

# **THE PROBLEM WITH NUCLEAR IS THE HORRENDOUS COST OF DECOMMISSIONING WORNOUT AND OBSOLETE REACTORS**

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## **Introduction**

The construction of a nuclear reactor is very complicated and very expensive, e.g. \$17 billion dollars over 12 years to build the 4 reactors at Darlington Ontario.

When the reactors are old and obsolete they must be shut down and then decommissioned. The tremendous radiation, heat, chemicals, and boiling water lead to corrosion and breakdown of metal pipes and core tubing. The inner machinery becomes highly radioactive and must be dismantled very carefully. This calls for robotic methods to dissect the radioactive equipment, and then to bury the pieces deep in the earth. The costs for this decommissioning are horrendous!

## **Britain**

Britain or the United Kingdom was the first to build nuclear reactors at Sellafield in England, with the first one starting up in 1956—some 42 years ago.

There have been 20 nuclear sites in Britain. A devastating fire in the Windscale reactor, one of three at Sellafield, raged for two days, spreading radiation over the countryside, and had to be shut down.

Several of the reactors at Sellafield are in the process of being decommissioned, and more are to come. It may take as long as 100 years to cool down and dissipate the radiation in these plants.

The costs of such careful deconstruction are escalating, so that in 2008, the cost of decommissioning Britain's aging nuclear plants has jumped, in two years, to reach a total of 73 billion British pounds, or \$132.5 billion US dollars. The cost of deconstructing the Windscale reactor alone was 117 million euros, or \$170.7 million US dollars.

(A Report by the National Audit Office, The Guardian, Jan 30,2008)  
([www.guardian.co.uk/environment/2008/jan/30/nuclear](http://www.guardian.co.uk/environment/2008/jan/30/nuclear) power energy)

## **United States of America**

The USA has constructed 80 nuclear reactors around the country, plus many weapons facilities. Currently, there are 13 nuclear power plants that have shut down, and some are in a phase of decommissioning. Some 19 nuclear power plants have completed the decommissioning process. Detailed costs have not yet been discovered, but The Ecologist (10/21/2006) stated: "In America, industry and government estimates for the cost of decommissioning have risen from an initial \$120million in 1991 to a staggering \$450 million." !

(“Fact Sheet on Decommissioning Nuclear Power Plants,” by  
The Nuclear Regulatory Commission, USA)  
[www.nrc.gov/reading-rm/doc-collections/factsheets](http://www.nrc.gov/reading-rm/doc-collections/factsheets) decommissioning  
.html)

One comment stated, “Official estimates for decommissioning only six reactors out of more than 100 US reactors in operation at that time exceeded the \$1.4 billion (set aside) and was estimated to cost \$2.6 billion dollars. (Nuclear Monitor, Feb. 1, 1993)

Another statement said: “The partial melt-down at Three Mile

Island taught investment bankers how a two billion dollar investment can turn into a billion dollar clean-up in under two hours.”

([www.orionmagazine.org/index.php/articles/article/316](http://www.orionmagazine.org/index.php/articles/article/316))

([www.planetark.com/dailynewsstory.cfm/newsid/38983/story.htm](http://www.planetark.com/dailynewsstory.cfm/newsid/38983/story.htm))

Hanford Nuclear Waste Reservation, 586 square miles along the Columbia River, contaminated by nuclear waste during weapons testing, is to be cleaned up by 2035 at a cost of \$12 billion dollars.

The cost to clean up toxic munitions contamination and unexploded ordnance around the country (USA) may reach \$200 billion.

(3,912 contaminated sites and 441 DOD installations)

(Source: The National Resources Defense Council, Apr.21,2004)

### **Canada**

Beginning in 1971 Canada constructed 22 nuclear reactors—  
Pickering (6), Bruce (8), Darlington (4), Douglas Point (1), Gentilly (2), Point Lepreau (1).

The Douglas Point Reactor at Kincardine , Ontario was shut down in 1986.  
Gentilly 1 reactor at Beaucour, Quebec was shut down in 1977.

(Source: Choosing a Way Forward, NWMO, App. 7, p. 275)

Bruce 1&2 started commercial operation in 1977, but later shut down for repairs till 2003, and were refurbished at a cost of \$275 billion Now units 3&4 are to be refurbished at a cost of \$1.5 billion, making for a total of \$4.5 billion dollars! Point Lepreau was refurbished in 2005 at a cost of \$1.4 billion dollars.!

- (Source: Nuclear Briefing Paper. #3, pp.7&8  
Canada's Uranium Production and Power. )

The Pickering reactors needed new pressure tubes in the 1980's at a cost of \$720 million dollars. (McCleans, Aug. 7, 1995, p. 24) Now Gentilly 2 in Quebec is up for review. The cost of mothballing it is

estimated at \$1.8 billion dollars. Or, the potential for refurbishing the plant is estimated at \$ 1.8 billion dollars!

(Source: lmoore@the gazette.canwest.com)

Douglas Point Reactor is in a shut-down mode, but has not yet been decommissioned. The expensive task of decommissioning the Canadian reactors is still to come in the future!

The Federal Government gave a grant of \$275 billion dollars to AECL for decommissioning and waste management for activities carried out at the Chalk River research plant prior to 1952

The Federal Government gave another grant of \$520 million dollars in June of 2006 to clean up wastes from research in medical isotopes, nuclear power, and refinery operations at Port Hope, Ontario.

### **Chernobyl in the Ukraine.**

More than 22 years ago, the worst nuclear accident in the world happened at Chernobyl on April 26, 1986. A combination of design error, which allowed an unexpected fire in the huge graphite core, plus some operator error, led to a large explosion that blew the top off of the reactor building, and spread deadly radiation around the countryside.

Radiation fallout contaminated over 140,000 square kilometres of agricultural land in Belarus, Ukraine, and Russia. Some 350,000 persons have been forced permanently to relocate. It is predicted that 270,000 cancer cases will result from the fallout, and of these 93,000 will die. The radiation cloud passed over many countries in Europe. (Source: [www.greenpeace.org/chernobyl/who\\_chernobyl\\_report\\_2006.pdf](http://www.greenpeace.org/chernobyl/who_chernobyl_report_2006.pdf) Also: [www.Spiegel.com](http://www.Spiegel.com) on Line, April 14, 2006)

“By 1991 the Chernobyl clean-up had already cost \$18 billion.”  
\_ (Source: Jim Harding, Canada’s Deadly Secret, p. 213)

There still remains radioactive fuel rods in the burned out hulk of the exploded reactor. A giant sarcophagus was built over the wreckage to lessen the spread of radiation. Now it is cracked and leaking. The wreckage is still too hot and radioactive for decommissioning.

In August of 2007, the French- led consortium entitled “Novarka” won the tender to build a new shelter for the shattered reactor at Chernobyl. The project is expected to cost about \$1 billion dollars.

(Source:  
[www.planetark.com:80/dailynewsstory.cfm/newsed/43531.htm](http://www.planetark.com:80/dailynewsstory.cfm/newsed/43531.htm))

The problem is that many of these decommissioning costs will be coming up in the future, 30 to 50 years after the building splurge of the nuclear reactors in the 1970’s and following. Some monies have been set aside by the companies for decommissioning, but with escalating costs, much of the financial burden may fall on the taxpayers.

Yet, some people still propose building new reactors, with the decommissioning costs to be borne by our grandchildren and great grandchildren. Some legacy to leave to our future generations!!