 reactors or former reactors.

According to Heinz Juergen-Peters:

"After the study was published the German Environment Minister ordered the government's Radiation Protection Commission to review it. A committee of twelve external independent experts found out that the study is methodologically accurate. In fact, they said the study was flawless. It should be noted that other experts also considered the study to be exemplary, as it was well-designed and carefully conducted." (Physicians for Global Survival)

The study was conducted on the instruction of the German Environment Ministry. It is telling to note however, that the "German environment minister, Angela Merkel, announced in November 1997 (before the study was released) that according to a large-scale leukemia study there was no higher risk of leukemia for children living close to nuclear power plants. A few weeks later, however, it was discovered that the minister and the professor had tried to deceive the public." (485.4811 Wise Amsterdam)

The release of the study proved the environment minister, a nuclear supporter, was not telling the truth.

Childhood Leukemia Near Reactors

The following information was put out in a press release by Joseph Mangano on Nov. 11, 2008:

"Leukemia death rates in children near nuclear reactors in the United States rose sharply in the past two decades, according to a recent study by epidemiologist Joseph Mangano and toxicologist Janette Sherman.

The greatest mortality increases occurred near the oldest nuclear plants, while declines were observed near plants that closed permanently in the 1980s and 1990s.

PART 6

Allowable Levels of Radiation

"What was not monitored was radiation from internal emitters which may have been breathed or swallowed or made their way into the body through any opening in the skin. These internal emitters of radiation, even at the single particle level, can and do cause the onset of disease."

(John Clearwater, 2007 Report on Veterans Exposed to Atomic Testing in Canada)

Allowable Doesn't Mean Safe

There is no safe level of radiation. It's that simple. The presence of any radioactive material increases the risk of disease. If this material is lodged inside your body, the risk is much greater. Radioactive material inside your body is called 'internal emitters.' Internal emitters will be bombarding the cells next to it with radiation as they decay to another radioactive substance.

Canada's regulatory regime for radiation emissions is based solely on doses received to the outside of the body. They do not take the far greater impact of the internal emitters into consideration.

ALARA Principle (As Low As Reasonably Achievable)

The Canadian Nuclear Safety Commission (CNSC) regulates allowable levels of radiation in Canada according to the ALARA Principle. The level of

emergency preparedness involving the nuclear industry is also regulated according to the ALARA Principle.

Although it refers to the ICRP Risk Model at times, the Canadian Government uses the ALARA Principle to set the allowable levels of radiation in Canada. Each nuclear facility in Canada determines its own allowable level of radiation based on what it feels is 'reasonably achievable.' As such, the allowable levels of radiation in Canada are set to ensure the profitability of the nuclear company instead of being set to protect the health of people living near the facilities.

In 2005 the Municipality of Port Hope realized their fire department could not fight radiological fires and there was no warning system in place nor evacuation plan. The CNSC allowed Cameco to operate in the middle of town without required emergency protection. In response to Cameco's application to start processing enriched uranium in Port Hope, the town's Chief Administrative Officer (CAO) voiced his concerns:

The Municipality should not rely solely on ALARA (As Low As Reasonably Achievable), the CNSC safety philosophy for off-site matters. Rather the Municipality should be proactive and require state of the art safety and response measures with respect to matters within its own jurisdiction. (Port Hope CAO, Mike Rostetter, Report to Council, 2005)

The ALARA Principle makes a mockery out of Human Rights. Its use must be discontinued and replaced with the Precautionary Principle.

Tritium

Tritium is a radioactive form of hydrogen released to air and water by nuclear reactors. It has weak penetrating properties, but once inside the body, it is very dangerous. It can enter our bodies through ingestion, inhalation or directly through the skin. It is especially dangerous to pregnant women as it can cross the placenta to the baby.

Many people living near nuclear reactors are concerned about the level of tritium in their drinking water. The health authorities in the Federal Government tell them not to worry as testing shows tritium to be below allowable limits. This is true most of the time; the emissions from these facilities are within allowable levels.

However, when you compare the allowable level for tritium in drinking water in Canada to other countries, you do not feel safe. The allowable level of tritium in the European union is 100Bq/L while the United States sets a limit of 740Bq/L. The Canadian standard is 7000Bq/L. This is not a misprint Canada's limit must be set this high because the CANDU reactors release 30 times as much tritium to the environment as any other reactor in the world. This is because CANDU reactors use heavy water as both moderator and coolant. Refer to the 'Tritium Hazard Report By Dr. Ian Fairlie June 2007' for further information.

In 1994, the Ontario government appointed Advisory Committee on Environmental Standards recommended that the maximum permissible concentration of tritium in drinking water be immediately reduced 70 fold to 100 Bq/L, and gradually dropped to 20 Bq/L over 5 years. Their recommendations were contained in a report called 'A Standard for Tritium: A Recommendation to the Minister of the Environment and Energy.' The recommendations were rejected.

Radon Gas

Radon gas is the second leading cause of lung cancer in Canada. It is responsible for about 2000 deaths per year. Health Canada is currently in the process of setting new radon gas exposure levels in Canada. Health Canada released the 'Report of the Radon Working Group on a New Radon Guideline for Canada.' The Working Group's first recommendation is:

Remedial measures should be undertaken in a dwelling whenever the average annual radon concentration exceeds 200 Bq/m³ in the normal occupancy area.

This an attempt by Health Canada to raise the remediation criteria for a second time on properties that have been contaminated by the nuclear industry and the Canadian Government since elevated radon levels were discovered throughout Port Hope in 1975.

In 1975, the allowable level for radon in a building in Ontario was 3pCi/L or 111Bq/m³ (metric equivalent) and it fell under the jurisdiction of the Ontario Government. Many properties in Port Hope at that time tested above 3pCi/L, including St. Mary's elementary School at 63 pCi/L.

The Federal and Provincial Governments realized they had a large problem on their hands so they formed the Federal Provincial Task Force on Radioactivity (FPTFR): "to coordinate a national program of radioactive contamination assessment and remedial measures. The primary clean-up criteria for radon daughter products, is 20 Milli Working Levels (150 Bq/m³ radon equivalent)." (Atomic Energy Control Board, Info Bulletin 77-2) Instead of cleaning up the sites which had tested above the allowable level, they simply raised the allowable level 33%.

As previously stated, Health Canada's proposed recommended remediation criteria is 200Bq/m³ or 5.4pCi/L. In other words, they have raised the remediation level for radon by 35% over the Federal Provincial Task Force on Radioactivity criteria or 80% since the contamination was first discovered in Port Hope in 1975. This will allow the government to avoid cleaning up potentially hundreds of buildings in Port Hope.

The 80% increase in the recommended remediation criteria is very troubling considering the U.S. Environmental Protection Agency, Health Canada, the U.S. National Academy of Sciences and the World Health Organization all say that there is no safe level of radon

Most U.S. Environmental Protection Agency (EPA) lifetime safety standards for carcinogens are established based on a one in 100,000 risk of death.

Most scientists agree that the risk of death for radon at 4 pCi/L, is approximately one in 100. At the 4 pCi/L EPA action guideline level, radon carries approximately 1000 times the risk of death as any other EPA carcinogen.

The EPA and the Surgeons General's Office have urged widespread testing for radon. They estimate a family whose home has radon levels of 4 pCi/L is exposed to approximately 35 times as much radiation as the U.S. Nuclear Regulatory Commission allows if they were standing next to the fence of a radioactive waste site.

Neutron Radiation

In December 2004, a group of people from different organizations measured a variety of sites around Port Hope with a scintillation counter (High tech Geiger counter). Several public sites we measured had radon levels more than 50 times higher than the allowable level. We went to Cameco's public parking lot to measure their trucks with full UF₆ containers on board. We were shocked to find out the containers were giving off neutron radiation.

"Neutrons readily pass through most material, but interact enough to cause biological damage. Due to the high kinetic energy of neutrons, this radiation is considered to be the most severe and dangerous radiation available. Another, sometimes more severe, hazard of neutron radiation is neutron activation, the ability of neutron radiation to induce radioactivity in most substances it encounters, including the body tissues of the workers themselves." (Wikipedia)

There are no regulations in place in Canada limiting the levels of neutron radiation we are exposed to. Cameco and the Canadian Nuclear Safety Commission never told Port Hope residents or nuclear workers about the presence of neutron radiation.

Beryllium

Zircotec Industries (fuel rod manufacturer) in Port Hope used beryllium in fuel rods as a neutron generator (called 'booster fuel') and as part of the welding process. There is no regulatory level for particulate beryllium in Canada, though some companies use the OSHA Standards from the United States.

Beryllium disease erodes the lungs, making it hard for a victim to even walk across a room without severe pain and exhaustion, and usually results in a slow, painful death by suffocation.

Beryllium disease is not limited to workers. 'Neighbourhood cases' of the disease were first documented in the 1940s when ten people who lived within a mile of the Brush Inc. plant were exposed to smokestack emissions of the toxic dust were diagnosed with beryllium disease. In 1948, the first of many cases among workers' wives was diagnosed. These women were exposed to the toxic metal dust while washing their husband's work clothes.

Increased Risk to Women and Children

"Children are more sensitive to radiation than adults because they are growing more rapidly, there are more cells dividing and a greater opportunity for radiation to disrupt the process. Fetuses are also highly sensitive to radiation." (The U.S. Environmental Protection Agency)

"The incubation time for cancer is five to 50 years following exposure to radiation. It is important to note that children, old people and immuno-compromised individuals are many times more sensitive to the malignant effects of radiation than other people." (Dr. Helen Caldicott, The Australian, April 15, 2005)

"The same radiation in the first year of life for boys produces 3 to 4 times the cancer risk as exposure between the ages of 20-50. Female infants have almost double the risk as male infants." (BEIR 7 Report, Biological Effects of Ionizing Radiation)

"Cancer mortality risks for women are 37% higher than for men. The risk for lung, breast, kidney and liver tumours are 50% greater in women." (BEIR 7 Report)

Children face a much larger risk from radon gas than adults because the heavy weight of radon gas forces it closer to the floor where the small children spend most of their time.

Different Rules for the Nuclear Industry

Port Hope residents discovered a broken pipe in 2008, dumping water contaminated with uranium and arsenic directly into Lake Ontario. The pipe is owned by Cameco Corporation and it drains treated water from the Welcome Radioactive Waste Management site.

The residents had the effluent tested by Caduceon Environmental Laboratories in Peterborough Ontario. The report showed very high levels of arsenic and uranium found in the samples, but far more disturbing was the report showed three different allowable levels in place in Ontario for both arsenic and uranium; the Ontario Water Quality Objectives, the Canadian Drinking Water Guidelines and the Canadian Nuclear Safety Commission's allowable level for Cameco's license.

For arsenic, the province of Ontario allows up to .005mg/L, the Canadian government allows up to .01mg/L and the CNSC allows up to .5mg/L. The CNSC allows Cameco to discharge 100 times more arsenic than the province of Ontario does. The level of arsenic found in the test sample was .02mg/L or four times as high as the provincial standard.

For uranium, the province of Ontario allows .005mg/L, the Canadian government allows .02mg/L while the CNSC does not have an upper limit in place. Cameco's license allows them to dump as much uranium as they want into Lake Ontario from this pipe. The level of uranium found in the test sample was .246mg/L or 49 times higher than the level allowed by the Province of Ontario.

There are allowable levels of radiation in place in Canada but they are not the same from one place to the next. For example, the allowable level of gamma radiation at Cameco's fence-line in Port Hope is six times higher than the allowable level at the fence-line of the nuclear reactors 12 miles away at Darlington. Cameco's facility is heavily contaminated from processing radioactive material for 75 years and the vast amount of radioactive material they handle prevents them from reducing gamma radiation levels to those found around the reactors.

Modelling

Over 90% of all substances released from Cameco to the air and water in Port Hope are modeled on a computer. There is hardly any real-time measurement of the contaminants coming from their uranium processing plant. Computer modeling can tell them what should be coming out of their stacks and other sources (points of impingement) but it does not tell them what is being released. There is no way for the modelling program to tell if an accidental release has occurred.

There is no independent monitoring of Cameco or Zircatec's emissions to confirm the results of the modeling exercise. The Ontario Government was responsible for ensuring the accuracy of Cameco's reported emissions but they pulled out and cancelled all involvement several years ago.

The Cluff Lake Mine Environmental Assessment made extensive use of modeling. In his petition to the Auditor General on June 25, 2004, W.R. Adamson states: "In many instances, Cogema had not done recent field testing but took prior tests, some of them from the initial proposal for a licence, and simply projected them with computer modeling! Nature is a dynamic, changing, interrelated organism and does not go simply by computer numbering! Nature includes a lot of surprises!"

Environmental Assessments of sensitive and populated places are increasingly relying on modelling programs to prove the merits of a project. Modelling should be a secondary tool in assessments to confirm the findings of real-time measurement and observation.

Internal vs. External Emitters

The regulatory levels of radiation in Canada are concerned only with radiation exposures outside our bodies or external emitters.

Science has shown that radioactive material inside our bodies (internal emitters) is far more dangerous than on the outside. The reason for this is that when a radioactive particle lodges in a part of our body, it continually bombards the cells closest to it with radiation as it decays. This constant bombardment can cause disease, death or mutations in those cells.

Change Allowable Levels

In March of 2000, levels of tritium in groundwater at Bruce Power exceeded their operating limits because of undetermined leakage. This came at a bad time for Bruce Power as they were applying for a license renewal. The nuclear regulator solved the problem for them by making a 'special provision' to increase the operating limit by 500%. By December 2001, test results from groundwater monitoring wells had exceeded even the new levels enacted by the nuclear regulator.

Last Word

The regulatory levels in Canada concerning radiation exposure have been put in place to protect the nuclear industry and the Canadian Government. The CNSC's usage of the ALARA Principle to set allowable levels must be terminated as it provides no health protection. It is absurd that an industry as dangerous as nuclear is essentially allowed to regulate itself by determining what it can afford to spend to protect Canadian citizens.

If they can't afford to protect us, get rid of the industry.

PART 7

Cameco (Eldorado Nuclear)

"Last July's (2007) discovery of a small amount of loose yellow uranium in the soil under Cameco's uranium hexafluoride (UF6) conversion plant (in Port Hope) has added a disturbing and alarming chapter to the ongoing and ever-changing contamination saga. At a Canadian Nuclear Safety Commission (CNSC) meeting earlier this week in Ajax, company officials revealed the leak from the UF6 plant has reached the harbour. To put this revelation into perspective, it is critical to note the saga opened as a near-the-surface, on-site contamination issue isolated to the north-east quadrant of the UF6 plant. Then one contamination plume grew to two, surface contamination was upgraded to groundwater contamination and the contamination travelled from nowhere near the fence line, to close to the fence line, then beyond the fence line and into the employee parking lot." (Port Hope Evening Guide Editorial, 2008)

Cameco, and Eldorado before them, have contaminated Port Hope's air, water, soil and people with radioactive, chemical and heavy metal waste and emissions since the radium extraction facility was located there in 1932. Port Hope has had a longer and more intense exposure to a variety of radioactive materials than any community on Earth.

Eldorado Nuclear Ltd. was a company wholly owned by the Canadian Government. In 1988, Eldorado Nuclear and the Saskatchewan Mining Company were amalgamated and privatized to form Cameco. Despite the name change, it is still the same company, with the same disregard for human health and the environment. Eldorado was responsible for more radioactively contaminated sites and people in Canada than all other nuclear companies combined.

Port Hope Harbour

The Ganaraska River in Port Hope is internationally renowned for the salmon and trout that spawn in it. Port Hope had one of the most beautiful natural harbours on Lake Ontario. Today, the harbour is a toxic cesspool and an embarrassment to the community. It has been designated as one of the 43 most contaminated sites on both sides of the Great Lakes. The Cameco Uranium Conversion facility is located in the middle of the harbour in Port Hope.

The harbour has been used as a dumping area and settling pond by Cameco and Eldorado since Canada started supplying uranium for the American nuclear weapons program in 1943. The cooling water outflow and the stormwater drains from the uranium facility both empty into it. This is the reason "the harbour is 25 times as contaminated as the tailings pile at a uranium mine" according to the study released by the Canadian Government in 1981.

The Canadian Government was aware of the negative effects of discharging heated water and contaminants into the Yacht Basin more than 30 years ago. The 1976 Eldorado Nuclear Limited document titled 'Evaluation of Potential Sites for a New Uranium Refinery in Ontario' states: "It was assumed that the thermal discharge and potential waste streams from the facility would have a negative impact on commercial and recreation fisheries close to the site. These effects will be long term in nature."

Lake Ontario Waterkeepers presented evidence at the 2005 CNSC hearings that Cameco's discharge to Lake Ontario was harmful to rainbow trout. There were 15,000 rainbow trout in the local fishery when the UF6 plant was built in 1986. Today, there are fewer than 4000 fish.

Welcome Radioactive Waste Storage Site

Eldorado Nuclear started dumping radioactive waste on the highest point of land just north of Port Hope in 1950 in the town of Welcome. Shortly after contaminated material was placed in the dump, cattle started dying in the area. The farmers traced the creeks running through their properties back to the Welcome Radioactive Waste Storage. Radioactive, chemical and heavy metal contaminants were leaching out of the waste piles and running untreated into the creeks the animals were drinking from.

The people living near the waste storage site didn't fare much better than the cattle. Three members of one family (Austins) died from leukemia. No doctor had ever heard of three members of one family dying from leukemia before.

Waste Pipeline to Lake Ontario

To rectify the problem, the Canadian government built a pipeline in 1956 to carry the offending material from the Welcome storage site to Lake Ontario. This 'bluish green' cocktail of contaminants was dumped untreated into Lake Ontario until 1978. Many places along the pipeline became contaminated as leaks developed over the years.

Though some of the leachate at the Welcome site is treated, Cameco is allowed to dump unlimited amounts of uranium into Lake Ontario by the Canadian Nuclear Safety Commission. This fact came to light when Port Hope residents discovered the pipeline broken at the shore of Lake Ontario. Families Against Radiation Exposure (FARE) from Port Hope stated on their website: "Everything Cameco told the public about its broken pipe from Welcome turned out to be a lie. They said it wasn't broken. And they said "things are working like they should," even after water tests done by Lakeshore Road residents showed high levels of uranium and arsenic pumping into Lake Ontario."

FARE continues: "After three months of Cameco denials that anything was wrong, the company has been ordered to clean up its act by the Canadian Nuclear Safety Commission. It must repair its broken pipe immediately. And it must upgrade its water treatment equipment at the Welcome Waste Management Facility – to "control the release of nuclear and hazardous substances ... into the environment," a CNSC letter informed Cameco vice-president Andrew Oliver on Oct. 17, 2008."

The letter said "the environmental protection measures in place at the facility do not conform to modern standards and expectations."

The down-side to having the pipe extended back into Lake Ontario is that residents can no longer test for high levels of contaminants.

Joanna Young

Joanna Young's husband started working at Eldorado (Cameco) in Port Hope in 1954. Shortly after he started work, he was sent to tear down some ductwork which, unknown to him was full of radioactive material. When the ducting fell, the material inside covered his body. He started getting sick shortly after and within a year, he was dead. His wife Joanna, now a single mother with 5 kids to feed, tried to get compensation for the loss of her husband. Her ordeal lasted for 42 years before she was paid.

The Atomic Energy Control Board, the Workers Compensation Board and both iterations of the company did everything they could to prevent admitting that her husband died from his exposure to radiation.

Port Granby

The Canadian government also started dumping radioactive waste on a property at Port Granby, just west of Port Hope. The Port Granby Waste Storage site didn't cause as much harm to the land around Port Hope as it was located directly beside Lake Ontario. The leachate from the radioactive and heavy metal waste simply ran directly into Lake Ontario.

Cattle broke through the fence into the Port Granby site and were found dead on the site the next day, possibly from the thorium stored there. Neither Cameco nor the Canadian government have ever revealed the full range of radioactive materials stored at Port Granby.

Foundation Problems in UF6 Building

On July 20, 2007, Cameco announced it was shutting down its uranium hexafluoride building because they found contamination under concrete slabs they removed. Cameco hid this information from the public for an entire week despite rumours going around town. The Port Hope Evening Guide contacted Cameco and were told nothing was going on.

It was revealed during the subsequent investigation that Cameco's employees had been telling management since 1993 that the pits in the floor of the building were being used for the wrong chemicals and substances, but Cameco never listened to them.

Cameco removed the top two feet of soil underneath the UF6 plant. They said: "they could not go deeper than two feet, even though there is contamination below that, because it starts to threaten the stability of the building," said Cameco spokesman, Dr. Andy Oliver.

This is simply not true if previous information provided by Cameco is to be believed. The foundation for the building in question is pilings extending all the way to bedrock, about 50 feet down. The contaminated material can be excavated from one area at a time without threatening the integrity of the building. The only reason Cameco doesn't want to do it is that it will cost a lot of money to clean up and dispose of that much contaminated material. When I first became aware of the foundation problems in 2006, I contacted Mark Peacock from the Gananaska Region Conservation Authority to find out about the soil composition under Cameco's buildings. Mr. Peacock made it clear to me that the material under the UF6 is very granular (beach sand) which would allow for an accelerated flow rate of contaminants. The contamination may have migrated all the way to bedrock.

The following is the rest of the editorial from the Port Hope Evening Guide that opened this chapter on the need for a proper cleanup of Cameco's site. "When questioned back in August 2007 whether it was possible for the contamination to make its way into Lake Ontario, the company's (Cameco) fuel services vice-president replied, "It's not going to happen."

"Well, guess what — it has happened. There are trace amounts of arsenic and uranium reaching the water; however, company officials say the quantities are not enough to be a risk and water tests have not changed."

"The time has come for Cameco and the CNSC to tackle this issue head-on, not in dribs and drabs, putting out fires as new investigations reveal more problems at the aging site. The time has also come to quit making a distinction between historic Eldorado Nuclear contamination and contamination from Cameco Corporation operations. Does it really make any difference what entity is responsible for the contamination that is finding its way into the lake? It's unlikely the plants and fish, both big and small, make any distinction on the source of the contamination. Bottom line, this must be stopped now."

"Another alarming revelation this week was the depth of soil excavated from under the UF6 building. When questioned whether removal of two feet of soil had rid the site of all its contamination, the company admitted there is still contamination below, but removing more would threaten the stability of the UF6 plant. Instead, the company installed a new concrete floor over the contamination, complete with chemical-resistant coating."

"This answer is unacceptable. If there is more contamination under the building then tear it down and get it all now, not 30 years from now when the site is decommissioned. Surely some of the millions Cameco is expected to spend on its Vision 2010 plan to clean up and enhance its lakefront facility might be better spent on ensuring all the contamination under the UF6 plant is removed."

"The CNSC is the federal authority charged with protecting Canadians and the environment from any harm that could stem from nuclear-related activities. Do your job." (Editorial, Port Hope Evening Guide, 2008)

Harbour Contamination UF6 Building

The 'little spill' Cameco originally reported in the UF6 building continued to grow until they had to finally admit that uranium and arsenic were leaking into Lake Ontario.

"The CNSC tribunal heard there are actually two plumes of contaminated groundwater coming from the UF6 plant - one heading east and another heading south and then turning east. The plume that edges along the harbour contains arsenic as well as uranium. The contamination could have been going on for 10 to 20 years. It's been since Cameco took over the plant. In other words it's been on your watch." (Dr. Christopher Barnes, CNSC Commissioner)

"The leak from Cameco's uranium hexafluoride (UF6) plant has reached the harbour, federal nuclear regulators were told on May 14, in Ajax. "If this has been going on for decades it could have been contaminating the harbour and who knows what else," said Dr. Christopher Barnes, a Canadian Nuclear Safety Commission (CNSC) tribunal member." (Northumberland News, Jennifer O'Meara - May 15, 2008)

Cameco satisfied the CNSC cleanup requirements by agreeing to remove the top two feet of soil inside the UF6 building. This is despite the fact that Cameco admitted the contamination goes much deeper. In which case, uranium and arsenic will continue to seep into Lake Ontario.

Harbour Contamination UO2 Building

Cameco told Port Hope Council on Dec. 16 that a leak was found November 4, 2008 under the UO2 (uranium dioxide) plant allowing uranium and arsenic to enter Lake Ontario. Cameco General Manager, Andy Thorne told Council: "This leak has been contributing to the historical and recent contamination of the soils at Cameco's Port Hope Conversion Facility. A yellow stain led to the discovery of the leak under the main sump near the eastern wall of the UO2 building and on Nov. 5, excavation took place to remove 17.5 cubic metres of contaminated soil." (Northumberland Today Dec. 17, 2008)

Why did Cameco wait six weeks to inform the public about the problem? This was the third leak of uranium and arsenic into Lake Ontario that Cameco reported in less than six months. Both of their main production buildings and their waste disposal site are contaminating Port Hope's harbour. What will it take for the CNSC to realize this facility has to be shut down to protect Port Hope residents and the environment they live in.

Faulty Fuel Rods

3000 fuel rods were quarantined at Bruce Power in 2008 while an investigation was carried out to find the cause of faulty fuel rods. The two possible reasons given for the damage are both troubling. If water was leaking onto the fuel rods at Zircatec (owned by Cameco), a potential for a criticality accident exists depending on the enrichment level of uranium. If it was a case of the wrong uranium being inserted into the fuel rod, the potential would exist for damage to the reactor core. Either scenario could have caused a major accident.

Fluorine Spill

On January 20, 2009, Cameco informed Port Hope Council that they vented fluorine into the environment on September 27, 2008, as a result of a gasket failure in their uranium hexafluoride plant in Port Hope. "The September monthly air test results exceeded the Ministry of the Environment limit. The hydrogen fluoride levels in the air went almost as high as 114 grams of hydrogen fluoride per hour."

"Fluorine is the most reactive and electronegative of all elements. It is a pale yellow, corrosive gas, which reacts with most organic and inorganic substances. Fluorine and its compounds are used in producing uranium." (January 22, 2009, Port Hope Evening Guide)

The four-month delay in reporting contamination prevented community members and environmental groups from doing independent testing to find out the true scope of the spill.

McArthur River Uranium Mine

On April 6, 2003, Cameco's McArthur River uranium mine suffered a cave-in and flood of radioactive water. The miners who were sent in to try to save the mine worked without respirators or radiation suits for the first 48 hours.

According to Bill Good, one of the first miners sent in: "the mine's radiation alarm kept going off, but the radiation technician merely re-set the alarm,

assuring them that everything was fine. He'd just go over and turn it off, and on. And then it would go green and then ten minutes later it would be red again." The alarm normally turns red when radon levels rise above 1pCi/L. However, radon levels in the first 48 hours went as high as 44 pCi/L. "According to Keewatin Visions, a miners' group, CNSC staff were at the mine site within a few days of the event, but they did not go underground. The Canadian Nuclear Safety Commission intervened after 48 hours of work, and told Cameco they would have to protect their workers. Miners wearing the protective gear continued to work on the mine for months, and by July 2003, the mine was back in business." (Jamie Kneen, Mining Watch) "Cameco representatives admitted that consultants' reports had warned of the possibility of a cave-in and major 'inflow' and that they had inadequate pumping and water treatment capacity and no contingency plans. They also admitted that their internal geology and engineering used non-standard methodology and therefore couldn't be analysed and compared to standard mine practice. Cameco's excuse is that they had mined in the danger zone before, and they thought they could continue without taking precautions like installing extra pumping capacity or preventive measures like freezing the ore before drilling into it." (Jamie Kneen, Mining Watch) System Improvements Inc. a consultant hired by Cameco, stated: "If effective ground support had been in place on April 6, 2003, the ground would not have failed and the water inflow could not have occurred." The report also said that Cameco had been repeatedly warned by their Chief geologist, the mine superintendent and contract workers about the potential dangers from water hazards right up until the accident happened.

Cigar Lake

During the nuclear regulators' December hearing, nuclear commission member Christopher Barnes, a geologist, admonished Cameco officials for the Cigar Lake accident. "My concern is that you're developing a mine here without adequate geologic, geotechnical, hydrogeologic knowledge; and when events like this one—or the one at McArthur River—take place, they put workers in considerable jeopardy," he said. Barnes also criticized company officials three years earlier during a hearing on the McArthur River accident. "When you put the pieces together, they build a story of really fundamental issues about the competence of the company," he said in April 2003. Another flood at Cigar Lake in April 2006 knocked out a secondary shaft that remains underwater. A company report on the accident that was due in February hasn't been filed with regulators yet. The setbacks are prompting Canadian regulators to question Cameco's ability to master the daunting geology of northern Saskatchewan's uranium-rich, water-laden Athabasca Basin.

Wyoming Uranium Mine

Cameco's Smith-Highland Ranch uranium mine in Wyoming was issued Notice of Violations by Wyoming's Department of Environmental Quality (DEQ) for what they state is "an alarming number of environmental violations" including delayed restoration of groundwater, about 80 spills containing uranium, radium and selenium, and a seriously inadequate bond to cover restoration. The DEQ report concluded that: "the mine routinely extends production times for some well fields. 'Well Field C', for example, was in production for 10 years instead of the planned one to three years. Underground water restoration is supposed to occur simultaneously with ongoing production, but that rarely happens at the mine, according to the report. Production and restoration time frames have doubled and tripled, yet the mine still proposes to bring additional well fields into production." (Dustin Bleizeffer, Star-Tribune, April 4, 2008) DEQ Director John Cora said: "it was an anonymous tip that prompted then DEQ land quality administrator Rick Chancellor to conduct an investigation of the Smith-Highland Ranch uranium mine. It was unfortunate that it took a high-level investigation to bring the alleged scope of violations at the Smith-Highland Ranch mine to light." (Dustin Bleizeffer, Star-Tribune, April 4, 2008)

Uranium Mine, Crawford Nebraska

Cameco, which owns an In Situ Leach (ISL) mine near Crawford Nebraska, have again been accused of contaminating drinking water sources with Arsenic, Radium, Thorium, and heavy metals due to the mixing of the mined water with community groundwater. ISL mines owned by Cameco have already been convicted and fined for causing major spills and permit violations in Wyoming (\$1.4 million) and Nebraska (\$100,000) ISL uranium mining involves massive pumping of oxygenated water into aquifers to dissolve and strip uranium from sandstone particles at the bottom of the aquifer. The process removes most of the uranium and then pumps toxic water back into the aquifer where it can mix with drinking water aquifers, rivers and streams. The mined water is then stored above ground in evaporation ponds or dumped into a deep disposal well under the drinking water aquifer. "Plaintiffs said that threats to public health and safety exist due to the faults and fractures that link the mining site and drinking water aquifers and that the license application is missing key information, such as the fact that the Crow Butte mine is wholly-owned by a Canadian corporation and that foreign ownership of the mine is not allowed by the Atomic Energy Act of 1954." (Alex White Plume, Dec.3, 2008) "Here at Pine Ridge, we have widespread Arsenic contamination and a rate of diabetes 800 times the national average, so it is clear to me that we have to continue to fight to make the water safe for our children and grandchildren." (Alex White Plume, Dec.3, 2008)

Kumtor Operating Company

Kumtor is a wholly owned subsidiary of Canada's Cameco Corp. that has been operating the Kumtor Mine in Kyrgyzstan since 1997. The mine and Cameco have been under attack because of a series of accidents and spills that have caused harm to people and the environment. The mine is located at 4000 metres elevation, on permafrost, in an earthquake zone. On May 20, 1998, a truck from the mine spilled two tons of cyanide into the Barskoon River. Up to four people died, 2,600 people sought treatment for rashes, sores and other ailments, and more than 1,000 were hospitalized. Cameco refused to release its emergency response plan to scrutiny. Kumtor did not report the Barskoon incident for several hours which allowed the cyanide to flow far downstream. If the company had acted quickly, fewer people would have been sickened and hospitalized. Subsequent impact studies have shown that the mortality and morbidity rates in the Barskoon area have risen dramatically compared with previous years. The spill also caused economic losses from contaminated produce and the decline in tourism at Lake Issyk Kul. The Kumtor mine was also the site of a 70 litre spill of nitric acid in July 1998 and in January 2000, a mine truck dumped 1.65 tons of ammonium nitrate. On July 8, 2002, a local man died at the mine when a 200 metre high pit wall collapsed and buried him. Local citizens and environmental groups are concerned about further accidents and damage to the environment due to the unstable region the mine is located in and the mine's poor safety record. "Local civic and international environmental groups have long pressed the company to open access to the mine and publicly release key documents, including its emergency response plans, environmental and safety monitoring data, studies on the impact of mine tailings on local streams and rivers, and its plans for cleaning up the site when production was expected to end around 2008." "It is in that context that the July 8 accident has again raised concerns. The mine wall collapse means there could be something very wrong with [the company's] geological studies around the mine. And if that's the case, what else is wrong? If the tailings dam [where the cyanide-processed waste is

stored] had collapsed, this could have been catastrophic." (Jim Lobe, 2002, Mining Watch)

Search articles by Jim Lobe and Mining Watch Canada for further information on Cameco's activities at the Kumtor Mine in Kyrgyzstan.

Alice Springs, Australia

Cameco announced its intentions to try to locate uranium mines near Alice Springs Australia in 2008. Relations between Cameco and the community have not gone well to date. Once again, the point of contention is Cameco's refusal to answer questions from the people who will be most affected by the mine. In the incident below, Cameco called the police on a group of mothers and pre-schoolers who went to their office to get questions answered. "We had a very eventful morning today at our regular Pram Jam. Pram Jam is a monthly family-friendly peaceful demonstration to voice our concerns about uranium exploration at Angela/ Pamela (Alice Springs, Australia). We are a group of usually 20 mums and dads and that many again of babies and young pre-school children. We visit local MP offices etc (and Cameco for the first time today) jamming the prams into the offices and asking questions."

"We visited the Cameco office today and met with intense resistance and rudeness from the PR people there, and they even called the cops on us! They wouldn't talk to us with children in our arms, demanded that we leave and belittled us. They have even put in a complaint to the police against our spokesperson for the action." (Families For A Nuclear Free Future, Australia, March 15, 2009)

I'm sure Cameco is feeling some frustration as more people become aware of their 'track record' of contamination. With global communication as it is today, little effort is required for communities in Canada to inform groups in Australia about Cameco's impact on the environment and people they come in contact with.

Depleted Uranium Munitions

Cameco manufactured many depleted uranium products in its metal fabricating building in Port Hope. The list of components included ballast for aircraft, armament for military vehicles and some components of the shells themselves. Cameco and the CNSC both refuse to reveal the full extent of Cameco's involvement with supplying depleted uranium components to the Americans.

In Closing

This is by no means a complete list of significant events for which Cameco is responsible. Individual communities have longer lists than I've included here. The large number of events reported in Port Hope is a result of a number of dedicated people continually exposing new abuses.

Community residents are the only defense we have against the greed of the corporation and the corruption within the Canadian Nuclear Safety Commission and Health Canada's Radiological division.

Cameco was one of the three majority owners of Bruce Power.

PART 8

Radioactive Waste

"In 1978, the Saskatchewan government's Cluff Lake Board of Inquiry concluded, in regard to reactor wastes: There seems to be general agreement that to store these wastes in such a manner that future generations would be required to exercise continued surveillance and maintenance of the storage facilities would be completely unacceptable. It thus becomes necessary to seek disposal techniques that will ensure that the wastes are safely isolated for several hundred thousand years. It then proceeded to approve a 'disposal' program, to contain wastes at the Cluff Lake Mine, for less than one hundred years!" (Dr. Jim Harding)

They know the waste is dangerous for hundreds of thousands of years yet they approved a 100-year disposal program. They just shifted the responsibility on to future generations. This practice is endemic throughout the nuclear industry in Canada and around the globe.

There is no prudent method yet developed to dispose of the ever-growing volume of radioactive waste. No country on Earth has been able to do it. Logic would suggest that if you can't get rid of the waste you're making, that you should quit making it. Unfortunately, logic is not a word normally applied to the nuclear regulators and the Canadian government. The radioactive waste piles continue to grow.

The public in Canada knew nothing about radioactive waste nor the dangers associated with it as late as 1975. It was never spoken of, nor was it ever brought up by the Canadian government until a school in Port Hope was found with elevated radon levels in late 1975. The miners at Elliot Lake started finding out the dangers about the same time.

Deline/Port Radium

The First Nations people of Deline were the first to realize something was wrong when they started dying of cancer in 1960. It was easy for the Canadian government to keep this problem quiet as Deline was a very isolated community. No one would hear of their problems for many years. The people of Deline were exposed to radiation when they carried ore, when they fished in water contaminated with radioactive tailings from the mine and when they were inside their own homes. Their homes were contaminated because they would use the discarded burlap sacks the uranium was carried in for clothing and household goods. Atomic Energy of Canada Limited (AECL) was still cleaning up waste in Deline in 2008, 46 years after the first complaints from that community.

Port Hope

Eldorado (Government of Canada) continued to give away radioactive waste material from uranium processing and used building products in Port Hope until 1966 to anyone who wanted it. Sadly, this 20-year period coincided with the post war building boom in Canada. The radioactive waste was placed under homes, businesses, schools, roads and public buildings in Port Hope and surrounding communities. The local school board was one of the main beneficiaries of this free building material. About a dozen schools were built and expanded in Port Hope, Cobourg and the surrounding towns during this period. Many of them are built on radioactive waste.

In 1966, the RCMP asked Dr. D.G. Andrews, Professor Emeritus, Nuclear Engineering, at the University of Toronto to "undertake investigative measurements in order to answer the question of potential illegal weapons production in Canada." After conducting his investigation of the waste sites in Port Hope, Dr. Andrews advised the Atomic Energy Control Board (AECB) that it should begin cleanup of the radioactive waste as soon as possible. His warnings were not heeded. In a subsequent paper on Port Hope in 1996, Dr. Andrews wrote: "The AECB and the town (Port Hope) had been interviewed in 1966-67 by myself as to the real radiation levels and their potentially damaging effects. However, urged on by potential developers and others, the town had gone ahead and permitted building right on top of the radioactivity. If the public caught on, then someone would have to pay." (Dr. Andrews, 1996)

The AECB and the Town of Port Hope officials hid the dangers of radioactive waste in the community for ten years before they informed the public. In addition to the warnings from Dr. Andrews in 1966, the Canadian Government had initiated its own testing the same year. In section 2.1 of his 1996 paper, Dr Andrews states: "Detailed data were also taken in the period 1966-76 by Dr. Geoffrey Knight of the Atomic Energy Control Board.

Unfortunately, his data (Dr. Knight's) was kept out of sight."

Thanks to Dr. Andrews, we know that the nuclear regulator (AECB), the Canadian Government, the Town of Port Hope and the RCMP knew in 1966 that the health of the residents of Port Hope was at risk because of the presence of so much radioactive waste. Yet not one of them did a thing about it for ten years.

Elliot Lake Miners

The general working conditions in the Elliot Lake mines were terrible. In addition, no miner was ever told of the dangers they faced from exposure to radiation. The miners finally took matters into their own hands in 1973. Elliot Lake miner Henry Groulx recounts: "I was in a union for a little while. Denison had the Mine Mills Union and then they switched over to the United Steel workers. The men changed the (working) conditions themselves, but the union took the credit. When they had the protest in 1973, it was a wildcat strike but you couldn't call it a wildcat strike because you could be charged. So we called it a protest for safety conditions. The protest was in 1973 when I was working underground. We were protesting ventilation, restroom conditions, working conditions, the right to refuse unsafe work like rock hanging over us and not waiting to work until after a blast. Nobody was really aware what uranium could really cause. We were protesting working conditions. The Ham Commission (mid-70s) was when we started to know about the diseases it causes and the radon gases. They knew but they weren't telling us." (pg. 84, *This Is My Homeland*, Lorraine Rekmans) In 1974 the Ontario Government appointed Dr. James Ham to study mine safety in Elliot Lake. Dr. Ham concluded that none of the miners were ever warned of the dangers they faced. Dr. Ham was also instrumental in reversing over 100 compensation claims with the Workers Compensation Board for radiation induced illness and death. This was the first time in the 42 years that uranium ore was mined in Canada that the workers were aware of the dangers.

Sulphuric Acid

The Canadian Government allowed a sulphuric acid plant to be built in the townsite of Serpent River First Nations. The sulphuric acid was used to leach the uranium out of the ore from 12 local mines. The plant ran from 1955 to 1962. Despite constant urgings from the community, the Canadian government waited 32 years to clean up the site.

There was never an attempt to quantify the impact the sulphuric acid plant had on Serpent River residents, despite being located in the middle of the community. Chief Earl Commanda stated: "The abandoned sulphuric acid plant left a bunch of concrete buildings and a whole bunch of pyrite piles and the remaining sulphuric acid piles. Our parents always knew when we were playing around those buildings because when we came home, the shoelaces on our running shoes would fall apart because of the acid and the pyrite. They would just literally rot off our running shoes." (*This Is My Homeland*, Lorraine Rekmans)

Serpent River resident Terence Jacobs continues: "If you went to work with something that wasn't 'acid clothes', they be like someone shot you with buckshot. If the wind would blow from the southwest and you had clothes on the line, they'd come out rusty, because the calcine would blow in your direction and everything would just get rusty. It burnt all the vegetation, maybe about a mile up that way and about a half a mile wide. They had to reforest that hill because the trees were all dead." (*This Is My Homeland*, Lorraine Rekmans)

The Public Finds Out

In 1975, St. Mary's Elementary School in Port Hope was found to have radon levels 21 times higher than the allowable levels in effect in Ontario at the time. Panic hit Port Hope. Hundreds of homes and public buildings were tested including all the schools. The students from St. Mary's were moved to other schools for two years while the radioactive waste was removed and the school decontaminated.

Unfortunately, we didn't find out until 2004 that several other schools in Port Hope and Cobourg were built on radioactive waste. The testing conducted at Dr. Powers Elementary School in 1978 in Port Hope by the Canadian Government showed radon concentrations under the kindergarten and gymnasium 125 times higher than the allowable level. The Canadian Government wanted to avoid further negative publicity and legal action so they gave Dr. Powers School a clean bill of health and never spoke of it again until we saw the original test report and file in 2004. They allowed our children to be educated in the school for 28 years, knowing it was built on radioactive waste.

In 1978, the federal government promised Port Hope they would initiate comprehensive health studies of the community and a cleanup of the waste. They cleaned some properties and then left town. The community is still waiting for the health studies and the complete cleanup 30 years later. The federal government refused to have anything more to do with Port Hope until 1990 when the municipality began a legal action against the federal government to clean up the town.

What is Radioactive Waste?

Radioactive waste is created at every stage of the nuclear fuel cycle. It usually falls into one of three categories; low-level, medium-level and high-level waste. These 'levels' do not refer to the toxicity of the wastes, but rather where the waste originated from. High-level waste is usually comprised of fission products and spent fuel assemblies from reactors. Medium-level waste is material from decommissioning, reprocessing or fuel fabrication. Low level waste embraces everything else. Low-level wastes can be as toxic as high-level waste.

One of the main problems with nuclear waste is that the composition of the waste is always changing because all the radioactive isotopes are constantly decaying. Each 'decay product' has its own level of radioactivity and penetrating qualities. If radium is taken into your body, it is considered a 'bone-seeker.' It will cause bone-related cancers as well as leukemia. When radium decays, it changes into radon gas. The radon gas mixes with the blood in the body. Radon gas has a half-life of 3.8 days and as such, starts to decay rapidly inside the body. The decay products of radon gas are radioactive bismuth, lead and polonium which are called the radon daughters or progeny. Radon and its daughters are the second leading cause of lung cancer. Though you started with only radium inside your body, the rapid decay of radioactive material has generated four more toxic substances, which in turn will decay themselves.

Exploration

Drilling test holes in the ground is the first step of the nuclear fuel cycle. Drilling near residential areas can impact the quality of people's drinking water in a couple of ways. If the drill holes aren't filled when they're completed, ground water and other contaminants can use the hole as a conduit to the water table affecting well water quality. Such was the case near Fredericton, New Brunswick in August 2008.

"Debbie Hudson has found herself hauling clothes to a laundromat and lugging bottled water back to her home several times a week. Hudson, who lives near the Gorge Road, says her well water is so filthy as a result of uranium drilling activity in the area that it can't be used for drinking or washing clothes. Since February my water had turned like a yellowish colour because it's dirt getting in there. It's surface water. Hudson, who says she tests her well each year, said the problems began in February, shortly after a uranium exploration company began drilling holes." (By Mary Moszynski, *Times & Transcript*, August 20th, 2008)

This problem could have occurred drilling for any type of mineral. It was solved by plugging the holes.

The other problem that can occur is when the drilling program intersects a zone of radioactive material as well as the ground water supply to homes. In

this case, the groundwater will become contaminated with radioactive material. This problem cannot be fixed.

Uranium Mines

The uranium mines have been responsible for massive damage to the environment and to the health of the miners who worked in them. Unfortunately, mines continue to cause damage long after they close. The tailings from the mines are left behind to spread radioactive, heavy metal and chemical contamination to the air, the water and the earth. There are almost 200 million tonnes of tailings at the Elliot Lake mines alone. Most of these tailings are covered with water held back by earth dams.

"The mining companies and regulatory agencies recognised that there were problems associated with the closure of large uranium mining/milling facilities because the waste management areas were not originally designed with currently acceptable standards in mind. Although these concerns have been addressed, the communities in the Serpent River Watershed are faced with the reality that 170 million tonnes of tailings from the uranium mines 'present a perpetual environmental hazard.' The management of the tailings will always be a challenge. The half-life of the radioactive hazards in those tailings is hundreds of thousands of years." (Mining Watch Canada)

Mine tailings are more dangerous than the ore they came out of. Tailings are ground up to a fine powder which allows all the radionuclides access to the environment. The tailings held in the ten dead lakes there constantly secrete their poisons into the groundwater. The Serpent River has become a river of poison from the dead lakes to Lake Huron.

Abandoned Mines

Many mining companies simply walked away from the mines they put into production. The cost of decommissioning these sites became the responsibility of Canadian taxpayers. The nuclear regulatory body, the CNSC, is to blame for much of this situation as they did not collect deposits from the mines before they allowed them to start producing. The development of these mines was encouraged by the Canadian governments of the day to supply uranium to the United States. Once the sites were mined out, the federal government bailed out leaving clean up costs to the provinces.

The Saskatchewan Institute of Public Policy took the federal government to task on the dangers from the mines and their economic responsibilities.

"While mining operations in northern Saskatchewan, that supplied the United States military with Uranium in the early days of the Cold War, ceased in the 1960s, people of this area continue to live to date with the environmental, human health and safety risks of the abandoned mines.

The Uranium industry of the Cold War era was not merely regulated, but was actively promoted by the Government of Canada to achieve its foreign and defense policy ends. The federal government's continued refusal to accept the financial responsibility for its forty-year old legacy of environmental, human health and safety risks is not only irresponsible but also out of step with Canada's international record on human and environmental health and safety issues. It is high time for the Government of Canada to take environmental risks in northern Saskatchewan as seriously as it does elsewhere in the world."

(Righting Past Wrongs: The Case for a Federal Role in Decommissioning and Reclaiming Abandoned Uranium Mines in Northern Saskatchewan)

In a 2000 survey of abandoned uranium mines, the nuclear regulator had to admit that most uranium mines with tailings were identified to have some form of stability and/or chemical problems.

Blind River

Ontario Ministry of the Environment test records show that the emissions from Cameco's Blind River facility have caused the uranium in soil levels to increase since the facility opened in 1983. I am not aware of the quantities of radioactive waste Cameco stores on site at Blind River.

Uranium Enrichment

"It is said that nuclear power is emission-free. The truth is very different. In the US, where much of the world's uranium is enriched, including Australia's, the enrichment facility at Paducah, Kentucky, requires the electrical output of two 1000-megawatt coal-fired plants, which emit large quantities of carbon dioxide, the gas responsible for 50 percent of global warming.

Also, this enrichment facility and another at Portsmouth, Ohio, release from leaky pipes 93% of the chlorofluorocarbon gas emitted yearly in the US. The production and release of CFC gas is now banned internationally by the Montreal Protocol because it is the main culprit responsible for stratospheric ozone depletion. But CFC is also a global warmer, 10,000 to 20,000 times more potent than carbon dioxide." (Helen Caldicott, The Australian, April 15, 2005)

The other negative aspect of the enrichment process is the massive volumes of 'depleted uranium' that is left over. The United States currently has about half a million tonnes of depleted uranium in storage. Depleted uranium is radioactive waste.

Spent Fuel Bundles

There are about 2 million spent fuel bundles in storage at the nuclear reactors in Canada. These spent bundles are so radioactive when they come out of a reactor that a person would die within a minute if he was within a metre of it. The spent bundles are placed in a giant swimming pool for eight to ten years to allow them to cool down and allow the radioactivity levels to be reduced. The spent bundles are then placed in concrete containers and placed on storage pads.

To make matters worse, a study released last week by the National Academy of Sciences shows that the cooling pools at nuclear reactors, which store 10 to 30 times more radioactive material than that contained in the reactor core, are subject to catastrophic attacks by terrorists, which could unleash an inferno and release massive quantities of deadly radiation – "significantly worse than the radiation released by Chernobyl, according to some scientists." (Helen Caldicott, The Australian, April 15, 2005)

Reprocessing Spent Reactor Fuel

The Canadian government, AECL and Cameco want to reprocess spent reactor fuel in Canada. This involves building a very expensive reprocessing facility that will have to be decommissioned as high-level waste at the end of its life.

The process involves chopping up the highly radioactive spent fuel bundles and dissolving them in boiling nitric acid. The process causes the release of radioactive gases and the contamination of the nitric acid which has to be dealt with as high-level radioactive waste. The plutonium and uranium are separated from hundreds of other radioactive products to be used to manufacture Mox (Mixed Oxide) Fuel for reactors.

Contrary to the industry's assertion, there is more waste at the end of reprocessing than what they started with. The separation of plutonium and uranium also cause security problems as this material can be used to manufacture nuclear weapons. Reprocessing spent reactor fuel into Mixed Oxide (MOX) fuel has been a failure in every country that has tried it.

England – It appears as if Britain is going to close the Sellafield Mox Plant after ten years of troubled operation. The Mox production plant cost almost a billion dollars to build when it opened in 1999 and has never worked properly. Further, it was hit by scandal concerning quality control and falsification of documents from the start. They were never able to regain business from the Japanese they lost as a result.

"It has suffered repeated breakdowns and, last spring, the then energy minister, Malcolm Wicks, admitted in response to a parliamentary question that

SMP had managed to reprocess only 2.6 tonnes of fuel per year between 2002 and 2007. Between 1998 and 2002, the plant produced annual figures respectively of 2.3 tonnes, 0.3 tonnes, 0 tonnes and 0 tonnes following a string of technical difficulties. Wicks said it was using 'largely unproven technology' and admitted that even when it operated at top capacity it could produce only 72 tonnes a year by 2001." (The Guardian, February 17, 2009, Terry Macallister)

This is a major blow to the British nuclear industry and the country as they have a 100-tonne stockpile of plutonium on hand. The Mox facility was to have manufactured this stockpile into reactor fuel. In addition to the cost of storage, the presence of this much weapons grade plutonium causes huge safety and security concerns.

"These discharges go into the sea, the surrounding countryside, the air and into us. Sellafield's waste discharges have made the Irish Sea the most radioactively contaminated sea in the world and its waste has been washed up on shores as far away as Greenland. Sellafield's pollution is found in the sea spray, soil, vegetation and bodies of animals and in people's homes. There are areas around Sellafield that are as radioactive as the land in the 'exclusion' zone around the stricken Chernobyl nuclear reactor." (Greenpeace, UK)

United States – Nuclear Fuel Services built and operated a reprocessing facility in West Valley, New York from 1966-1972. The facility processed 640 metric tonnes of spent reactor fuel while in operation and generated the following waste: "During the operation of the plant 660,000 US gallons (2,500 m³) of highly radioactive liquid waste were generated. The liquid waste was stored in an underground waste tank. Also stored on the site are 170 tons of used nuclear fuel assemblies, 140,000 cubic feet (4,000 m³) of solid waste, and 2.4 million cubic feet (68,000 m³) of buried low-level radioactively contaminated wastes. NFS also used a 15 acre (61,000 m²) area for the disposal of radioactive waste from commercial waste generators, and another seven acre (28,000 m²) landfill to dispose of radioactive waste generated from reprocessing." (Wikipedia)

The 640 tonnes of spent fuel processed is a small fraction of the total waste that was generated from reprocessing. Proponents of reprocessing claim that it reduces the stockpile of radioactive waste while in reality, it increases the total volume several times over.

"In 1976 NFS decided the costs and regulatory requirements of reprocessing (originally estimated to be \$15 million but later reported at a figure of \$600 million) made the venture impractical. The probability of a major earthquake in the area was also considered to pose too great of a risk to continue operations. The waste must be stored in an underground carbon-steel tank for around 200,000 years before it loses its radioactive potency, or recovered for its content of useful uranium, plutonium and fission products." (Wikipedia)

The State of New York commissioned a study on the West Valley site and found out it would cost between \$9-\$27 billion to clean it up.

Japan – In March 2009, Japan Nuclear Fuels Limited (JNFL) announced the 16th delay in completing its Rokkasho Reprocessing Plant which was originally scheduled to open in 1997. The \$20 billion price tag for the project is about three times what was estimated when the project started in 1993. Refer to an article by Eriko Arita (Nov. 27, 2008) titled: 'Rokkasho Plant too Dangerous, Costly' for more information on reprocessing and fast breeder reactors that burn MOX fuel.

France – "A July 2000 report commissioned by the French government concluded that reprocessing was uneconomical - costing about \$25 billion more than a 'once through' fuel cycle - and will do little to reduce the amount of long-lived radionuclides in the waste." (Public Citizen - Nuclear Waste Reprocessing)

Reprocessing spent reactor fuel is not economical and its effects are detrimental to people and the environment.

Nuclear Waste Management Organization (NWMO)

The NWMO is comprised of people from the nuclear industry and was formed to deal with high-level nuclear waste in Canada. They have decided on the deep disposal option with the ability to retrieve the radioactive material in the future. However, no high-level radioactive material will be placed in storage for at least 60 years.

This is not a method to deal with the mounting inventory of high-level waste; this is simply putting the problem and the costs on to future generations. The other reason they are avoiding burying the waste is that the Canadian government wants to reprocess the spent fuel bundles to recover plutonium.

Waste From Decommissioned Reactors

There are 27 reactors that have to be decommissioned at some point in the future which entails a huge volume of high-level radioactive waste. The work involved with decommissioning and the creation of a high-level waste storage facility will cost billions of dollars.

It is interesting to note that the authorities tell us that the reactors cannot be decommissioned until 50-100 years after they've been shut down to allow the reactor cores to cool down. Yet during the refurbishment of the reactors, workers have to work throughout these highly contaminated areas. The truth of the matter is that they are simply passing the costs and problems of decommissioning on to future generations.

Radioactive Waste Cleanup of Port Hope Port Hope Area Initiative (PHAI)

In 2000, the Canadian Government signed an agreement with the Town of Port Hope and Hope Township called the Port Hope Area Initiative (PHAI). The Canadian Government committed \$260,000,000 to clean up the estimated 1.5 million cubic metres of radioactive waste in Port Hope. This would be the size of 5 football fields 60 metres (195 feet) high.

No one believed they had allocated enough money to do the job as a similar size cleanup at Fernald in Ohio cost \$4.4 billion. The cleanup in Ohio involved one large site whereas the contamination in Port Hope is spread through 4000 residential, commercial and industrial properties.

In 2005, AECL officials informed the community at a public meeting that the updated volume of radioactive waste was 3.5 million cubic metres. This pile would cover 5 football fields to a height of 140 metres (460 feet). AECL admitted that their storage site could only handle 2 million cubic metres, yet they refused to say what would be done with the other 1.5 million cubic metres.

AECL solved the problem by changing the cleanup criteria for the waste they would exhume from the town. Instead of leaving the town in a 'pristine condition', AECL decided to leave 2 million cubic metres of contaminated material in place. This volume and level of radioactive toxicity will require the Canadian Nuclear Safety Commission to license the town as a nuclear waste site after the proposed cleanup is completed. This is not what the town was promised.

How Much Radioactive waste is There?

The reality is that they don't know how much radioactive waste there is. AECL has admitted they have not tested all the properties in Port Hope nor have they tested below the surface on most properties. They have never tested any of the 4000 properties for the full range of radioactive substances present in Port Hope.

AECL always claimed that only low-level waste was present in Port Hope. We found out this claim was not true in November 2007 when Port Hope residents tested positive for U236 inside their bodies. U236 comes from spent reactor fuel which is 'high-level' radioactive waste. AECL has publicly admitted they have not tested for U236. There must be a comprehensive survey completed of all 4000 properties in Port Hope, including sub-surface testing for the full range of radioactive substances. After 75 years, Port Hope deserves no less.

Dangers of Radioactive Waste Cleanup

Warnings have been sounded by independent experts that AECL's proposed method of cleaning up the radioactive waste in Port Hope may be VERY DANGEROUS to Port Hope and surrounding communities. Their main concern is the re-suspension of contaminants into the air we breathe. Many of these substances can travel hundreds of kilometers on the wind. The 4,000,000 people living in the Greater Toronto Area are well within the sphere of influence of these carcinogenic contaminants.

Dr. Chris Busby, PhD in chemistry from England has shown that the depleted uranium weapons deployed in the Gulf War caused a significant increase in Uranium in Air measurements in England. According to Dr. Busby: "The distance traveled from Baghdad to Reading (England) following the wind patterns implicit in the pressure systems at the time, is between 1700 and 2400 miles. Although this transport may be hard to believe at first, the regular desert sand events which occur in the UK should teach us that the planet is not such a large affair, and that with regard to certain long lived atmospheric pollutants, no man is an island."

As can be seen from the data in the 'indicator' health studies on Port Hope conducted by Health Canada in 1998 and 2000, the concerns of the experts are valid. The highest incidence levels of cancers and other diseases occurred between 1986 and 1996 or 10 to 20 years after the first radioactive waste cleanup of Port Hope started in 1976. This is not a coincidence. The 10 to 20 year delay represents the latency period of cancers and other diseases after exposure to their environmental causes.

During the 1970's radioactive waste cleanup of Port Hope, radioactive, chemical and heavy metal contaminants were disturbed from the ground they were contained in and re-suspended in the air we breathe. The same situation will occur during the current cleanup but there will be 40-50 times more material disturbed than there was during the first cleanup. How many deaths and illnesses will the re-suspension of this volume of carcinogenic contaminants cause?

Port Granby Radioactive Waste Cleanup

The Port Granby Radioactive Waste Storage facility sits directly on the shore of Lake Ontario just east of Port Hope. Port Granby was used to store a lot of the most radioactive and toxic waste from Cameco's facility. Spent reactor waste, depleted uranium and a full range of radioactive isotopes used in Port Hope are located there. The Canadian Government has decided that all the waste will be left where it is.

This scenario is not prudent because of its proximity to Lake Ontario. There is the potential for massive contamination of Lake Ontario as a result of short and long-term erosion on the site. This was the main concern of a similar topographical site in the United States called West Valley in New York. The state-funded study stated that the cost of excavating the waste and moving it to another location would be about \$9 billion. If the material was left in place, the subsequent costs of contamination and its cleanup could be as high as \$27 billion dollars. The Port Granby site is located on the bluffs; a part of Lake Ontario subject to rapid erosion. This is an issue for the cleanup of Port Hope as the town is built on a series of ravines. This material should not be left where it is. The contamination will continue to migrate.

Surrounding Communities

There have been no discussions concerning the fate of radioactive waste placed in surrounding communities. The radioactive waste from Eldorado is not confined to the political boundaries of Port Hope. It was hauled to Hamilton Township, Cobourg and throughout Hope Township.

The contaminated material under Burnham School in Cobourg is but one example. The Town of Cobourg doesn't want to speak out for fear of being stuck with the same nuclear stigma as Port Hope. But Cobourg should be careful because the contaminants do migrate. Radioactive contaminants from Burnham School could have reached Factory Creek in the 50 years since the school was built on radioactive waste.

Loss of Property Value

One of AECL's consultants told a public meeting attended by 70-80 people in 2005 that property values in Port Hope are about 12% lower than they should be due to the presence of radioactive waste and the nuclear industry. This 12% loss of property value equates to about \$120 million or \$30,000 per house based on 4000 properties in Port Hope. This applies to every property.

There is a large group of people who bought properties with a clean bill of health only to find out during later testing that the property and the house are contaminated with radioactive waste. If these people decided to resell their property, they would have to disclose the property is contaminated which would significantly reduce its value, if they could sell at all. There is no protection in place for them.

Summary on Port Hope

This is by far the largest cleanup of radioactive waste in Canadian history. The project is massive, very complicated and if not done correctly, very dangerous. It is outrageous that AECL is in charge of the project as they were the organization responsible for causing the problem for the past 50+ years.

There is no funding in place to allow independent experts to research and present on behalf of concerned citizens in the community. A short Internet search of the methodology used in the United States for radioactive waste cleanups and their cost will expose the cleanup of Port Hope for the imprudent and incomplete farce that it is.

Two Sets of Rules

Why do individuals and small businesses have to clean up their waste while large corporations can create as much waste as they want and simply stockpile it for future generations to deal with? Why are there two sets of rules?

As individuals, our conduct is governed by laws put in place by municipal, provincial and federal governments. If we do not obey the laws, there are repercussions. If you don't clean up after your dog, you get fined. If you have too many junk cars on your property, the city has laws to force you to haul them away. If you keep piling garbage up behind your restaurant, the Health Department will fine you and possibly shut you down. If you own a pig barn, the province will not let you dig endless holes in the ground to store the waste. You have to find a way to get rid of it or they will shut you down. These laws are in place to protect us and our environment. Most of us agree with them.

There are no such laws in place for many large industries that create massive volumes of toxic waste. They are allowed to continue generating waste without having any type of plan or solution in place for cleaning them up. Nuclear reactors continue to generate high-level radioactive waste and currently store two million spent fuel rods near the reactors. Uranium mines have hundred of millions of tonnes of radioactive mine tailings stored on land and in water. The contaminated water from oilsands extraction is stored in toxic waste ponds covering 50 square kilometres. The Swan Hills incinerator contaminated a 30 km. radius with PCBs and other toxins that can't be cleaned up.

The Canadian Government is directly responsible for many of these abuses. For instance, there are bans on gas engines on some pristine lakes in Canada. Yet the Canadian Government can change the designation on these pristine lakes to a toxic waste dump to allow mining companies to dump untreated mine tailings into them. This has been going on since at least the 1950s when the Canadian Government allowed the uranium mines at Elliot Lake to dump mine tailings into ten lakes. All ten lakes are DEAD and the radioactive toxins continue to contaminate the downstream watershed all the way to Lake Huron. It has become a river of poison.

The corporations are making huge sums of money off our resources, yet it is the taxpayer who has to pay the bills to clean up the mess they leave

behind. I don't begrudge industry their profit but I am fed up that they are not held to the same standards as we are. There should be only one set of rules.

As our parents told us; if you make a mess, you clean it up.

PART 9

Canadian Nuclear Safety Commission (CNSC)

"The (Cameco, Port Hope) site includes approximately 44 structures or activity areas. The structures which have been constructed since the 1960's should have been designed and constructed in compliance with one of the editions of the National Building Code. None of the structures were constructed in compliance with the edition of the National Building Code that was in effect at the time of the design and construction of the buildings." (Cyril Hare Report, Dec. 20, 2005, pg. 2)

The Union of Industry and Regulator

The CNSC (and formerly Atomic Energy Control Board AECB) has allowed Cameco (and formerly Eldorado) to operate in non-compliance of the National Fire and Building Codes since the codes were instituted in the 1960's. This 'symbiotic relationship' between regulator and industry has existed since the AECB was created in 1946 and it is still flourishing today.

This relationship was pointed out in 1980 during British Columbia's commission on uranium mining. In the report, the British Columbia Medical Association (BCMA) stated: "Such a policy statement (from AECB), based on antiquated data and inadequate literature review, would be irresponsible coming from the nuclear industry, let alone the regulatory agency of that industry. However, as will become clear, it is difficult to ascertain where one ends and the other begins."

The BCMA went on to show that the regulators' advisory committee on radiation levels was comprised almost entirely of former AECL employees. The only medical doctor on the committee had worked his whole life at AECL. The BCMA report continues: "Dr. Butler (AECB) agreed that his Committee had not asked any independent bodies, such as the Canadian Medical Association, the Royal College of Physicians and Surgeons, or the Royal Society, to place a member of its own choice on the Committee. The 'independence' of this Committee must be seriously questioned. This lack of 'independence' is characteristic of the Atomic Energy Control Board." (Health Dangers of Uranium Mining and Jurisdictional Questions, 1980)

In its final report, the BCMA concluded: "The AECB is not fit to regulate."

Non Governmental Organizations (NGO), grass-roots groups and individuals have always complained of the bond between industry and regulator.

W.R. Adamson filed a petition with the Auditor General regarding Cluff Lake on June 25, 2004. The following is taken from his petition.

"It has been known for some time by citizens and various citizen groups that CNSC is more interested in facilitating and protecting the uranium industry than guarding the environment and health of the workers and public interest. The size of the investment and supposed economic returns provide undue political pressure to override the inconvenience of delays by sound environmental assessments, and the difficulties of long-term problems such as the immense wastes along the shores of Lake Athabasca, which have not been cleaned up in 50 years, and which will require billions of dollars to do so." (W.R. Adamson, 2004, Petition to Auditor General)

In his closing comments in a letter to the CNSC, Dr. Edwards stated: "CNSC staff seems to be acting almost as an apologist for the proponent (Bruce Power), running interference for them by blocking efforts to ensure a more thorough level of public accountability on environmental matters. CCNR wonders what real value there is in even having a regulatory agency if that is as far as it is willing to go in terms of transparency, accountability, and vigilance." (Dr. Gordon Edwards, April 25, 2005)

"That said, there's legitimate concern over the extent to which Keen and senior staff are privately meeting with nuclear interests. This is all happening as the industry holds a 'full court press' to expand operations – while pushing for more lenient environmental assessments – in several provinces. When you understand that they're conducting these meetings effectively in secret, and you combine that with the increasing regulatory leniency that the (commission) is showing to the nuclear industry, I think two and two make four. This is an agency that has been seriously co-opted, and is in serious need of reform." (David Martin, Grenpeace)

Report Criticizes CNSC

To counter these accusations, the CNSC commissioned a report into the matter by the Institute on Governance. The report confirmed our concerns and was critical of the CNSC. The CNSC subsequently tried to dismiss the conclusions of the report they had ordered. The following excerpt from an article in the Globe and Mail sheds more light on the relationship between the nuclear industry and the CNSC:

"Canada's nuclear-safety watchdog appears to be too cozy with the industry it's supposed to monitor, suggests an independent report. The study ordered by the Canadian Nuclear Safety Commission (CNSC), an independent federal government agency that regulates the use of nuclear energy and material, cites long-standing complaints that the regulator focuses far more on the companies it licenses than on concerned lobby groups or citizens."

The commission "has in the past put more focus on communicating with licensees than with non-government organizations and the broader public," says the report by the Institute on Governance, a non-profit organization aimed at promoting effective governance. "And this may have contributed to the perception among NGOs that the (commission) has too close a relationship with industry. Recent efforts to more effectively engage NGOs are aimed at addressing this issue. Critics have gone further, saying the commission's closed-door sessions with nuclear interests should raise alarms that the regulator is being co-opted." (Globe and Mail, Oct. 9, 2007)

Inability to Fight Radiological Fires

Port Hope residents came 'face-to-face' with the industry/regulator union at the 2005 Mid-Term License Review Hearings. It was assumed that the Hearings would give Port Hope residents an opportunity to voice their concerns and have some of their questions answered concerning the two nuclear fuel cycle facilities located in the middle of town. Nothing could be farther from the truth. We were not allowed to ask questions, though the Commissioners could ask individuals questions on their presentation.

In his presentation, Port Hope Councillor John Morand told the CNSC Commissioners that the Port Hope Fire Department could not fight radiological fires at Cameco and Zircatec. When Mr. Morand finished, a Commissioner asked Zircatec President Lloyd Jones if he knew about fire fighting limitations. Mr. Jones said he didn't know about it.

Mr. Morand immediately produced a letter from Port Hope Fire Chief Frank Haylow which stated: "Based on the significant risk this licensed industry poses if a fire or other emergency were to occur, it is my professional opinion that our current volunteer staffing model would not be sufficient to deal with a large fire or hazardous materials emergency at this location."

The letter had been sent to Zircatec, Cameco and the CNSC 3 months before the Hearings. Mr. Morand produced another letter from the CNSC to Zircatec and Cameco informing them of the fire fighting limitations.

This exchange over the lack of fire protection was disturbing on many levels and it illustrates the inappropriate protection the CNSC is providing to Cameco, Zircatec and its staff at the expense of Port Hope residents. Consider the following:

- A private citizen had to inform the CNSC Commissioners that there was no capability in Port Hope to fight radiological fires.
- The CNSC Staff reports on Cameco and Zircatec made no mention of the fire fighting limitations.
- The CNSC has known of the inability to fight radiological fires for 24 years but has done nothing to rectify the situation to protect Port Hope.
- The Commissioners did not reprimand or admonish CNSC Staff for excluding the fire fighting limitations from their report or for failure to ensure the provision of adequate emergency services.
- The President of a nuclear fuel cycle facility lied to the Commissioners about his knowledge of the limitations of the Port Hope Fire Department. The Commissioners did not reprimand Mr. Jones for lying to them.

The CNSC hired Consultant Cyril Hare to determine the adequacy of fire protection at Cameco and Zircatec. The report stated: "At the present time, Zircatec must rely on the Port Hope Fire Department to control and extinguish fires in its property. The Port Hope Fire Department is not equipped, trained or staffed to deal with the worst case emergency that could occur at Zircatec Precision Industries. (Cyril Hare Report, 2005)

The identical statement was written about Cameco.

The CNSC failed to ensure that Port Hope residents were protected from accidents and fires at Cameco and Zircatec. The CNSC has always been aware of the problem but did nothing about it. It was community groups, not the nuclear regulator who exposed the shortcomings and forced the required changes.

Incestuous Relationship

The only thing we got from our participation in the 2005 Hearings was an understanding of the incestuous relationship between the CNSC, the nuclear industry and the CNSC Commissioners.

The president of the CNSC is also the chair of the Commissioners. How can you have an independent oversight body when the same person is the head of both organizations? To my knowledge, there is no other regulator that operates in this manner. As one observer said: "They have the same fox leading the foxes as they have in charge of the henhouse."

It was evident at the Hearings that CNSC president Linda Keene was using her commanding positions as head of the CNSC Staff and the Commissioners to protect the staff from being held accountable for their incompetence and corruption. This is a blatant conflict of interest. The Commissioners are supposed to be at arm's length from the CNSC yet Linda Keene controlled both organizations.

The CNSC Commissioners are a civilian oversight body on the CNSC. Their function is similar to that of the Senate in Ottawa. I have no doubt that the Commissioners are competent and well respected in their fields, but their knowledge of the nuclear-related situations in a specific community pales in comparison with that of the people in the community who have spent years researching the conditions they live in.

Community members are virtually excluded from most regulatory processes. We are allowed to make a ten minute intervention at some hearings, though we cannot ask questions and expect a response. Most of the time, we are restricted to submitting written comments.

Does Uranium Burn or Explode?

A public debate raged in Port Hope after the Hearings on the physical properties of uranium. Cameco and Zircatec were adamant that uranium would not burn or explode. Community groups produced information including a copy of Cameco's own MSDS (Material Safety Data Sheet) specifications, that stated that uranium did burn. We wrote the CNSC and asked them to settle the debate. They never responded to our requests.

During a February 2006 Port Hope Council meeting, Port Hope Fire Chief Frank Haylow gave council an update on Cameco's efforts towards improving fire protection. After his presentation, the first question directed at him from the audience was whether the CNSC had informed him if uranium could explode. Mr. Haylow responded: "The CNSC couldn't tell me if uranium could explode or not." (Fire Chief Haylow to Port Hope Council, February 2006)

We were stunned. The CNSC is the nuclear regulatory body of the country that supplies the most uranium in the world and it couldn't tell our Fire Chief whether uranium could burn or not. How can we protect our communities from fires and accidents if the CNSC cannot tell us the dangers we face from the materials they are supposed to be regulating? We realized that we were on our own.

Community Groups Fight Back

In 2004, Cameco applied to the CNSC to possess and process enriched uranium in Port Hope. The CNSC allowed Cameco to analyze the project with a Screening Level Environmental Assessment; the lowest level of assessment possible. As such, there were no funds available to have independent experts analyze the proposal on behalf of the community. The task was left to community groups.

As we went through the 900 page Environmental Assessment (EA), it was very obvious that a great deal of information was missing and several studies that were referenced, simply did not exist. We compiled a list of 623 questions and submitted them to Cameco and the CNSC. Heather Jarrett from the CNSC was blunt in her response: "The CNSC is not mandated to answer your questions." And they never did answer any of more than a hundred questions directed at them.

Cameco answered about half the questions and expanded the EA to 1350 pages. We submitted a further 200 questions and requested more information.

Cameco responded with a 2200 page version of the EA. By this time, Port Hope Council began to take our concerns seriously and hired consultants Jacques Whitford to Peer Review the EA. Jacques Whitford raised the same concerns we did and submitted 200 questions to Cameco.

Cameco refused to answer the 65 most important questions which triggered a scathing report by Jacques Whitford on Cameco's EA. The report criticized the actions and inactions of the CNSC as much as those of Cameco. The following are some of their findings:

"CNSC staff has not followed the directives of the CNSC Commission with regard to health issues, has not followed the CNSC's Guidelines or the requirements of the Canadian Environmental Assessment Act."

"Cameco states, and the CNSC appears to accept, that it was not necessary to determine the significance of environmental effects, when clearly the Act requires a determination of significance for all adverse environmental effects of the project."

"Cameco and the CNSC are not preparing or providing information that the (CNSC) Guidelines require. The Municipality of Port Hope needs more information with respect to potential threats, response capabilities and security requirements."

"The Environmental Assessment does not contain required information with respect to the potential health effects or cumulative health effects of uranium as a chemically toxic substance."

The Jacques Whitford Report was released to the public on the morning of September 22, 2005, the deadline for submissions. Cameco withdrew their application that afternoon. By that time, the CNSC was under attack as much as Cameco. It was better for Cameco and the CNSC to terminate all discussions than it was to have their conduct scrutinized any further during the scheduled hearings.

This application would have proceeded with a 'rubber stamp' from the CNSC if it weren't for the effort and dedication of community groups who exposed the false and missing information. There was never an instance during this process where the CNSC acted in the best interests of Port Hope residents. Their only concern was to protect Cameco and its application from thorough scrutiny.

Two months after withdrawing their application to process enriched uranium, Cameco purchased Zircatec (builds fuel rods) in Port Hope. In 2006, Zircatec (Cameco owned) applied to the Canadian Nuclear Safety Commission (CNSC) to possess and process enriched uranium in Port Hope in their facility within 50 feet of a group home. Zircatec's application was also assessed through a screening level EA. However, to avoid the scrutiny the first application was subjected to by community groups, the CNSC changed the rules concerning community participation in the process.

According to Families Against Radiation Exposure (FARE):

"Public opposition at the environmental assessment stage forced Cameco to cancel plans for SEU production at its Port Hope conversion facility last year. Since then, however, the rules have changed. The CNSC recently revised its rules for public participation at environmental assessment hearings before the Commission. From now on, "decisions on environmental assessment guidelines are now made by the Commission via an abridged process in closed sessions." Participation will be limited to licensees and CNSC staff. According to the CNSC website, "public involvement in a screening is at the discretion of the responsible authority and depends on factors such as the nature of the project, its environmental setting and public concerns.

FARE regards this latest move to be a cynical 'back door' attempt to introduce large-scale production of SEU into our community, without any meaningful input by the people who live here. Although CNSC president Linda Keen said there still will be public participation, the new rules appear to limit it to "consultations led by CNSC staff or the proponent."

"The CNSC has shown once again that it's priority is to serve the interests of the nuclear industry at the expense of the people who must live with the consequences. The CNSC process makes a mockery of environmental laws that were intended to give people real influence in decisions affecting their lives. The CNSC turns this on its head by preventing informed, effective public participation. It is time for the federal government to protect us by abolishing this Commission and creating an alternative for Canada that truly works in the public interest." (Families Against Radiation Exposure, 2006) How can the community feel any confidence in the safety of these projects when there is no transparency, no due process and no opportunity for the public and experts to be involved? The CNSC is preventing all meaningful community participation in the process. The more the community educates itself about what is going on, the more the CNSC removes us from involvement in the assessments.

Health Studies

The CNSC's predecessor, the Atomic Energy Control Board (AECB), promised they would conduct comprehensive health studies in Port Hope starting in 1978. We are still waiting.

In October 2004, the CNSC's Barclay Howden told Port Hope Council that the CNSC would no longer order health studies. It was now Health Canada's responsibility to do so. We met with Federal Health Minister Carolyn Bennett the following month in Ottawa. She listened attentively and agreed there appeared to be problems in Port Hope. But as with all her predecessors since 1978, she did not order health studies.

In the summer of 2006 at a Health Forum in Port Hope, Health Canada announced that they were no longer responsible for ordering health studies in Port Hope. It fell under the jurisdiction of the CNSC once again. When contacted, the CNSC responded that they would order no further health study as health studies were the responsibility of the province and they would respect the province's jurisdiction.

The CNSC is using the same tactic in Port Hope as the Canadian Government used with the people of Deline and the Veterans who were exposed to atomic bomb tests. They delay the testing as long as they can so that the people who were affected can die off before the illnesses and deaths are counted.

Linda Keen Firing

It was revealed during the November 2007 maintenance shutdown of the NRU reactor that generates the medical isotopes that AECL had not installed safety equipment on the reactor as mandated by their 2005 license renewal. The Canadian Nuclear Safety Commission (CNSC) ordered the reactor shut down until the safety equipment was installed. The Federal Government subsequently set a dangerous precedent by overruling the CNSC and ordered the reactor restarted without the safety equipment in place. The Canadian Government fired the head of the Canadian Nuclear Safety Commission because she would not compromise safety for profit in this instance. This is a dangerous precedent.

Recent Leaks at NRU Reactor

The CNSC and AECL have come under fire recently for not publicly announcing the three most recent leaks at Chalk River's NRU reactor; Dec. 5 and 9, 2008, and February 22, 2008. John Bennett, the communications director for the Green Party, said the CNSC should have ordered the reactor shut down as soon as problems (leaks) were discovered. "Of course, is the nuclear safety commission going to shut down that reactor for safety after what happened a year ago?" asked Mr. Bennett. "The people responsible for safety are afraid to shut it down because the last time they held up production, their president got fired." (Gloria Galloway, Globe and Mail, January 29, 2009)

"The NRU (built in 1957) is old and prone to operational problems. It is noteworthy, that the cause of the December 5th leak has never been determined and staff have acknowledged that it is likely to happen again. As recently as February 23, 2009, the AECL reported yet another potential leak. This does not inspire confidence. We need more information and we need independent, peer-reviewed research that helps answer some of the questions posed. If AECL stands behind their statements about "no risks to human health or the health of the Ottawa River, then why not make all information available to the public, to allow for appropriate consultation and science-based decision making?" (Meredith Brown, Riverkeeper and Executive Director)

Environmental Assessments (EA)

Canada's Auditor General

According to the Auditor General's 1998 Report of the Commissioner of the Environment:

"6.7 - Environmental assessment is the examination of planned projects, programs, policies or activities to ensure that potential impacts on the environment receive careful consideration before decisions are taken in connection with them. It is a critically important planning tool, given the potential for serious and irreversible damage to the environment that can result from human activity. Failure to consider adverse environmental impacts before carrying out an undertaking can lead to significant environmental degradation, damage to human health, and increased economic costs. The high clean-up costs and environmental damage at the Sydney Tar Ponds in Cape Breton illustrate some of the consequences of lack of environmental foresight."

"6.67 - A majority of the 187 files we examined had screening reports that did not meet the minimum criteria set out in the Canadian Environmental Assessment Agency's (CEAA) guide. In particular, the description of the project or of the environment was often incomplete. This would make it very difficult for a member of the public to determine whether the environmental assessment had in fact considered all of the potentially significant environmental effects of the project."

Pickering and the Federal EA Process

The following is from the Standing Senate Committee on Energy, the Environment and Natural resources investigating the environmental assessment for the restart of the Pickering reactors.

"The Committee heard strong, often conflicting opinions about the adequacy of the recently completed federal environmental assessment of the restart

of Pickering A. While OPG officials held that the review exceeded the legal requirements for a review of a restart, citizens groups, municipal councils and others held that it was seriously deficient. Chief among the criticisms were that:

- The assessment excluded any consideration of a severe accident at Pickering A or the consequences of such an accident beyond the plant site,
- That alternative ways to meet electricity demands were not considered
- An independent, full-panel review was not ordered and
- The CNSC poorly met its obligations under the Canadian Environmental Assessment Act.

"Until recently, no nuclear power generating station has been the subject of a federal environmental assessment. Some aspects of the industry have been assessed and projects at stations have been reviewed. However, no station as a whole has been subjected to the review process. All currently held licences were initially granted prior to 1995, the year that CEAA came into force. Although the federal Cabinet had established the Environmental Assessment and Review Process (EARP) Guidelines in 1984, before many of Canada's nuclear power reactors first operated, the Cabinet order was not applied to them. It was not considered mandatory until it was later challenged in court. Review panels under the EARP Guidelines were completed on the concept of deep geological disposal of nuclear waste, on uranium mining developments in Northern Saskatchewan and on the uranium mine tailings areas of Elliot Lake." (Canada's Nuclear Reactors: How much Safety is Enough?, June 2001)

Bruce Power Refurbishment

Many people complain about the lack of opportunities for the public to comment during the regulatory process involving these projects. The CNSC has continued to curtail these opportunities for Canadians. Dr. Edwards speaks to this in his submission to the CNSC: "Many of the comments related to the meager opportunities for citizens and non-governmental organizations to undertake a meaningful review of this gargantuan project, due to the CNSC Staff's intention to deny any opportunity for an independent panel hearing, consequently the absence of intervenor funding, combined with the CNSC Staff's determination to roll several large projects (the refurbishment of units 1 and 2, the eventual retubing of units 3 and 4, and the switch from natural uranium fuel to slightly enriched fuel) into one low-level environmental screening review." (Dr. Gordon Edwards, April 25, 2005)

Cluff Lake Mine EA

W.R. Adamson filed a petition with the Auditor General on June 25, 2004 on the Cluff Lake EA which stated: "Moreover, the mining industry has brought undue pressure on the CEAA to speed up environmental assessments, or to by-pass them, by using the principle that 'what seems to be a similar situation does not need a separate assessment.'" This is a dangerous principle for uranium mining where each mine is unique in situation, geology, environmental and geographic characteristics. If the current Cogema proposal serves as a prototype for future decommissioning, then we can expect serious problems for Canada, and particularly Saskatchewan, in future times.

"The Comprehensive Study Report claimed that Cogema had done extensive public consultation. Yet, the public could not have given a 'considered response' because even when CNSC issued its Report it did not include the primary data and test results for making future projections. Later the CNSC staff stated that anyone could have accessed the volumes of data, such as 2000A, 2000B, 2000C, 2000D - but they did not tell the public they were available until the formal document came out. After that there were only a limited number of days in which citizens could make interventions. The public consultation was a farce!" (W.R. Adamson, Petition to the Auditor General regarding Cluff Lake on June 25, 2004)

Radioactive Waste

The largest radioactive waste cleanup in Canadian history is currently in the planning stages in Port Hope Ontario. The project is being managed by Atomic Energy of Canada Limited (AECL), the Federal organization that caused the radioactive waste problem in the first place. The project is being assessed through a Screening Level environmental assessment. This is the lowest level environmental assessment possible. In essence, the proponent (AECL) is assessing itself.

Consultation Periods Too Short

Grass roots community groups and interested individuals have complained they are not being given enough time to assess complex nuclear projects. The inadequacies of the length of consultation periods were brought to the attention of the CNSC at their September 13, 2007 Public Meeting by both AECL and Greenpeace. The subject under consideration was the siting for new nuclear reactors.

Dave Torgerson from AECL: "We have a little bit of concern with the proposed 60 day consultation period since it is not clear to us that that would provide sufficient time for us to comment more fulsomely on this." (pg. 154, CNSC Transcript)

Shawn Patrick Stensil from Greenpeace stated: "We agree with the AECL in terms of problems of having a 60-day consultation period. Other members of the NGO community have long felt that." (pg. 156, CNSC Transcript)

These gentlemen were saying 60 days was not enough time for their large well-funded organizations to comment on the creation of a regulatory document. Yet the CNSC expects unfunded community groups to comment on something as complex as the installation of an enriched uranium process in 30 days without allowing us to see the documents their decision is based on. Where is prudence and fairness in this situation?

Summary

The CNSC is trying to legislate community involvement right out of the regulatory process for nuclear projects. Citizens have become too well-informed for the comfort of the regulators and the industry. The CNSC has maintained its stance the past few years of reviewing projects with the lowest level of assessment possible.

The CNSC's incestuous relationship with the nuclear industry has caused needless harm to people's health and our environment. They have consistently ruled in favour of the nuclear industry to the detriment of Canadians. The massive contamination of Deline, Port Hope, Serpent River, Pinawa, Chalk River and other sites bears witness to the CNSC's incompetence and corruption with respect to protecting Canadians.

Canadians must have a forum to voice their concerns regarding the nuclear industry. The nuclear regulators have abandoned their mandated responsibilities in favour of climbing into bed with the nuclear industry. The incestuous relationship between the industry and the regulator is now complete.

There is no ethical voice working on our behalf.

PART 10

Nuclear Follies - Round 2

In early 2008, the Ontario Government announced that it was accepting bids from companies to build two nuclear reactors in the province. The original deadline for submissions of October 1, 2008 was extended to December 31 at the request of the reactor companies because they were unable to get their bids in on time. When December rolled around, the companies asked for and received another extension to March 2009. It does not bode well for the future when these companies can't even get a paper submission in on time let alone build the reactors on schedule.

Has Anything Changed?

Alberta, Saskatchewan, Manitoba, Ontario and New Brunswick are all considering the possibility of building new nuclear reactors in the coming years. It appears they have all forgotten the massive debts caused by the first round of reactor construction in Canada in the 1970s and 1980s. The last reactors built in Canada were at Darlington. The four reactors were supposed to cost \$4 billion but the final price tag was over \$14 billion or three-and-a-half times as much. There has never been a nuclear reactor built in North America on time and within budget.

The only province that is actually short of electricity is Ontario. They need the power because the reactors they have are already broke down. If all the reactors were operating as AECL claimed they would, Ontario would not be short of electricity.

Areva (France's reactors) started building their new model of reactor in Finland in 2005. It was to be completed in 2009 at a cost of \$6 billion. At the start of 2009, it was three years behind schedule and more than 50% over budget. The project has received over 2000 citations from the Finnish nuclear regulators for construction and supervisory deficiencies. Siemens, the massive engineering company, is threatening to pull out of the project and Finland has started legal proceedings against Areva for almost \$4 billion for cost overruns and replacement power.

Canada has accumulated hundreds of millions of tonnes of radioactive waste since the reactors were first built. None of this toxic material has been disposed of yet. Scientists have never come up with solutions for dealing with radioactive waste. It is continually piling up in our lakes, on land, in our towns, our research facilities, at the reactors and inside the bodies of Canadians.

Though no figures are available in Canada, the United Kingdom estimates it will cost \$145 billion to clean up the radioactive waste they have at home. Granted, they have some extra costs because of the contamination caused by their reprocessing facility. On the other hand, Canada has about 400 million tonnes of radioactive tailings at uranium mines while the United Kingdom has none.

The massive costs for radioactive waste disposal, decommissioning facilities, failed reactor designs, legal actions and increased health care have saddled our children and grandchildren with a massive debt from Round One of reactor construction in Canada. Why are we considering building more reactors when we haven't paid the bills and cleaned up the mess from the first ones?

Who Wants Reactors Built?

Different organizations have different reasons for wanting to build nuclear reactors in Canada. The Canadian government spent billions of dollars trying to become a global nuclear power since the second World War. Canada's main claim to nuclear fame was to supply the uranium and plutonium to the United States for their nuclear weapons program until the 1970s.

Canada had some initial success with CANDU reactors in the 1970's but problems quickly developed. Reactors that were supposed to operate for 40 years were forced to shut down after little more than a decade of operation for re-tubing. A few years after being re-started, Ontario Hydro had to shut down eight of their twenty reactors because of poor performance and safety concerns. Some of the reactors were refurbished starting in 2003 for about the same amount they cost to build in the first place. Some were too damaged to fix and are permanently shut down.

Canada has plans to significantly expand the nuclear industry. They want to build more reactors, build a uranium enrichment facility, reprocess spent reactor fuel and become a repository for high-level nuclear waste from other countries. To accomplish these objectives, Canada joined the George Bush-inspired Global Nuclear Energy Partnership (GNEP).

Atomic Energy of Canada Limited (AECL) desperately has to sell a reactor in Canada before anyone in the rest of the world will buy one. AECL has only sold one of its reactors in the last twelve years. The world avoided CANDU reactors after eight of them were shut down by 1997. AECL gave itself another 'black eye' in 2005 when they cancelled work on the ACR-700 reactor because it did not function in the manner they intended with their design. This was to be AECL's 'next generation reactor.'

The worst blow to AECL's reputation came with the cancellation of the Maple reactors in 2008 which were supposed to cost \$140 million. They admitted defeat after spending \$600 million and 19 years trying to build a replacement for the 52 year-old NRU reactor which currently produces half the world's medical isotopes. Ironically, South Korea's Hanaro Reactor is based on AECL's Maple reactor and it is working very well. Perhaps AECL should import some expertise from South Korea.

Bruce Power wants to build reactors in all the provinces to sell electricity to the United States. Many states south of the border have put moratoriums in place on reactor construction until waste issues are resolved. The United States would get the electricity while Canadians pay cost overruns, deal with all the wastes and assume all the risks in the event of a major accident. The only winner in this deal is Bruce Power's bank account.

Cameco is the world's largest supplier of uranium and uranium processing. Obviously, Cameco wants more reactors built to consume their product.

Trans Canada Corporation (one of three majority Bruce Power owners) wants to build and operate the electricity transmission lines to the United States electricity grid.

The Canadian government needs a nuclear province in the west to fulfill its obligations to the Global Nuclear Energy Partnership (GNEP).

Cost To Build Reactors

According to their 2008 Economic Impact Report, Bruce Power estimates the project to build four reactors in Alberta will cost \$12 billion or \$3000 per kilowatt. (A 1000 megawatt reactor is equal to one million kilowatts) This figure has no basis in fact as most current estimates are two to three times this amount.

Bruce Power is following the same tactics used across North America 30 years ago where the cost of building reactors was purposefully underestimated to make the project seem cost-effective. Once construction was underway, the true costs would be revealed. By this time, the utilities building the reactors had too much invested to back out.

Let's examine the costs for other current reactor projects.

The current cost of Areva's 'new generation' reactor being built in Finland is \$6250 per kilowatt.

Moody's Investors Service (Bond Rating Agency) estimates that the cost of a new 1,000-megawatt reactor will cost \$7.5 billion or \$7500 per kilowatt. Progress Energy Florida estimated that building reactors at a new 3,000-acre site in Levy County near Tampa, Fla., would cost about \$7 billion per unit (Westinghouse AP1000) or \$7000 per kilowatt.

Florida Power & Light estimates the cost of adding new reactors at Turkey Point nuclear plant could range from \$6-\$12 billion per reactor, according to a March filing with Florida regulators. The company said the cost for building two units ranges from \$12.1 billion to \$17.8 billion for Westinghouse's AP1000, and \$16.5 billion to \$24.3 billion for General Electric's ESBWR.

The average construction costs from the examples above is \$7650 US or \$9562 Cdn. per kilowatt. As such, the four 1000 megawatt reactors Bruce Power wants to build will cost about \$38.25 billion Cdn. This is about three-and-a-quarter times as high as Bruce Power's estimate of costs. Curiously, this is virtually the same percentage cost overrun as AECL had at Darlington.

These figures will continue to rise at about 10% per year because of the continued escalation in the cost of labour and materials as all large industrial projects under construction can attest. The cost estimate for reactor construction has more than doubled in the past five years. If we assume a 10% yearly increase in construction costs, the \$38 billion price tag for the four reactors proposed for Peace River will rise to more than \$55 billion within five years.

How much is a Billion Dollars?

It is hard for most of us to wrap our heads around large numbers. Let's look at the difference between Bruce Power's estimate to build four reactors and what everybody else is saying its going to cost. Bruce Power's figure of \$12 billion is \$26 billion less than the \$38 billion the industry estimates. In other words, Bruce Power is looking for a \$26 billion taxpayer subsidy.

If we took one billion dollars, we could spend \$2000 on 500,000 homes to increase their energy-efficiency levels. If we spent this money on the most inefficient homes, we would reduce their energy consumption by 30-45%. If the government funded this program instead of nuclear reactors, homeowners would be able to repay the \$2000 costs through energy savings alone in less than three years. The government would have its billion dollars back and half a million homes would consume about 35% less energy.

This type of program is common for commercial and institutional buildings, including the Canadian government's Federal Building Initiative program. An energy service company does an audit on the buildings and reports on suggested upgrades to water, electrical, heating and waste systems. He informs the building owner what it will cost and the amount the changes will reduce the building's operating cost. If the building owner decides to go ahead, they enter into an Energy Services Contract (ESCO) with the energy services company. The energy services company does the work without the owner of the building incurring any capital costs. The energy service company is repaid through the savings in energy costs. Average length of payback is 2-6 years.

The four reactors being proposed will generate 4000 megawatts of electricity at a cost of \$38 billion and will not be completed for a minimum of ten years. Installation of 4000 megawatts of wind generated electricity would cost \$7 billion and could be installed within 2 years. At the end of their lives, the wind turbines are simply un-bolted from their foundation and the materials recycled. There are no legacy wastes of any kind to deal with. Nuclear reactors have to be refurbished, decommissioned and stored away from people for tens of thousands of years. The cost of an accident at a windmill is minimal. A major accident at a reactor could cost Canadian taxpayers a trillion dollars.

There are many more efficient and beneficial ways to spend a billion dollars than building nuclear reactors.

Three Reactors to Choose From

Atomic Energy of Canada Limited's ACR-1000, Areva's EPR and Westinghouse's AP-1000 are the three reactor models being considered by the Ontario government and by Bruce Power. Only Areva's EPR reactor has actually been fully designed yet.

Areva (France) started building the first EPR in Finland in 2005. It is currently three years behind schedule and 50% over budget because of poor welding, flaws in piping and mistakes with concrete pouring. Costs expected to rise further before the project is complete. Many of the problems are being blamed on a work force that is not suitably trained for the work they are doing.

Areva started building the second EPR reactor at Flamanville France in December 2007. The French Nuclear Safety Agency (ASN) shut down the project six months after it started (May 21, 2008) after finding cracks in the slab beneath the reactor building and non-conformities in steel re-enforcing for the concrete among many other deficiencies. A quarter of the welds were not up to standards. The entire reactor site was shut down for a month before work was allowed to resume.

The Westinghouse AP-1000 is nowhere near ready for construction. The United States Nuclear Regulatory Commission says that design approval will not come until 2012. Harvey Wasserman states: "The plans for these reactors have not been finalized by the builders themselves, nor have they been approved by the regulators. There is no operating prototype of a Westinghouse AP-1000 from which to draw actual data about how safely these plants might actually operate, what their environmental impact might be, or what they might cost to build or run."

Atomic Energy of Canada Limited's (AECL) ACR-1000 is an even more dubious reactor. It is based on AECL's aborted ACR-700 reactor which the United States Nuclear Regulatory Commission determined did not operate as AECL claimed. The ACR-1000 is still on the drawing board and is years away from licensing. The ACR-1000 is a radical departure from the traditional Candu reactors.

Greenhouse Gas Emissions

Nuclear proponents continually try to paint nuclear as a green technology because there are no greenhouse gases emitted during the operation of the reactor. This is true but they neglect to mention that the reactors emit large quantities of tritium. Tritium is radioactive water capable of contaminating people, animals, plants and water systems. Tritium is a known carcinogen.

Though the reactors do not emit greenhouse gases, every other part of the nuclear fuel cycle does. Diesel is required in mining and hauling ore from Saskatchewan to Blind River, to Port Hope and then on to the reactors. All of the facilities are built of concrete which is a huge emitter of greenhouse gases. Cameco is the largest user of concrete in Saskatchewan; most of it for plugging leaks in their mines. More diesel will be used during decommissioning to haul all the waste around. As stated previously, one uranium enrichment facility requires the electrical output of two 1000 megawatt coal-fired generators.

The nuclear proponents then say that even taking all of that into consideration, nuclear releases less greenhouse gases than coal or oil and that they have the studies to prove it. Once again, this is true. But they don't tell you that the study is based on the ore from the richest mines in the world at up to 70% uranium oxides in the ore. If low-grade ore from other mines (.01% uranium oxides in the ore) was used, you would have to process 7000 times as much ore to get the same amount of uranium. This would cause the release of a great deal more greenhouse gases than other energy sources would.

Nuclear Reactors in Alberta

Alberta became the target for the hopes and dreams of the nuclear industry in 2007 when an Alberta company called Energy Alberta announced they wanted to build two reactors in the province. Wayne Henuset and Hank Swartout formed the company in 2006 and negotiated exclusive marketing rights to use Atomic Energy of Canada Limited's Candu technology.

They narrowed their search for a site to build the reactors to Whitecourt and Peace River and said the electricity would be used by the oilsands companies for their extraction process. This made little sense as the oilsands companies are located on the other side of the province from the proposed reactors. The distance between the oilsands projects and the proposed reactors would prevent the use of the excess heat from the reactors.

The existing oilsands companies stated they were not interested in using nuclear power as they all have their own gas-fired co-generation units which supply both the electricity and the steam they need for their extraction processes. The companies currently sell the excess electricity they generate back into the Alberta grid.

Mr. Henuset then announced that he had found a buyer for 70% of the proposed reactors output, though he would not name the purchaser. In the end, he admitted there never was a buyer.

Concerning land to build the reactors, Mr. Henuset is quoted saying: "There are other things that we need to do but we do have land as we speak now. I won't tell you where, but I will tell you I actually purchased it this week." (Whitecourt Star, August 22, 2007) Mr. Henuset later admitted that he had not purchased land.

Obviously, Mr. Henuset had a little trouble discerning the difference between fact and fiction. Energy Alberta was purchased by Bruce Power from Ontario in 2008.

Deceiving The Public

It's a sad commentary on our society when the institutions meant to protect and inform us become puppets of the industries that harm us. Our three levels of government and most of the newspapers serving Alberta have jumped into bed with the nuclear industry. Their efforts are compromising the best interests of Albertans, both now and in the future, to promote an industry that has created massive debt and contamination for Canadians for the past 40 years.

Albertans are only hearing what the nuclear industry wants them to hear. The massive resources of the industry, our governments and the media have been marshaled to control the information getting to the public. Individual residents and grass-roots organizations are having to dig into their own pockets to get the other side of the story out.

Nuclear Industry

Bruce Power, the company wanting to build reactors in Alberta, has publicly stated they have set aside \$50 million over the next three years to get their message out. The groups opposed to the reactors have virtually no money to work with to educate the public about the health effects and accumulated public debt caused by the nuclear fuel cycle companies in Canada.

Much of the information being put out by Bruce Power in the media and in public meetings is false but there is no mechanism in place to hold them accountable. I brought this to the attention of the Canadian Environmental Assessment Agency (CEAA), the Canadian Nuclear Safety Commission (CNSC) and other officials in the federal government after attending an information session put on by Bruce Power on March 14, 2008 in Fairview. I listed the false statements they made during their presentations and asked that some action be taken to force Bruce Power to tell the public the truth. The only response I received was from Peter Sylvester of the CEAA who stated: "Thank you for your email message of May 7, (2008) requesting further clarification regarding federal responsibilities in relation to public comments made by private sector proponents, such as nuclear fuel cycle companies. While the Canadian Environmental Assessment Agency advocates an open and transparent environmental assessment (EA) process, it is not within the federal government's legislative authority to control the public consultation activities of a private sector proponent."

Unfortunately, there are no laws in place to force companies in Canada to tell the truth to the public.

With the Federal and Provincial governments avoiding their responsibilities, it is up to the media and the public to ensure we are being told the truth by energy companies. I hope we are both up to the challenge. If not, our children and grandchildren will suffer the consequences.

Municipal Government

The Alberta Association of Municipalities, Districts and Counties (AAMDC) sponsored the Rural Matters Conference July 5-8, 2008 with Patrick Moore as the keynote speaker. Patrick Moore is a former Greenpeace member who now works as a paid lobbyist for the nuclear industry. Several social justice and environmental organizations voiced concerns to AAMDC that no one would be present to give balance to his presentation in support of the nuclear industry. AAMDC responded to our concerns with the following e-mail:

"We received your note today. As to the concerns raised please be advised that Dr. Moore has not been booked as a speaker to make a presentation on Nuclear energy. We have booked him to speak on the broader topic of the importance of environmental sustainability." (Gerald Rhodes, Executive Director, AAMDC/Alberta Association of Municipal Districts & Counties)

But as we feared, Patrick Moore did give a pro-nuclear presentation. Candace Elliot of the Edmonton Journal reported on his address to the conference: "If Alberta really wants to turn around its extremely high CO2 level, which is seven times higher than Quebec's, it's got to consider either building hydro dams in the north or building nuclear plants in order to stop the continued increase in fossil fuel consumption," said Moore. "It's the only practical means of reducing greenhouse gas emissions in Alberta's oilsands." (Edmonton Journal, July 8, 2008)

Had Patrick Moore deceived the AAMDC about the nature of the talk he would give or was the response we received from Gerald Rhodes at AAMDC a deception? Either way, Patrick Moore fulfilled his obligations as a paid nuclear lobbyist. The delegates to the conference went away after hearing only one side of the story.

However, the award for 'municipal manipulation' has to go to Whitecourt Mayor, Trevor Thain. Many people in the community had been clamoring for debates, so the mayor decided to accommodate them. Mayor Thain submitted the names of the debaters to the local radio station in a press release. Unfortunately for Mayor Thain, the reporter at the radio station recognized both individuals as being pro-nuclear. The Mayor was suitably chastised and was forced to find a substitute for one of the pro-nuclear 'debaters'. I imagine the people of Whitecourt will remember this example of the mayor's 'ethical conduct' come the next election.

Provincial Government

During the provincial election in March 2008, Energy Minister Mel Knight was adamant that the provincial government 'was neither a proponent nor a detractor of nuclear power.' In reality, the Alberta government had already made up its mind and Mel Knight was not telling the truth.

Natural Resources Minister Gary Lunn's comments in the Whitecourt Star leads one to believe that the Alberta government had made up its mind almost a year before the election to support the development of nuclear power in Alberta. Mr. Lunn states: "We need clean forms of energy. We need to invest in technology for the fossil fuels that are going to be around for decades, but also nuclear has a role to play if certain provinces want to move in that direction. If they decide to move forward – and I am hearing very positive information from local governments, and the provincial government – ultimately it is their decision – that we will ensure that there is a comprehensive approval process that is put in place." (July 18, 2007, Chandra Lye) Peace River Mayor Lorne Mann also contradicts Mel Knight's assertion that the Alberta government didn't have its mind made up. "Mr. Mann said nuclear power was inevitable for Alberta. The impression I get from the feds and the province is that this may well be the first but it certainly won't be the last," he said in regards to Energy Alberta's (EA) plans to build a plant in Northern Alberta. "It's a train coming down the railway tracks and the usual suspects will object but in our due diligence it's very positive for Alberta's economy." (Whitecourt Star Staff, Wednesday August 22, 2007) It appears Mr. Knight visited the Idaho Nuclear Laboratory prior to the election. Three weeks after he was re-elected, Mr. Knight announced a joint venture between the Alberta Research Council and the Idaho facility to research and develop uses for nuclear technology in the oil patch.

It's quite apparent that the three levels of government have had discussions concerning the construction of nuclear reactors in Alberta and that the province is supportive. Mel Knight did not tell us the truth during the election so he could avoid all debate on such a divisive issue.

The Nuclear Panel

Alberta Energy Minister Mel Knight announced the formation of 'An Expert Nuclear Panel' to investigate whether nuclear energy is appropriate for Alberta. The panel was set up to help the province answer questions on environmental, health, safety and waste management issues. On the surface, these goals are laudable, but they cannot be fulfilled because of the people Mel Knight appointed to the panel.

There are no environmental experts, medical doctors, nuclear opponents or health experts. The panel is made up of three 'oil and gas men' and a director of Atomic Energy of Canada Limited, the main proponent of nuclear energy in Canada. As a result, the report from this panel will have no credibility.

The panel consists of former federal cabinet minister Harvie Andre, Joseph Doucet (Enbridge Professor of Energy Policy), Harrie Vredenburg (business

professor and Suncor Energy Chair at University of Calgary) and John Luxat (McMaster University professor and AECL Director). Harvie Andre was appointed to chair the committee despite having no expertise in environmental, health, safety or radioactive waste related issues. He was appointed in the same capacity by the Canadian Nuclear Safety Commission to chair the panel investigating the construction of new reactors in Ontario. His main qualification is that he's loyal to the federal government's intention to make the nuclear industry grow in Canada. The hypocrisy of this panel was clearly shown when Dr. Helen Caldicott, one of the world's foremost experts on the health consequences of exposure to radiation, offered to meet with the panel on a recent visit to Canada from Australia. Harvie Andre refused her offer because she is a 'biased advocate.' The panel unanimously agreed it won't "entertain requests from proponents or opponents of nuclear power." The panel's bias is evident considering John Luxat is a director of AECL and has been involved in the nuclear industry for more than 30 years.

Alberta Energy Minister Mel Knight

I will have to defer to Edmonton Sun columnist Neil Waugh for a succinct description of Mel Knight. In his July 2008 column in the paper, Mr. Waugh stated: "Alberta Energy Minister Mel Knight may have won the race to the bottom with Environment Minister Rob Renner as the PCs' worst cabinet minister."

Mel Knight was the Minister of Energy when the Alberta Energy and Utilities Board were caught spying on landowners who were opposing the electrical transmission lines being proposed in Alberta. Mel Knight ended up splitting the Board into two separate boards but did nothing to reprimand the Alberta Energy and Utilities Board employees who had broken the law. Just another simple case of covering up corruption in the provincial government.

Mel Knight showed his ignorance of nuclear issues on April 24th, 2008, when he made the following comment in the legislature in response to a question about the nuclear panel he had convened: "It might be very interesting for the member opposite to understand that one of the ... major forces working with respect to environmental concerns globally, the Sierra Club, runs ads in Europe in favour of nuclear energy, Mr. Speaker, in favour of nuclear energy."

Lindsay Telfer, Director of the Sierra Club Prairie responded: "The Sierra Club Canada, in addition to the Sierra Club US have clear policies which highlight our belief that Nuclear Energy is not clean, it is not green, it is not economical and it is not a solution to climate change. The fact that our Energy Minister Mel Knight is resorting to slander in an attempt to discredit our organization is simply unacceptable. Our positions on nuclear energy are based on sound science, clear evidence and a growing body of literature on the industry's impacts."

Ms. Telfer continues: "We expect a public apology in the legislature in addition to a meeting with Minister Knight to clear this claim on the Alberta Record. We believe we can work with the Government of Alberta to develop an energy policy that meets its own stated principle to lead in the post-oil economy, and we believe we can achieve this without resorting to the risks of nuclear energy."

Shortly after he announced the 'Expert Nuclear Panel,' Mel Knight was asked by a group of youth from SPOC (Stop Poisoning Our Community) outside his office if he could tell them what the panel was supposed to report on. Mel Knight said they would find out when the report was released in the fall. Mel Knight also refused to release the terms of reference for the panel when the youth asked him to do so.

Mel Knight betrayed his lack of nuclear knowledge when he rose in the legislature on March 19, 2009 and said: "Mr. Speaker, I certainly did indicate that there is a nuclear renaissance, and it is global. I didn't talk about a renaissance in Alberta, but I did say that there is a nuclear renaissance, and it's global. It's here; whether we like it or whether we don't is not the issue. There are a number of jurisdictions around the world that are currently increasing their capacity for nuclear energy. Relative to the treatment of spent fuel, recycling of spent fuel is a technology that's well applied in certain places in the world and certainly is way beyond, obviously, what the member opposite understands."

There is no nuclear renaissance in the world right now. There has not been a single firm order for a reactor in North America since 1978. The only two reactors under construction in the western world ordered in the past decade are in Finland and France. One is three years late and 50% over budget while the other one was shut down for a month because of work deficiencies.

Mel Knight says that: "recycling of spent fuel is a technology that's well applied in certain places in the world." As I've shown in a previous paper, the reprocessing of spent reactor fuel has been a costly and toxic disaster wherever it has been tried.

Mel Knight's next comment that day in the legislature was: "There is no nuclear waste in Alberta, not that I'm aware of, in any event." For Mel Knight's information, there's 42,500 cubic metres of radioactive waste stored in Fort McMurray. This material was placed in a mound in the early 1990's. It originated from the 1930s to the 1960s when radioactive uranium ore was shipped from Port Radium through Fort McMurray to Port Hope for refining. There is most definitely other contaminated sites along the transportation route.

Considering his ridiculous and false comments on nuclear issues, Mel Knight is not qualified to be Alberta's Energy Minister. He has no grasp whatsoever of the dangers or the costs involved with the expansion of the nuclear industry. Considering Bruce Power's attempt to build nuclear reactors in Alberta, the health and economic well-being of Albertans are at risk because of Mel Knight's complete incompetence regarding nuclear issues.

Deceit from the Media

The changes in the newspaper business over the past 25 years have been detrimental to Canadian citizens. Our communities have suffered because of the concentration of too many newspapers in too few hands.

For instance, the Grande Prairie Herald Tribune is owned by Quebecor, a company based in Montreal which owns hundreds of newspapers across the country. Newspapers owned by people who live far away do not have the best interests of the community at heart. They are concerned about the people who pay for advertising across the chain. Their editorial policies are driven by the corporations they serve and are a part of.

The Quebecor chain of newspapers take a pro-nuclear stance in their reporting. As such, small communities across the country are only given information the nuclear industry wants them to get.

Does Alberta Need Nuclear Reactors?

Alberta's peak electricity demand is just under 10,000 megawatts (mw.) which is currently being met with 12,000 megawatts of generating capacity from all sources in the province. Alberta also has agreements in place to buy electricity from British Columbia and Saskatchewan if needed.

In 2007, the Alberta Electric System Operator (AESO), estimated Alberta will require an additional 5000 mw. of electricity generating capacity within 10 years and 11,800 mw. within 20 years. This forecast will have to be revised as the AESO has since stated that the projected increase in demand for 2007 and 2008 has not materialized. Further, we have entered a severe global recession that has already forced the cancellation of a large number of energy intensive projects.

A large percentage of the projected increase in demand will be used for new oilsands projects and other major industrial enterprises. These large projects usually install their own electricity generating facilities on site. Most of them use natural gas co-generating units which produce both electricity and the steam required for oilsands recovery and other industrial processes. Roughly half of the projected increase in demand for the next ten years will be met in this manner.

This will leave AESO to approve about 2500 mw of generating capacity to meet demand for the next ten years. AESO reports they have received proposals for 17,823 mw of generating capacity; 10265 mw of which is for wind power generation.

AESO's long-range projection of 3% annual growth may change over the ten-year period because of a number of different factors. In Ontario in the 1970s and 1980s, Ontario Hydro forecast electricity demand growing at 3% per year. They used this forecast to justify the construction of nuclear reactors and other electricity sources. The actual increase in demand in the following 20 years was 1%.

There is a 'monument' in Port Hope that is a constant reminder of the Ontario Government's inability to forecast accurately. The Wesleyville 2000 mw oil-fired power station in the west end of Port Hope was more than half built when the announcement came that it would not be put into service. Its 208 metre high smoke stack is visible for miles around.

Energy Alberta initially claimed the nuclear reactors they wanted to build would supply energy to the oilsands but the current oilsands companies said they weren't interested in using nuclear power for their operations as they have their own natural gas co-generation units. Further, locating the reactors in Peace River would be of little benefit to the oilsands 600 kilometres away as steam can only be transported about 25 kilometres.

The oilsands companies don't want the reactors that close to the oilsands for fear of contaminating these vast deposits with radioactive material.

There is no need to build nuclear reactors in Canada. Future demand can be met through renewable energy sources, increased energy-efficiency and conservation. The current round of reactor proposals is simply a commercial venture to sell electricity to the Americans. The only exception would be Ontario which does have a tight supply of electricity because so many of their reactors have been shut down for such a long period of time. If these reactors were operating as AECL said they would, Ontario wouldn't have a problem.

Global Nuclear Energy Partnership

Canada signed on to George Bush's Global Nuclear Energy Partnership (GNEP). The GNEP stipulates that spent reactor fuel from around the world will be returned to the country that supplied the uranium in the first place. The waste reactor fuel will be reprocessed to be used in a new generation of reactors that haven't been designed yet. This is of great concern to Canadians as we are the largest supplier of uranium in the world. 40% of all the reactor waste in the world will be returned to Canada for reprocessing. This will create a whole new level of radioactive waste we will have to store and dispose of.

The industry controlled Nuclear Waste Management Organization in Canada estimated it will cost \$25 billion to store Canada's current volume of waste from its 20 operating reactors and no community has agreed to play host to the waste yet. How big will this problem get when we start receiving high-level radioactive waste from 175 reactors (40%) around the world?

The Canadian government wants to locate a reactor in a western province to make it easier to sell the public on building a waste processing facility here. There will be less opposition in the west to the vast high-level waste storage facility that will be required to deal with 40% of the world's spent reactor fuel. Further, as much of the returning waste will be coming from Asia, it would be easier to transport the high-level waste from ports in British Columbia than from eastern Canada.

When will the Canadian government stop this madness?

Where Do We Stand?

"I write this mostly for my children. One day they will have questions. One day I might have to explain how we came to this place in time, where we have nuclear bombs, radioactive waste, spent fuel rods, genetic deformities and wastelands. My stories are about uranium. But they are about something more than a radioactive mineral. My stories are about people and about oppression, about fear and corporate colonialism and about hope." (Lorraine Rekmans, This is My Homeland)

We sit at a critical time. The decisions we make now will affect all future generations for tens of thousands of years. What right do we have to create problems that our children and grandchildren have no hope of solving? What right do we have to use electricity that puts the health, environmental and economic costs on to our children and grandchildren?

Radioactive uranium ore was mined and processed in Canada since 1932. Despite knowing the dangers from the beginning, the Canadian government never told the tens of thousands of men and women who worked in the industry of the harm they faced for 45 years. We have no way of knowing how many needless illnesses and premature deaths were caused by Canada's policy of silence. But we do know from all the miners' health studies that cancer rates were at double the number expected.

Canada poisoned an unsuspecting First Nations community in Deline to use them to transport radioactive ore.

In 1966, the Atomic Energy Control Board, the Town of Port Hope officials and the RCMP were told of the dangers of the radioactive waste located throughout the town by Dr. Andrews. The three organizations stayed silent for ten years before the public was informed of the dangers. How many excess illnesses and deaths did this cause?

Canada sent its soldiers to be exposed to atomic weapons testing with the full knowledge of the dangers they faced. Canada also sent soldiers to clean up the major accidents in the NRX and NRU reactors. No health followup was ever ordered.

The cancer rates in Fort Chipewyan's recent health studies were judged to be a concern when they were 30% higher than expected. Yet Health Canada found 'no problem' with brain cancer in children in Port Hope 300% above the expected rate or respiratory cancers in men 460% above the expected rate.

Canada's allowable level for tritium (7000 Bq/L) is 70 times higher than in the European Union (100 Bq/L). Canada must set tritium levels this high because the CANDU reactors produce 30 times more tritium than any other reactor in the world. This regulatory level is set to protect the industry, not the health of Canadians.

Health studies have shown cancer and leukemia rates around reactors are significantly elevated. The most recent studies have shown these rates drop quickly once the reactors are shut down.

There are hundreds of millions of tonnes of radioactive waste currently poisoning people and the environment in Canada. No country in the world had found a solution to dealing with these wastes.

Canadian taxpayers are still paying for the massive cost overruns and radioactive waste cleanups from the first round of reactor construction. Do taxpayers want to do this again?

The Canadian government is responsible for these atrocities. They were first warned of the dangers of uranium and radiation by their own Department of Mines Ministry in 1932. The Canadian government knowingly poisoned its citizens. There is no other way of saying it: The Canadian government is guilty of nuclear genocide. The Canadian Nuclear Safety Commission, Health Canada and Natural Resources Canada are all lying to Canadians about the dangers they face from exposure to radiation. They are doing this to prevent the government from being held accountable for the harm they have caused.

Where Do We Go From Here?

"In Germany, they first came for the communists, and I didn't speak up because I was not a communist. Then they came for the Jews, and I didn't speak up because I wasn't a Jew. Then they came for the trade unionists, and I didn't speak up because I wasn't a trade unionist. Then they came for the Catholics, and I didn't speak up because I wasn't a Catholic. Then they came for me, and by that time, there was nobody left to speak up." (Martin Niemöller)

Martin Niemoller was a priest who was imprisoned in Germany from 1938-1945 for his outspoken opposition to Hitler. He wrote the statement above upon his release from prison to voice his disgust at the cowardice of his fellow Germans in not speaking up against Hitler. Sadly, we face the same situation in Canada regarding nuclear issues. More people must get involved in the debate. More people must stand up and speak out to protect future generations who aren't here to defend themselves.

There's a small group of people across Canada who work tirelessly to research and expose the truth about the dangers we face from the nuclear industry; past, present and future. They sacrifice thousands of hours of their personal time and their own resources to try to protect Canadians. They come from all walks of life and over 80% of them are women. This situation has been talked about at considerable length and it appears that men simply don't have the courage to stand up and speak out while the women will do whatever is required to protect their children.

Very few of these people are nuclear experts. You don't have to be an expert to understand what the nuclear experts are saying. You just have to understand the language the experts are speaking in. The biggest problem we face is figuring out which expert is telling the truth. As the tobacco debate demonstrated over the years, you can get an expert or a scientist to say whatever you want if you pay them enough money. The same situation exists within the nuclear debate today.

What are you going to say to your children and grandchildren when they ask you how we got into this mess? Will you be able to tell them that you did your part to prevent it? Will you be able to tell them that you stood up and looked out for their best interests? I hope so.

Each of us must look in the mirror and see what we can do to help out. Call a local group and find out how you can get involved. Call your Member of Parliament or your MLA and tell them your concerns. Go to a public meeting. Write a letter to the newspaper. At least then you'll be able to look your children in the eyes when they asked what happened.

In Closing

There was a great deal more information that could have gone into this series of papers, but I ran out of time. I wanted to get this information out before Bruce Power held their four public meetings this week in the Peace River area. Nuclear power involves much more than just the reactors. We have to be aware of the impact of all the parts of the nuclear fuel cycle.

Most importantly, we must be aware that it was the Canadian government that caused the mess we find ourselves in. They did not protect us from all parts of the nuclear fuel cycle. We must do all we can to ensure they don't do it to us again.

Thank You,

Pat McNamara March 22, 2009

[Here](#) is a link to an article by Harvey Wasserman about France's nuclear power industry. It gives an insight into the true status of the 'nuclear renaissance.'

VANDALS STRIKE

Pat McNamara May 2009

The nuclear debate in Peace River is no longer peaceful.

Pro-nuclear vandals attacked a 40 foot trailer used by nuclear opponents to get their message out. The pro-nuclear vandals painted a swastika and profanity on the side of the trailer. They also threw a Molotov cocktail (gas bomb) to further destroy the sign.



The damage to the trailer was bad enough but the situation could have been much worse. They cut a farmer's fence along highway 743 to get at the trailer. The horses in the field might have gotten on the highway and been involved in a collision with a vehicle.

It was fortunate that the flames from the Molotov cocktail did not ignite the surrounding dry grass as the ensuing fire could easily have travelled to the farmer's home which was only 200 feet away. A fire could have spread a long way before anyone noticed as the vandals attacked in the middle of the night.

This attack on our message came a day after two nuclear opponents received a death threat because of letters they wrote to the newspapers voicing their concerns about the impact the nuclear reactors will have on their farms.

The RCMP is investigating both occurrences.

Bruce Power announced they have set aside \$50 million to promote this project. Grass-roots organizations and community residents have virtually no resources to publicise the nuclear information that Bruce Power doesn't want the public to know about. The trailer that was attacked by 'pro-nuclear vandals' used up the majority of our resources.

Peace River residents are being asked to be the nuclear sacrifice zone for Alberta, yet the local, provincial and national media have provided scant

coverage of our concerns. This week, it was vandalism and death threats.
Will someone have to be hurt or killed before our struggle becomes newsworthy?

COMMENTS ON MEL KNIGHT'S NUCLEAR POWER REPORT

Pat McNamara April 2009

In May 2008, Alberta Energy Minister Mel Knight announced the formation of 'An Expert Nuclear Panel' to investigate whether nuclear energy is appropriate for Alberta. The panel was set up to help the province answer questions on environmental, health, safety and waste management issues surrounding nuclear energy.

The report released by Mel Knight last week did not answer any of these questions. Instead, the report was little more than a nuclear industry advertisement on behalf of nuclear reactors and the merits of reprocessing spent nuclear fuel. Considering its purported mandate, the Expert Nuclear Panel Report is fraudulent, incomplete and biased.

In reality, we couldn't expect anything else considering the makeup of the panel. Harvie Andre was appointed to chair the committee despite having no expertise in environmental, health, safety or radioactive waste related issues. There were no environmental experts, medical doctors, nuclear opponents or health experts on the panel at all.

The balance of the panel consisted of two business professors from Alberta universities and a director of Atomic Energy of Canada Limited. The panel was advised on nuclear issues by the Idaho National Nuclear Laboratory from the United States.

Even by Mel Knight's dubious standards, this report is a slap in the face of democracy and the people he was elected to serve.

Reactors

The report says new reactor designs are safer, more efficient and easier to control and operate. Yet the report makes no mention that two of the three reactor types being considered in Canada have not even been completely designed yet, much less gone through the regulatory process to determine their level of safety.

The United States Nuclear Regulatory Commission says that design approval for the Westinghouse AP-1000 will not come until 2012 at the earliest. Atomic Energy of Canada Limited's ACR-1000 is an even more dubious reactor. It is based on AECL's aborted ACR-700 reactor which the United States Nuclear Regulatory Commission determined did not operate as AECL claimed. The ACR-1000 is still on the drawing board and is years away from licensing.

How can the 'Expert Nuclear Panel' say these reactors are safer and more efficient if the nuclear regulators haven't determined if they work yet?

The only Generation 3 reactors being built are by Areva. They started building their first EPR reactor in Finland in 2005. The project is currently three and a half years behind schedule and 55% over budget because of poor welding, flaws in piping and mistakes with concrete pouring. The nuclear regulator in Finland had issued over 2000 citations to Areva for work deficiencies. Siemens, the German engineering firm is pulling out of the project which will cost Areva \$2 billion. Further, the Finnish government has started a \$4 billion legal action against Areva to cover replacement electricity and Green-credit costs as a result of the project being so far behind schedule.

Areva started building the second EPR reactor at Flamanville, France in December 2007. The French Nuclear Safety Agency (ASN) shut down the project six months after it started (May 21, 2008) after finding cracks in the slab beneath the reactor building and non-conformities in steel re-enforcing for the concrete among many other deficiencies. A quarter of the welds were not up to standards. The entire reactor site was shut down for a month before work was allowed to resume.

On page 42, the report states that nuclear reactors are designed to safely withstand man-made and natural destructive forces, including earthquakes. However, the report makes no mention of the seven reactors in Japan that were damaged and shut down as the result of an earthquake two years ago. The Kashiwazaki-Kariwa power plant is the largest complex in the world. As with Alberta's 'Expert Panel,' the Japanese experts assured the Japanese public that earthquakes could not harm the reactors.

None of this information was included in the 'Expert Nuclear Panel's Report.'

Neutron Radiation

On page 37, the report discusses the relative dangers of alpha, beta and gamma radiation. But no mention is made of neutron radiation which is the most dangerous form.

"Neutrons readily pass through most material, but interact enough to cause biological damage. Due to the high kinetic energy of neutrons, this radiation is considered to be the most severe and dangerous radiation available. Another, sometimes more severe, hazard of neutron radiation is neutron activation, the ability of neutron radiation to induce radioactivity in most substances it encounters, including the body tissues of the workers themselves." (Wikipedia)

Neutron radiation is present at the reactors and during processing of UF₆ (uranium hexafluoride) in Port Hope.

Low-Level Radioactive Waste

The report's brief discussion of low-level radioactive waste states that the radiation levels in this material are very low. This is simply not true. The term 'low-level' denotes the origin of the material, not the level of radiation. Low-level radioactive waste can be very highly radioactive. Several sites are briefly discussed but no mention is made of the massive quantities of low-level radioactive waste in Port Hope, Pinawa and Chalk River.

The report makes no mention of about 400 million tons of radioactive mine tailings at the uranium mines in Ontario, Saskatchewan and the North West Territories. For instance, at Serpent River Ontario, the tailings from 12 mines were dumped into ten lakes near the mines. The radioactive tailings killed all ten lakes and 55 miles of the Serpent River. The Serpent River is literally a river of poison from the dead lakes to Lake Huron.

Radiation Hormesis

The only discussion of health impacts from the nuclear industry concerned the impact of low levels of radiation on people. The report put forward the belief among many in the nuclear industry that small amounts of radiation are good for you, which is called 'radiation hormesis'. No mention was made of the findings of the BEIR 7 Report from the United States National Academy of Sciences which states that there is no safe level of radiation. The BEIR 7 Report further states that there is no scientific evidence to support the industry's belief in radiation hormesis.

There is no mention of any of the reports which show elevated rates of cancers and leukemia in people living close to reactors.

Environmental Impacts

According to the report: "Environmental impacts arise from periodic blow down discharge of water containing chlorine and other chemicals used to control corrosion and the accumulation of microbes and minerals." There is no discussion in the report about the nature of these 'other chemicals' or of the environmental impact they have.

There are no other environmental consequences of the nuclear fuel cycle spoken to in the report.

Water Usage

The report states that 17 million cubic metres of water per year would evaporate from the cooling tower of an 800 megawatt reactor or 21,250 cubic metres of water per year per megawatt. Bruce Power estimates that 113 million cubic metres of water will evaporate from the cooling towers for four 1000 megawatt reactors or 28250 cubic metres of water per year per megawatt.

Bruce Power's estimate of water usage is 33% higher per megawatt than the figure cited in the report.

Why is there such a large discrepancy?

Who is right?

Community Education

The report states: "there is a need for the citizens of Alberta to have a reasonable understanding of the issues and concerns associated with nuclear power plants."

I completely agree.

However, after reading this report and attending Bruce Power's open houses in the Peace River region March 23-26, it is very clear that the Alberta government, Mel Knight and Bruce Power cannot be relied on to give both sides of the nuclear debate.

Funding must be provided by the Alberta government and Bruce Power to allow nuclear opponents to give the other side.

Reprocessing Spent Reactor Fuel

There are multiple references throughout the report touting the benefits of recycling high-level waste from spent reactor fuel. However, there is no mention anywhere in the report that reprocessing has been an abject failure wherever it has been tried.

The process involves chopping up the highly radioactive spent fuel bundles and dissolving them in boiling nitric acid. The process causes the release of radioactive gases and the contamination of the nitric acid which has to be dealt with as high-level radioactive waste. The plutonium is separated from other radioactive products to be used to manufacture Mox (Mixed Oxide) Fuel for breeder reactors.

United States – Nuclear Fuel Services built and operated a reprocessing facility in West Valley, New York from 1966-1972. The facility processed 640 metric tonnes of spent reactor fuel while in operation and generated 660,000 US gallons (2,500 tonnes) of highly radioactive liquid waste. The waste must be stored in an underground carbon-steel tank for around 200,000 years before it loses its radioactive potency. There was four times as much radioactive waste after reprocessing as there was before. The State of New York commissioned a study on the West Valley site and found out it would cost between \$9-\$27 billion to clean it up. This runs contrary to the Expert Nuclear Panel Report that claims the amount of radioactive waste is reduced through reprocessing.

In 1971, the Clinch River Breeder Reactor (US) was estimated to cost \$400 million. When it was finally cancelled in 1983, \$8 billion had been spent on it.

France – "A July 2000 report commissioned by the French government concluded that reprocessing was uneconomical - costing about \$25 billion more than a 'once through' fuel cycle - and will do little to reduce the amount of long-lived radionuclides in the waste." (Public Citizen - Nuclear Waste Reprocessing) Reprocessing in France has severely polluted the English Channel.

The Superphenix Breeder reactor was started in 1981 and was shut down in 1997. It produced very little electricity during its final ten years because of breakdowns. By 1996, it was estimated the reactor cost more than 9 billion Euros.

England – It appears as if Britain is going to close the Sellafield Mox Plant after ten years of troubled operation. The Mox production plant cost almost a billion dollars to build when it opened in 1999 and has never worked properly. Further, it was hit by scandal concerning quality control and falsification of documents from the start. They were never able to regain business from the Japanese they lost as a result.

"These discharges go into the sea, the surrounding countryside, the air and into us. Sellafield's waste discharges have made the Irish Sea the most radioactively contaminated sea in the world and its waste has been washed up on shores as far away as Greenland. Sellafield's pollution is found in the sea spray, soil, vegetation and bodies of animals and in people's homes. There are areas around Sellafield that are as radioactive as the land in the 'exclusion' zone around the stricken Chernobyl nuclear reactor." (Greenpeace, UK)

Japan – In March 2009, Japan Nuclear Fuels Limited (JNFL) announced the 16th delay in completing its Rokkasho Reprocessing Plant which was originally scheduled to open in 1997. The \$20 billion price tag for the project is about three times what was estimated when the project started in 1993. Japan's Monju fast breeder reactor has been shut down since 1995 because of severe safety concerns.

Reprocessing has caused massive contamination of the Irish Sea from Sellafield, the English channel off the French coast from the La Hague reprocessing plant and in West Valley New York.

Reprocessing is not economical and you end up with several times as much waste as you started with. The fact that most of it is liquid waste further adds to the challenges of containment.

Missing Information

- No mention was made of the demise of the plan to dispose of high-level waste at Yucca Mountain in the United States. There is no site designated in Canada either.
- No mention was made that Canadian taxpayers would be responsible for 99.9% of up to one trillion dollars in damages in the event of a major accident.
- No mention was made of a site to dispose of decommissioned reactors, nor a time frame for doing so.
- No mention was made of reactors costs or who would be responsible for cost overruns.
- No mention was made of the billions of dollars in costs and liabilities Canadians are responsible for from the last round of reactor construction in Canada.
- No mention was made of the health studies showing elevated rates of leukemia and cancers around nuclear reactors.
- No mention was made about reprocessing contamination or that all breeder reactors built to date have been shut down for safety issues and high costs.
- No mention was made of elevated tritium levels if CANDU technology was chosen.
- No mention was made as to which regulatory body would deem these new reactors safe to operate. The CNSC does not have the regulatory statutes in place nor the technical expertise to determine whether a reactor is safe to operate.
- No mention was made of any of the negative aspects of nuclear energy.

Blatant Hypocrisy and Bias

The Report states: "This report is intended to be an unbiased compilation of scientifically accepted information underpinning the issues associated with nuclear power."

How can this aim be met when only pro-nuclear advocates are present on the panel?

The hypocrisy and bias of this panel was clearly shown when Dr. Helen Caldicott, one of the world's foremost experts on the health consequences of exposure to radiation, offered to meet with the panel on a recent visit to Canada from Australia. Harvie Andre refused her offer because she is a 'biased advocate.' The panel then announced that it had unanimously agreed it won't "entertain requests from proponents or opponents of nuclear power."

This came from a panel which includes a director of Atomic Energy of Canada Limited and consultants from the the Idaho National Nuclear Laboratory in the United States.

The Expert Nuclear Panel Report has little credibility because of the biased and inadequate information it contains, the exclusion of health and environmental considerations and in some cases, false information.

This report from Mel Knight is further confirmation of his disregard for the well-being and rights of Albertans in his support of large corporations.

Recommendations

- That Bruce Power and the province provide resources to grass-roots organizations to develop and present information to the public about nuclear power concerns not brought forward by nuclear proponents.
- That the CNSC establish a presence or a direct liaison to concerned community members. The concerns in the community must be addressed as they arise.
- That the current impacts of the proposal on the immediate community be tabulated, assessed and dealt with by Bruce Power.