Speech by

# Mr T. SULLIVAN

## MEMBER FOR CHERMSIDE

Hansard 27 April 1999

### RADIATION SAFETY BILL

**Mr SULLIVAN** (Chermside—ALP) (5.03 p.m.): I rise to support the Radiation Safety Bill 1999. At the outset I also would like to congratulate the Minister for bringing to fruition a Bill which has been more than a decade in coming to this Chamber. It must be pleasing to the Minister that she can celebrate her birthday by guiding this Bill through the House. I would also like to thank the Radiological Advisory Council of Queensland under the acting chair, Dr Jean Collie, for its constructive contribution and cooperative effort in making suggestions for changes to the legislation.

It was pleasing to see the profession, the legislation branch of Queensland Health and the politicians working together so that the best outcome could be achieved for the people of Queensland. I should have put a small caveat on that—most of the members of the House work cooperatively. It is sad to see the shadow Minister for Health not able to say a positive word about a process which has taken more than a decade to come to this place because of its complexity. All she can do is whinge about various aspects of it, but I guess she is following her lead in that regard.

It was pleasing to see that the Government has accepted almost all of the recommended changes put forward by that advisory committee. This is an example of a Minister who is prepared to trust the members of the profession, to work with them, to listen to them and to accept their advice while having to take into account other factors that may be outside the health area strictly speaking.

Many Queenslanders would be surprised to know of the wide use of radiation in Queensland in both its ionising radiation and non-ionising radiation forms. The use has become extremely common in a range of industries. We are aware of certain medical uses, such as the plain film diagnostic radiography, or simply the X-ray of a broken arm; fluoroscopy, which is used to examine tissues and other structures of the body during procedures such as cardiac surgery; mammography, which is used for the screening and diagnosis of breast cancer; and computed tomography, or CT, scanning, which involves the generation of an image by computer synthesis of X-ray transmitted data. CT scans are used for diagnostic purposes, such as in the detection and location of brain tumours, particularly where precise information is required regarding the density, size and location of a feature such as a tumour. It is used in diagnostic nuclear medicine. That is where radioactive substances are used to assist in the diagnosis of a medical condition, such as bone scans to detect tumours. We see it with radiation therapy where radiation is used to treat medical conditions such as cancer, and in bone mineral density measurements, for example, to detect osteoporosis.

There are a number of non-medical uses as well, and these include determining the density of materials flowing through pipes or the density of geological deposits; examining the levels of material in containers, such as drink cans or silos of coal; determining the thickness of material, such as paper or copper, on printed circuit boards; assessing the percentage of certain chemicals and materials, such as coal; assessing the moisture content of materials, such as soil and concrete; removing static following bottle drying during recycling of bottles in analytical balance; tracing the direction of flow and resistance times of material in industrial processes; and researching the biological impact of pollutants on flora and fauna in the Great Barrier Reef. These uses affect people in their lives—in the industry, in our daily life and in research.

More and more applications are being developed as radiation detection equipment becomes increasingly sophisticated and as a great variety of radiation sources becomes available. The Radiation

Safety Bill will cater for all foreseeable applications of radiation. The Bill, through providing a sound, regulatory framework, is flexible enough to cater for emerging use of radiation in Queensland, for example, the manufacture of short-lived radioisotopes in a cyclotron—such equipment is currently installed in a number of large hospitals in New South Wales and Victoria—or the use of body scanners to search for weapons. As we know, body scanners are increasingly being used overseas to enhance security at airports, prisons and nightclubs.

However, many residents and constituents have legitimate concerns about certain aspects of radioactive substances, such as who can expose people to radiation. One significant change in the Bill concerns the irradiation of persons for diagnostic or therapeutic purposes. Under the current legislative regime, unlicensed persons are able to intentionally irradiate a human being, provided they are under the direction of an appropriately authorised use licensee. However, under the Radiation Safety Bill, any person who intentionally irradiates a human being as part of a diagnostic or therapeutic process must hold a use licence to carry out such a procedure. This has to provide better safeguards for our constituents.

With the assistance of the relevant professional associations, Queensland Health has been encouraging persons likely to be affected by these new arrangements to obtain licences, and there has been an overwhelmingly positive response to this. As a consequence, the impact following the proclamation of the new Act will be minimal. I hope the Opposition spokesperson is aware of that, because she was proclaiming a bit of gloom and doom early in her speech saying, "What are you going to do? What resources are you going to provide for this?" Maybe she is unaware that the professional people working in this area act as true professionals, want to improve themselves and want to act in the best interests of their patients. Despite this, there will be a period of approximately six months after the commencement date for persons who do not hold a licence to obtain a use licence.

Furthermore, the Bill sets out a number of specific requirements in relation to the irradiation of persons, such as that only certain categories of persons—that is, authorised persons—will be permitted to request that a diagnostic procedure be carried out or prescribe a therapeutic procedure. This will assist all concerned—the patient, the patient's family and those persons performing the procedure—in ensuring that the person requesting or prescribing the delivery of a radiation dose to persons does have sufficient expertise to assess the risks, as compared with the benefits, of delivering the dose of radiation to the patient.

The Bill recognises that in certain circumstances, in order for a procedure to be successfully carried out, a person other than the person undergoing the procedure may be exposed to radiation. A typical example would be where a parent comforts and holds a small child in their arms while in a desired position for a diagnostic procedure such as an X-ray. In these circumstances the Bill will limit the radiation dose such persons may receive.

Another legitimate concern that many constituents have deals with the disposal of radioactive material. I congratulate the Minister and all those involved in bringing this Bill to the House for including good protective disposal procedures. Although society is slowly becoming more tolerant of the beneficial use of radiation, we are increasingly becoming aware of the hazards associated with the use of radiation, and particularly with the inappropriate disposal of radioactive waste.

The Bill specifies that a person must not dispose of radioactive material unless the concentration or activity of a radionuclide in the material is not more than the maximum concentration or activity prescribed under a regulation. The term "radioactive material" includes all radioactive substances for which a person must obtain a possession licence, as well as other materials which do not contain sufficient concentrations of radioisotopes to warrant licensing but which contain sufficient radioactivity to warrant control in relation to their release into the environment. An example of material which would not require a licence but which must have controlled disposal is abrasive blasting media, some of which contain moderately high levels of radioactivity.

Given society's concerns regarding the disposal of radioactive materials, extensive studies have been undertaken at an international level to determine the fate of each radioisotope in the natural environment and the pathways by which exposure to radiation can occur, and the risks these low levels of radioactivity pose to human beings and to the environment. There is an assumption made by bodies responsible for developing the disposal of release criteria, such as the International Commission on Radiological Protection, that human beings are the most radiosensitive of all creatures. If the risk to the health of people is controlled, then the risk to the health of all other creatures is also controlled. This assumption has been borne out by laboratory and other tests over extended periods. As a result of these studies, recommendations have been made as to the concentration or level of radioactivity of materials which may be safely released into the environment. These concentrations are low enough to ensure that the disposal of radioactive material will not pose an unacceptable risk to human beings, flora, fauna or the environment.

The concentration or activity of radioactive materials which may be released into the environment will be detailed in the regulation to be made under the Radiation Safety Bill. Typically, in

addition to the very low concentrations of radioactive material being disposed of, the volumes of the material are very low. For example, it may be acceptable to release one litre of a solution containing a small concentration of calcium45 into the ocean, but it may not be acceptable to release 1,000 litres in one release.

Upon their release into the environment, the concentration or activity of the radioactive material will promptly be reduced even further through dispersion processes. Dispersion processes include disposal into the sewerage system or into the atmosphere and dispersal in man-made engineered facilities such as tailings dams or landfill sites. Nature assists in the dispersion process through air and water currents and chemical solution and deposition processes. Those persons who use radiation for a specific purpose can assist with the environmental concerns by choosing short half-life radioisotopes so that, irrespective of the eventual method of disposal, the radioisotopes naturally decompose within a short period.

Provision is made to define the point in the disposal process at which the concentration or activity of radioisotopes will be calculated. A disposal point could be at the output of a stack, at the entry of a sewerage pipe into the sewerage system, at the exit of an open drain or at the place that solid waste is deposited. Radioactivity is relatively easy to measure with special equipment and, consequently, it should be easy to assess whether disposal concentrations are meeting the prescribed maximum levels. It is therefore important that the very low concentrations are able to be determined at a specific point in the disposal process to ensure that compliance with the legislation is able to be rigorously enforced.

The Bill also provides for the chief executive officer to approve the disposal of above-the-limit concentrations of radioactive material. An approval to dispose of radioactive material must be obtained prior to the material being disposed of and is not renewable. Such approvals are intended to cover those few occasions on which disposal of above-the-limit concentrations of radioactive materials is required as part of processes such as the remediation process for an emergency situation or a study that is being undertaken for environmental, civil or chemical engineering purposes.

An emergency situation which may necessitate the release of above-the-limit concentrations of radioactive material could be an accident in a laboratory, resulting in the continuous release of radioactive material into the atmosphere within the laboratory. It may be necessary, in order to stop the reaction, for the laboratory to be opened to clear the atmosphere to permit a person to enter to stop the continuing reaction. This opening of the laboratory constitutes a release into the environment which must be approved before it can occur. This has happened only once or twice during the past 10 years.

Environmental, civil or chemical engineering studies are undertaken to detect where insects such as ants are nested, an environmental study; to detect the location of pipes in the sewerage system, a civil engineering study; or to detect the flow rate and patterns of material through an industrial process, a chemical engineering study. These intentional above-the-limit disposals into the environment for these types of studies typically use very short half-life radioisotopes, of the order of a few hours to a few days, bound to chemically inert substrates, thereby causing negligible environmental harm. Such studies occur in Queensland only once or twice per year on average.

The Bill sets out the criteria for an approval to dispose which, amongst other matters, requires the chief executive officer to consider whether the material can be dealt with in another way that is more conducive to ecological health or public amenity or safety and to consider whether disposal would or is likely to result in another Act being contravened, for example the Environmental Protection Act 1994.

The re-use of sealed radioactive substances is being promoted by the department at present, but only where the engineering characteristics of the sources permit this to be done safely. Some sources may be economically re-encapsulated and others may not. However, not all radioactive materials can be released into the environment. In these circumstances, the materials must be relocated to long-term storage facilities, which are typically located in other jurisdictions. The Bill provides for heavy penalties to be paid by persons who dispose of radioactive materials in contravention of the Bill.

An important consideration relating to radioactive waste is the requirement in section 57(d) for the chief executive to have regard to the licensee's intentions for eventual disposal of the radioactive substances as part of the acquisition process. This has already been implemented in practice so that, prior to a licensee acquiring a radiation source, licensees are being required to consider the fate of the source once it is no longer required. This will significantly assist in dealing with the potential waste problem in the future. For example, Queensland Health has been promoting the use of short half-life radioisotopes where these alternatives are available to minimise the eventual waste problem.

The philosophy of reducing the amount of waste generated is intrinsic in all considerations relating to the use and ultimate disposal of radioactive substances. Nevertheless, the Government, through Queensland Health and the Department of Environment and Heritage, will be drafting a

protocol on the management of waste arising from practices using radioactive substances. This protocol will complement the disposal provisions of the Bill.

I thank the Minister and her advisers for the briefings that they have provided to her committee and for the assistance they have given to us and to others who wished to have an input on this Bill. I support the Bill.