

Atomic Energy Commission de contrôle
Control Board de l'énergie atomique
Ottawa, Canada
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Directorate of Analysis and Assessment

Your file Votre référence

Our file Notre référence

September 16, 1994

40-7-0

Mr. Peter Victor
Assistant Deputy Minister
Environmental Sciences & Services
Ministry of Environment and Energy
2 St. Clair Avenue West, 12th Floor
Toronto, Ontario
M4V 1P5

Re: Ontario Drinking Water Objective for Tritium and Other Radionuclides

Dear Mr. Victor:

Thank you for the opportunity for meeting with Dr. Measures and me to discuss the implications, from a regulatory point of view, of the ACES report entitled "A Standard for Tritium; a Recommendation to the Minister of Environment and Energy".

AECB staff have reviewed the document and our comments on the specific recommendations are attached.

Our overall conclusion is that the ACES recommendation to lower drinking water guidelines from the 7000 Bq/L recommended by OMEE, Health Canada and the World Health Organization, to 100 Bq/L and then to 20 Bq/L is not only unwarranted on a scientific basis, but has the potential to impose unnecessary costs on Ontario taxpayers for very little, if any, net benefit.

We agree that tritium levels should be kept at as low a level as possible. However, we do not agree that locking into an extremely low limit on the grounds that it can be met today allows for making the best use of public funds in the future. As discussed during the meeting, we believe firmly in setting limits above which conditions are considered to be unacceptable and immediate action is required, but below which there remains some flexibility. An annual risk of 10^{-6} is approaching a level which we consider to be below regulatory concern, ie a level where further expenditures would be hard to justify. Our limits - that is the level which the licensee must meet regardless of cost, or face legal or economic sanctions - are set to be consistent with other health and safety risks faced by the

general public (ie about 5×10^{-5} per annum). The ALARA (as low as reasonably achievable, social and economic factors taken into account) requirement enforces the use of criteria that ensure that levels are maintained much below the limit. This approach allows for a review of the situation should circumstances change, without the need for immediate and perhaps drastic, unwarranted, and expensive action.

We believe that the cost of regulation must be considered when setting all standards. We further believe that using a lifetime risk of 10^{-6} as the basis of the standard for tritium in drinking water is essentially a "zero risk" policy. We question the wisdom of assuming that zero risk can be achieved in any human endeavour. Further, to set a limit at this level (i.e. where economic or legal sanctions could be taken if the limit is exceeded) could, in our view, seriously skew public expenditures, setting a very undesirable precedent with no net benefit. As regulatory authorities, we must ensure that expenditures to protect the public are not considerably higher for one source of risk than for any other. It should also be noted that at Pickering in 1993, the tritium in drinking water pathway represented only 0.7% of the total dose to members of the public. Thus to concentrate solely on the drinking water pathway and to put all our efforts on this small portion of the exposure route would not be the best use of public resources.

I wish to emphasize that risk estimates for radiation are based on the compilation of a large amount of data collected over many years on human exposures to high radiation doses, mostly at high dose rates. The assumption that radiation can cause an effect at low doses, is just that, an assumption which we use to ensure a conservative approach to regulation. In its BEIR V report (Health Effects of Exposure to Low Levels of Ionizing Radiation), the US National Research Council notes that we cannot rule out the possibility that there are no effects at doses comparable to background radiation levels. We at the AECCB consider that the source (human) and the large number of data on which the risk estimates from radiation are based are sufficiently different from data used to estimate risks from exposures to chemicals to warrant a different approach to regulation. We agree that it may be necessary to impose a high level of conservatism when dealing with chemicals believed to be toxic, but for which there are few or no human data, but we emphasize that this is an inappropriate level of conservatism for radiation where risks to humans are, we believe, better understood.

We understand that you have received many letters commenting in support of the proposed change. It has been our experience that pressure groups are extremely well organized, and have been known to conduct write-in campaigns with the end result that the sheer number of letters from individuals within these organizations overwhelm the responses from other groups and individuals. We question whether the view of these groups, whose set agenda is not aimed at a good comprehensive policy on health and safety, really represents the views of the majority of the general public. We, as regulators, must ensure that any standards that we set do not result in unwarranted sanctions against any activity within the province.

Finally it should be emphasized that it is our desire to cooperate fully with the OMEE, as we have done for the past 30 years. However we are concerned that should a recommendation that is unnecessarily restrictive be adopted, we would be unable to in clear conscience adopt it as part of our regulatory process.

Yours sincerely,

A handwritten signature in dark ink, appearing to read 'J.G. Waddington', with a stylized flourish at the end.

J.G. Waddington
Director General

Attachment

APPENDIX

The following are the AECB specific comments on each of the recommendations proposed by the ACES. The numbers correspond to the sequence of the recommendations in the ACES report.

Recommendations

1. The AECB already uses a pathways approach to calculate doses to the general public from all radionuclides released from NGS'. This approach is a multimedia and multiradionuclide approach. Therefore the AECB approach goes beyond that recommended by ACES.
2. The AECB currently uses the methodologies for risk estimation developed by ICRP, NEA, UNSCEAR, and BEIR. The methods established by these agencies have been developed after due consideration of all available data (mostly human) and are internationally recognized as acceptable for use in regulation of the nuclear industry. Risk estimates are under continual review at both the national and international levels.
3. Before including radionuclides on the priority pollutant list, the concepts of persistence, toxicity, and bioaccumulation should be defined. However it must be noted that tritium does not bioaccumulate, rather the organisms in contact with this radionuclide equilibrate with the ambient concentration in the environment.
4. We agree that a cost analysis of different methods to achieve the recommended drinking water objective must be undertaken, as part of the considerations before implementation. However we believe strongly that there must be some reasonable cut-off point below which further reductions in risk are not reasonable. The errors associated with such calculations must be recognized. Risk estimates must not be considered as absolute numbers.
5. Although the AECB always welcomes initiatives to improve emission control technologies, the AECB does not espouse the philosophy of best available technology regardless of cost as a means of regulation. We consider our present approach to the regulation of radionuclide releases and current emission control technology adequate to meet our dose limits and operating targets, and we would not impose additional, unnecessary conditions on the licensee.
6. Licensees are required to monitor the effluents before release from their facilities, and to report the results to the AECB. The results are tabulated and submitted to the AECB every quarter. These are available to the public at the AECB offices. Each licensee has established administrative target levels which are well below the limits (typically 1% of the Derived Emission Limit). Exceedances of these targets are reported immediately to the AECB. The licensee monitors levels at the water treatment plants, as does Health Canada and OMEE/OML.

7. The AECB has no concern over the need to detect a pulse of tritium at these low levels because a pulse will not result in any change to the statistical risk, even to the fetus. We consider it a waste of regulatory resources to attempt to measure such short term pulses at the source of drinking water.

Effluent samples are taken and analyzed by the nuclear power plants before the effluent is released. During release the effluent is subject to on line monitoring.

8. The AECB encourages all licensees who release tritium to the environment to explore the feasibility of measures to reduce tritium emissions. However such studies should include the cost of implementing these measures, since cost-benefit considerations must be included at these very low doses.
9. Agree
10. The AECB carries out a research program on many aspects of radiation, including some studies on the effects of low level radiation. The program is reviewed on an annual basis by the five member Board and its advisers, to ensure that the research undertaken is appropriate.
11. The AECB Regulatory Support Research Program is published annually. Comments on the program are always welcome.