

Presentation to the Select Committee  
on Ontario Hydro Affairs

AN OVERVIEW OF THE REGULATION OF THE  
ACTIVITIES OF FLDORADO NUCLEAR LIMITED  
IN PORT HOPE, ONTARIO

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Fuel Cycle Branch  
Atomic Energy Control Board  
Ottawa, Canada

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Introduction

By the time this presentation is made the Committee will have heard a detailed description of Eldorado Nuclear Limited's operations in Port Hope. These include both chemical and metallurgical processes which are common to many other industries. In this case however, the material being processed is uranium in various forms and therein lies the reason for the Atomic Energy Control Board's involvement.

The plant processes natural uranium for both the domestic nuclear power fuel cycle and for export. Although the Committee has not spent a great deal of time discussing nuclear material safeguards it is interesting to note that the Port Hope refinery is the initial point in the Canadian nuclear power program where international inspection is imposed as part of Canada's obligations under the Treaty on the Non-Proliferation of Nuclear Weapons (N.P.T.). The AECB administers the obligations under this treaty that involve Canada's nuclear industry.

The Port Hope plant also processes enriched uranium for the fuel in Canada's research reactors and for a special kind of

fuel called booster fuel, used in some CANDU power reactors. The presence of enriched uranium means that the Port Hope plant is subject to the Nuclear Liability Act and therefore required to carry the special insurance called for in that Act. The AECB is responsible under this Act for the designation of nuclear installations and the prescription of basic insurance.

The plant both receives and produces wastes. It receives wastes from the fuel fabrication plants in Canada and recycles them to recover uranium. It produces chemical effluents and wastes and is therefore subject to environmental standards common to all industries that release these materials and radioactive effluents and wastes which are subject to the AECB's criteria for the management of radioactive waste.

#### Refinery Operations

Refining operations in Port Hope date back to 1932. When the Atomic Energy Control Board was established in 1946 it dealt mainly with matters of security and control over the movement of uranium and it was not until 1960 that health and safety aspects were included in the Atomic Energy Control Regulations. The AECB's first licensing action at the Port Hope plant, which involved considerations of health and safety was the licensing of the new UF<sub>6</sub> plant in 1970. Licensing of other activities was extended to the main refining operations in 1975, to Port Granby in 1975 and to the Welcome waste management area in 1978. The present situation is that all activities of Eldorado Nuclear Limited in Port Hope are licensed according to the system previously described to this committee.

The AECB monitors Eldorado's operations by periodic inspection and also in the case of the refinery operations by participation in monthly health and safety committee meetings. In the summer and fall of 1979 gaseous chemical emissions from the plant caused material discomfort for the citizens of Port Hope during certain weather conditions. This situation was symptomatic of an old plant operating at full capacity. In co-operation with Environment Canada and the Ontario Ministry of the Environment, the AECB directed Eldorado Nuclear Ltd. to restrict operations until the immediate problem was eliminated and to make modifications to the plant that would prevent recurrences of these situations. Judging by the performance in 1980 the problem now seems to be under control.

#### Waste Management

The AECB licenses two waste management areas maintained by Eldorado. One site called Welcome was closed in 1954 and is now managed in that access is restricted and surface and ground water is collected and treated for removal of arsenic and radium before release by pipeline to Lake Ontario. Refinery wastes have been buried at a second site called Port Granby, since 1955. These wastes included residues containing radium which are called raffinates, however the practice of burying raffinates at Port Granby was discontinued in 1979 at the request of the AECB. The Company now recycles these wastes to the Rio Algom and Agnew Lake Mines where uranium and sulphuric acid are recovered. The only wastes that are still permitted to be buried at Port Granby are

Calcium Fluoride, a relatively inert residue from the uranium hexafluoride circuit which contains small amounts of uranium and various types of industrial waste such as metal drums and non combustible garbage which may be contaminated with uranium.

Surface and ground water at the Port Granby site is collected in two catchment ponds and treated for removal of arsenic and radium before release into Lake Ontario. Both Environment Canada and the Ontario Ministry of the Environment sample the lake water to ensure that radium levels conform to environmental standards. With one exception, this monitoring shows that radium levels in the lake immediately off-shore from the site have consistently met provincial standards for drinking water quality. During the Spring when the ground is frozen and most dramatically this spring when considerable flood damage occurred in Port Hope, the water treatment system at Port Granby has been unable to cope with the surface water run-off. When this happens, radium levels at the sampling sites exceed the standards for a few days. This is an undesirable situation but not a serious one. The proper perspective is that a standard based on long term consumption of water containing radium has been exceeded for a very short period at a point where water is not taken for consumption. Nevertheless, the Company has been asked to examine practical measures that would improve the situation.

Considerable improvements have been made in the management of the Port Granby site by the treatment of water and the reduction of radioactive material entering the site. Nevertheless,

neither the location adjacent to Lake Ontario with steady erosion of the bluffs nor the method by which some of the wastes have been buried is acceptable for long term disposal. The Board has directed Eldorado to proceed with a comprehensive investigation and assessment of all measures necessary to remove and dispose of the radioactive wastes and contaminated fill with the objective of restoring the site for unrestricted use. Recognizing that this will take considerable time to plan and execute, the Board has further directed Eldorado to take certain immediate measures to stabilize the East Gorge in order to prevent land slides in that area.

#### Eldorado's Plans for New Facilities

Eldorado Nuclear Limited has announced that it intends to build new refining facilities at Blind River and Port Hope. The plant at Blind River will receive yellowcake from the mining companies and convert it to uranium trioxide. The Company previously submitted an environmental impact statement to the Federal Environmental Assessment and Review Process for a plant which would have extended the refining process beyond the uranium trioxide stage to produce uranium hexafluoride. In the AECB's opinion the environmental impact of the new proposal is not substantially different from the previous proposal and does not negate the previous recommendation of the review panel.

The proposed new plant for Port Hope will take uranium trioxide from the Blind River plant and convert it to uranium hexafluoride at a site adjacent to the existing plant at Port Hope.

In this case, the basic design of the conversion plant will be the same as the proposal presented to the Federal Environmental Review panel for a site in Hope township. To the best of our knowledge, Eldorado Nuclear Limited does not intend to submit its plans for the new site to the Federal Environmental Assessment and Review process. The Company has informed the AECB that it intends to conduct a comprehensive public information program in Port Hope including the holding of public meetings. Eldorado has not yet submitted a detailed proposal for site approval but anticipating that this will happen soon, the AECB has established an interdepartmental review committee including all federal and Ontario regulatory organizations that have a role in the assessment of Eldorado's plans. The technical assessment by these organizations will be just as rigorous as it would be for a public hearing.

#### Remedial Action Program

As you are well aware, there has been a remedial action program in Port Hope to clean up contamination from the early days of operation when radium was the product of the refining operation. Waste was buried in various locations around the town sometimes indiscriminately, and contaminated construction materials were diverted from the plant for private use. Where these materials were near the foundation of a building or actually part of the building, radon gas could accumulate in unventilated spaces creating a hazard.

Remedial work on approximately five hundred buildings and properties will be completed early in 1981 at a total cost of

approximately seven million dollars. Most of the contaminated material was removed and sent to the waste management areas of the Chalk River Nuclear Laboratory. That site is now full and a small amount of material has been stockpiled in Port Hope temporarily until a permanent site can be found.

An unresolved problem is the presence of approximately 200,000 tons of waste and contaminated soil in open areas. Because it is in open areas, radon cannot concentrate as it does inside buildings. However, there are always the possibilities that radium will move away from these sites in groundwater, that the material will be exposed by natural events and that there will be increasing pressure to remove restrictions on the use of these open areas. During the spring flood this year, some material was exposed by surface erosion of the flood water. However, surveys of the flooded areas showed no indication of significant transport of contaminated material away from the original sites.

James F. MacLaren Ltd., the manager of the remedial program in Port Hope has been contracted to investigate suitable methods and sites for disposal of this material.