

and immobilization of spent fuel wastes, the definitive disposal of immobilized material remains the most challenging and disturbing aspect of the nuclear waste management program. Most of the testimony heard by the Committee concentrated on this aspect.

## The Technical Aspect

During the testimony of representatives of Atomic Energy of Canada Ltd., W.T. Hancox, Vice-President in charge of Waste Management Research and Development, listed some of the characteristics of nuclear fuel wastes:

- Ten years after being discharged from the reactor, a used CANDU fuel bundle generates about the same amount of heat as a standard household lightbulb.
- Most of the highly radioactive constituents of spent nuclear fuel decay relatively rapidly, so that the hazard from penetrating radiation is negligible after 500 years.
- Some of the long-lived radioactive materials, such as iodine, cesium, technetium and plutonium, remain toxic for hundreds of thousands of years. Their potential hazard is similar to that of many non-radioactive toxic wastes.
- The long-lived radioactive materials can do harm only if they are ingested or inhaled. The purpose of the disposal system is to isolate them from the environment.
- One hundred years after a vault has been closed, the overall toxicity of its contents would be comparable to that of high-grade uranium ore deposits found in nature.<sup>(58)</sup>

The performance of the disposal system is currently being assessed by AECL, on the basis of safety criteria, within the framework of the Concept Assessment Program. This is an integrated program of laboratory and field analysis, engineering design and mathematical modelling. AECL is thus involved in perfecting and validating the technology for selecting a site and constructing a disposal system.<sup>(59)</sup> Considering the importance given to the use of computerized mathematical models in verifying the safety of the concept, the Committee would like to review some of the elements in the testimony of Al Rycroft and Alayne McGregor of the organization called Initiative for the Peaceful Use of Technology (INPUT).

According to the INPUT spokespersons, a computer model is a logical representation, within a computer, of real events and processes. Such a representation can only be a simplified version of reality. It follows that the first difficulty that arises from the use of computer models for nuclear waste disposal is the impossibility of modelling programs that correspond to factual realities, because they typically deal in tens or hundreds of thousands of years. For Al Rycroft, "To accept their conclusions wholeheartedly is an act of faith". In addition to making predictions that are not necessarily accurate, computer models may contain a variety of serious errors. In a nuclear waste disposal model, for example, a typing mistake, a false assumption, a logical error or a conceptual inadequacy could falsify the scenario produced.<sup>(60)</sup>

<sup>(58)</sup> W.T. Hancox, Atomic Energy of Canada Ltd., Issue No. 6, February 2, 1987, p. 6-9.

<sup>(59)</sup> W.T. Hancox, "Progress Toward a Canadian Concept for Disposal of Nuclear Fuel Waste", document produced for the Standing Committee on Environment and Forestry, Ottawa, February 2, 1987, p. 4.

<sup>(60)</sup> Al Rycroft and Alayne McGregor, Initiative for the Peaceful Use of Technology, Issue No. 10, March 17, 1987, p. 7-15.