

by

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In 1932, Eldorado Gold Mines (now Eldorado Nuclear) commenced an operation in Port Hope, Ontario to process ores mined in the Northwest Territories for the recovery of radium. Large quantities of wastes from this operation were used for construction fill or were dumped. Houses and buildings were built on this radioactive fill, and later it was discovered that improper waste disposal, transportation, and security procedures were involved as well.

One of the disposal sites was the Welcome Residue Area, about 3 miles northwest of Port Hope. Water contamination by surface run-off to Lake Ontario and adjacent water courses subsequently occurred. Investigations of the whole Port Hope problem took place over the years, notably in 1966 and 1975, but no major remedial actions were taken. Media coverage in 1975 had some impact, and finally the Atomic Energy Control Board (AECB) reviewed waste disposal operations. The essential information in their report "seems a shocking testimony to neglect and malpractice". It included improper fencing and absence of fencing at the high-radiation dump site at Welcome. Even remedial action taken by the AECB left levels at the outer boundary of Welcome up to 300 times maximum permissible levels. Proper warning signs were absent, unclearly marked, or improperly located. Water samples from the various waste areas at Welcome gave radiation readings of 3.5 times the AECB maximum permissible limit for drinking water.

Steve X. is 30 years old, an electronic technologist. During 1958-59 he lived with his family about 1 1/4 miles south of the Welcome dump. The local creek carried water run-off from the dump to Lake Ontario. The family's vegetable patch was within 70 feet of the creek. They had a well at the back of the house. Steve used to play in the creek and along its banks, and on the mounds of waste in the dump itself. Steve had his thyroid removed in 1978, at which time a cancerous tumour was found. Steve's mother died of breast cancer three years ago.

The case outlined above is fact, not fiction, and it serves as an example which raises many of the issues regarding radioactive materials which should concern law students as citizens, and which may concern them as practitioners. The issues are complicated, and we will examine them in terms of problems of substance (actual scientific knowledge), problems of structure (legislation and administrative procedures), and of policy (resolving conflicts of various interests).

PROBLEMS OF SUBSTANCE

Problems of substance are generally outside the realm of the average lawyer. They include questions of the adequacy of scientific data, the setting of meaningful

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standards, and the perceived need for nuclear power.

Scientists have been arguing for years about the adequacy of tests performed to ascertain the effects of radiation. They question whether the information available is accurate enough or complete enough to allow anyone to assess the real impact of exposure to radiation. Briefly, radiation comes from the following sources: nuclear power plants and their wastes in transport or in storage or in dump sites; X-rays, television, microwave ovens, atmospheric fall-out from weapons tests; hospital and academic research programs and their wastes in transport or in storage or in dump sites; and natural sources such as cosmic rays and deposits of uranium. Radiation results from the process of an unstable atom changing to a stable atom, releasing high-energy alpha particles, beta particles, and/or gamma rays to achieve this transformation (alpha particles consist of 2 protons and 2 neutron. Beta particles are electrons. Gamma rays are photons).

The amount of energy emitted by the radiation is measured in rads. However, 1 rad of gamma rays does not necessarily produce the same biological damage as 1 rad of alpha rays. Thus, for the purpose of setting radiation safety standards, it is necessary to have a unit (the rem) that measures the product of the radiation dose in rads and its damage-producing nature. Obviously, the most penetrating form of radiation, gamma rays, is most hazardous externally. Alpha or beta radiation can do little harm externally, but is highly dangerous if inhaled or ingested.

The second problem of substance derives directly from the first, and involves setting meaningful health standards in the absence of complete information. Again, the arguments have been lengthy and, over the years, the legally permissible and recommended levels have been gradually reduced. From a legal perspective, the current regulations set by the Atomic Energy Control Board (AECB) under the Atomic Energy Control Act² are the most relevant. There are different standards for the general population than for people who work in the nuclear industry. The dose rate for the general population from sources other than natural and medical is 500 millirems per year, and the legal dose rate for radiation workers is 5,000 millirems per year.

However, a 1976 report prepared by Dr. James Ham, Commissioner of a provincial enquiry into the health and safety of workers in Ontario mines³ took the view that there is no safe level of radiation, but that safety is related to the risk which is seen as acceptable in the circumstances.

The third question of substance is whether we need radioactive material to produce energy. Are practical alternatives available? This too is a subject of great debate and clearly has policy implications as well. It is probably outside the scope of any legal problem which law students will face, although it is of interest to many citizens. The problem involves matching the four main uses of energy (high-temperature "process" heat, low-temperature "space" heat, electricity, and internal combustion engines) in the four sectors of society (industrial, residential, commercial and transportation) with the sources of available supply (oil, natural gas, coal, hydro, nuclear, solar, other renewables).

Of these three questions of substance, it is usually the first which presents problems for the lawyer. Using Steve's case as an example, there is no definitive scientific data to prove that his exposure to radiation as a child resulted in cancer of the thyroid as an adult. There are only probabilities and estimations. Proof of causation has been one of the main stumbling blocks in all of these radiation cases because, unless death occurs immediately, the effects are delayed, long-term and variable.

PROBLEMS OF STRUCTURE

The main legal concerns in radiation cases arise from problems of structure. The regulatory structure in existence under present legislation does not protect the average citizen against loss of life, health, or property from radiation because of several defects, including secrecy provisions regarding nuclear information; the extent of administrative discretion, the absence of public participation, and statutory limitations on liability. In addition to these legislative problems, over the years a further problem has developed: the tendency for the regulatory agency to accommodate the interests of the industry.

A. An Overview of the Legislation

Before discussing the problems, an outline of the legislation is necessary. The federal government has primary jurisdiction over nuclear developments. The Atomic Energy Control Act governs the Atomic Energy Control Board (AECB), which was created in 1946, and Atomic Energy Control Limited (AECL), created in 1952. The AECB is a regulatory and money-granting agency, and AECL handles research, development, marketing, and promotion of atomic energy. Because of this structure, the Minister of Energy, Mines and Resources plays a double role of regulator and

proponent of an expanding nuclear program. A legitimate question is whether the public interest is protected when these two functions rest in the same decision-maker.

This problem was to be remedied in a new statute, the Nuclear Control and Administration Act,⁴ introduced in 1977. This Act was intended to separate the present responsibilities for health, safety and security matters from the commercial and promotional role. Also, this Act was intended to rectify the lack of public information and guarantee public hearings when the AECB licenses nuclear facilities. The bill died on the order paper when the May, 1979 election was called, and thus, the public is left with the 30-year old Atomic Energy Control Act.

The other major mechanism at the federal level relevant to atomic energy in Canada is the Environmental Assessment and Review Process (EARP), an informal administrative program intended to apply to environmentally sensitive projects proposed by federal departments and agencies. (See discussion below.)

Although the federal government has formal jurisdiction over all aspects of nuclear energy, it encourages cooperative action with the provinces. In Ontario this raises important jurisdictional questions because provincial environmental controls are more comprehensive than federal controls. For example, Ontario Hydro, a provincial utility and a major producer of nuclear power, is potentially subject to the Environmental Assessment Act⁵ of Ontario. This act would require studies, at an early stage, of the entire complex of environmental effects a project might generate. However, under the Act, a provincial undertaking may be exempted by regulation, and this is exactly what was done with the Darlington Nuclear Generating Station in mid-1977.

Other relevant provincial legislation includes the Public Health Act,⁶ which is particularly important in the case of Steve X., where the Welcome dump site may continue to cause problems. In short, the Ministry of Health has a duty under the Act to determine whether the condition of any public or private place, or the disposal of any type of waste, is a nuisance or injurious to health. It has the power to order whatever changes are necessary to remove the nuisance or health hazard.

B. SPECIFIC PROBLEMS

i) Secrecy

Under the Atomic Energy Control Act, all information is secret unless the Minister or the Board decides to make it public. The public has no right to information on nuclear power, and any information available is first approved by the Minister and the Board.⁷ Regulations even make it illegal for anyone to release any information about the marketing of uranium. The Progressive Conservative party challenged the validity of these regulations in court in 1977 with limited success. The court ruled that Members of Parliament could talk about uranium mining in the House of Commons, but they could not report the information to their constituents.⁸

ii) Administrative Discretion

An example of the pervasiveness of administrative discretion is the federal Environmental Assessment and Review Process, which has been used to assess the potential impact of nuclear installations. EARP is an entirely discretionary process. The choice of whether to do an assessment is completely up to the agency proposing to undertake the activity which may cause the problem. Furthermore, the proponent may decide to ignore the assessment if one is done.

There are numerous examples of administrative discretion in the Atomic Energy Control Act. For instance, under section 9, the Board may license nuclear facilities, and may suspend or revoke those licenses, make regulations concerning research, mining and processing for prescribed substances (such as uranium), production and use of atomic energy, access to information, international contacts, and any other matters necessary to carry out the purposes of the Act. Under the AEC regulations prescribed substances must be disposed of in accordance with conditions set by the Board, or, if none have been made, in accordance with the written instructions of the Board (see section 25). This type of discretion results in serious uncertainty: in some cases, no action at all is taken by the

administrator, and there is no means for anyone to force action; and in other situations where action is taken, there is no assurance of consistency with previous action.

iii) Lack of Public Participation

Members of the public face difficulties when they attempt to participate in decision-making on nuclear issues. There is no requirement that public hearings be held before important questions are decided - for example, whether or not the AECB should approve a nuclear power plant site, or establish new safety standards. A mere discretion to hold hearings is of little help, as mentioned above. There should be strict requirements to hold public hearings on these major issues. The terms of reference should allow discussion of the social, economic, and environmental impact of nuclear power. The result would ideally be a more balanced approach to the issues than the current technology-dominated discussion. It must also be added that if public hearings are required, provisions for timely notice to interested parties and adequate funding for their experts should also be legislated.

The growth of an active anti-nuclear movement in Canada in the mid-1970's resulted in indications that some public participation would be included in the future. The proposed Nuclear Control and Administration Act had provided that the new Nuclear Control Board would 1) hold mandatory public hearings with regard to construction licenses for major nuclear facilities, such as mine-mill complexes, nuclear reactors, heavy water plants, and nuclear waste management facilities; 2) have discretionary power to hold public hearings on other matters within its jurisdiction, including such significant matters as the siting of a nuclear facility; 3) publish notices of receipt of all license applications and all subsequent licensing action; 4) make available for public inspection all documents submitted by applicants and licensees that are not specifically exempted. These proposals would have resulted in improvements on the current situation, but are still inadequate.

iv) Liability

The issue of liability for radiation damage from nuclear accidents is a contentious one. Because private insurance companies would not take sole responsibility, the federal government passed the Nuclear Liability Act⁹ in 1970, which was intended to ensure that injury to the person or damage to property would be compensated for. The Act was not proclaimed until 1976, largely because the private

insurance industry balked at the broad no-fault liability provided for in the Act. The Act may seem, on paper, to broaden the compensation that would otherwise be given under the law, but in practice the language may be sufficiently ambiguous as to deny compensation to a large number of deserving cases. For example, section 6 refers to "injury or damage that, though not attributable to a breach of the duty imposed upon an operator by this Act, is not reasonably separable" from damage attributable to a breach. This appears to cover ill effects that might appear years after an incident. However, the claimant must show specific injury or damage that is attributable to a particular breach of duty in order to be eligible, and the constituents of this may be difficult to establish. Further, does the word "attributable" mean that there must be proof of causation or simple proof of contribution towards resulting harm? It is also unclear exactly what injuries the Act covers - the definition of injury as "personal injury" in s. 2 may be broad enough to cover such things as nervous shock, economic injury, and consequential damage to one's family, but the Act does not specifically say so.

By allowing a claim for damages within three years of the victim's becoming aware of the injury, the Act recognizes that the effects of radiation exposure are not always immediately obvious. However, this provision appears to be curtailed by the overall time limitation of 10 years from the date the cause of action arose. This may create insurmountable barriers to compensation for victims like Steve, whose cancer caused by radiation contamination may take 20 years or more to become apparent. The sad fact is that this type of situation is likely to be the most common, in the absence of a major "disaster".

v) Regulatory Effectiveness

The tendency for regulatory agencies such as AECS to accommodate the interests of the nuclear industry to the detriment of other interests has been apparent for many years but has only relatively recently become a major public concern. The situation arises from the fact that nuclear experts in Canada are a small group, and they move freely between the industry itself and the agencies which regulate it. Thus, questions of conflict of interest and general bias in favour of the industry have arisen. One possible solution is to require that Cabinet appointments to regulatory bodies such as the AECS include a certain number of representatives from public interest groups, atomic workers, labour unions, etc. to balance the influence of the small group of "insiders". It is crucial to have effective regulatory agencies - that is agencies which impartially enforce orders and standards so as to protect all interested parties, not merely one group.

PROBLEMS OF POLICY:

The major policy dilemma regarding radiation involves balancing the unquantifiable health risks against a perceived need for nuclear-produced electricity. Other sources of radiation are small compared to the amounts involved in nuclear energy. Three policy issues present themselves. First, who is going to make the decisions? Secondly, is a "cautious" or a "pro-development" attitude to be taken? Thirdly, what are the other implications of the further development of nuclear power?

The first question raises the matter of the appropriate role of the technological elite, and its arguments that its information is too technical to be of any use to politicians or ordinary citizens. Is it appropriate, or even safe, to allow experts to make the decisions on technical grounds, or should politicians make them publicly, on social grounds? In the authors' view, the technical expertise approach should be rejected in favour of public discussion and socially responsible decision-making.

If we assume that the politicians and the public should be the decision-makers, the question arises: what approach should be taken? The cautious approach may be summed up in the phrase "it's better to be safe than sorry", and advocates strict supervision, low permissible doses, and restricted expansion of nuclear energy until more knowledge of actual risk is obtained. The pro-development approach recognizes that all new developments carry risks and accepts these risks as long as they are seen to be "reasonable".

Of the two types of people described, the pro-development group will seldom appear in a lawyer's office. They have given their consent to the health risks. It is the cautious group who will be demanding remedies for the risks imposed upon their health by someone who did not obtain their prior consent.

The common law's traditional approach to an individual's life and health recognizes the importance of the issue of consent (there are countless cases about consent to operate, to treatment, to risks while participating in violent sports) and it is an interesting social, if not legal question whether by choosing to live in North America a person is to be deemed to have consented to threats to life and health from nuclear power. Implicit in making such individual choices is the assumption that the individual is informed as to the true nature of the options available.

Discussion of policy problems relating to radiation and nuclear power would not be complete without at least a passing reference to implications other than those to health. Although lengthy discussion is not possible within the scope of this article, other issues include, for example, increasing centralization of power sources, with associated difficulties when a breakdown occurs, and the need to strengthen security forces in order to cope with the production of large amounts of potential weapons material.

CONCLUSION :

All of the problems discussed above have arisen in the case of Steve X., outlined at the beginning of this article. Scientific data is inadequate to prove that his cancer was caused by exposure to radiation. Meaningful standards to protect people like Steve can only be estimated. Society's perceived need to expose people to health risks from radiation for the purpose of maintaining its standard of living is currently meeting with serious criticism. Secrecy provisions originally contributed to public ignorance of the dangers of living near the Welcome Dump, and now present difficulties in gathering evidence to establish Steve's legal claim. Wide administrative discretion delayed for years a proper assessment of conditions in his neighborhood. The lack of public participation limited effective criticism in the past and inhibits accountability to this day. The liability provisions appear inadequate given the nature of his health problem. The regulatory structure has been a demonstrable failure in the Welcome Dump example, where health standards were exceeded and precautions were ignored for years. The technological elite's belief that the public is incapable of deciding nuclear issues is refuted by average citizens like Steve who very clearly understand that the crucial questions are not those dealing with the relative merits of certain types of equipment, but are, instead, those dealing with choices of lifestyle, social direc-

tion, and human values. It is abundantly clear that the cautious approach of "it is better to be safe than sorry" was not the attitude prevalent in the Port Hope area.

Steve X.'s legal problem, like all legal problems, is, finally, a question of the proper remedy. The remedy would include compensation for the medical costs resulting from his illness and for loss of physical capacity. Furthermore, his estate may eventually want compensation for premature loss of life. People who now live near the Dump may want "avoidance" compensation, that is, the replacement value of their homes if they are unable to sell them, so that they can afford to move away from the health hazard. Others may want to force clean-up of the dump. Citizens in other locations may try to prevent facilities with similar potential health hazards from being established in their areas. The law as it exists now is of little assistance to any of these people. It is to be hoped that future legislation will reflect a more open approach and provide effective remedies in this area of public concern. *

FOOTNOTES

1. Fred H. Knelman, Nuclear Energy - The Unforgiving Technology, Edmonton: Hurtig Publishers, 1976, p. 133.

Most of the background information in these first two paragraphs is taken from Chapter 5 of Knelman's book.

2. The Atomic Energy Control Act RSC 1970 ch.A-19
3. James M. Ham, Commissioner, Report of the Royal Commission on the Health and Safety of Workers in Mines, Ministry of the Attorney General, Toronto, 1976, p.90
4. Nuclear Control and Administration Act, Bill C-14, First Reading November 24, 1977.
5. Environmental Assessment Act, SO 1975, ch. 69.
6. Public Health Act, RSO 1970, ch. 377
7. The Board may make regulations "for the purpose of keeping secret information respecting the production, use, and application of, and research and investigations with respect to, atomic energy, as in the opinion of the Board, the public interest may require". Atomic Energy Control Act, s.9(e).
8. Re Clark et al. and Attorney-General of Canada (1978), 17 O.R. (2d) 593
9. Nuclear Liability Act RSO 1970 (1st Supp.), ch.29.

* This article draws heavily on Environment on Trial, Revised Edition, Toronto, Canadian Environmental Law Research Foundation, 1978, Ch.13.