Speech by

LINDA LAVARCH

STATE MEMBER FOR KURWONGBAH

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RADIATION SAFETY BILL

Mrs LAVARCH (Kurwongbah—ALP) (3.26 p.m.): I rise to support the Radiation Safety Bill. The main object of this Bill is to protect the public from health risks associated with exposure to certain sources of ionising radiation and non-ionising radiation. The Bill sets up a regulatory scheme to license, to regulate the possession of, and to regulate the use of radiation sources and to also regulate the storing and transportation of radiation sources. It gives the legislative framework for compliance, monitoring, investigation and enforcement of the obligations imposed for radiation safety. Lastly, it establishes the Radiation Advisory Council to advise the Minister with independent advice about the operation of the legislation. I point out to the member for Maroochydore that therein lies the answer to the conflict of interest.

Currently, the use and handling of radioactive substances is regulated by the Radioactive Substances Act 1958. This Act primarily covers the medical use of radiation sources such as X-rays and radium. As the Minister has pointed out in her second-reading speech, in the intervening 40 years since this Act was proclaimed the use of radiation, both ionising and non-ionising, has become commonplace in a diverse range of industries.

But most importantly, in the intervening 40 years since the Radioactive Substances Act 1958 was enacted, the world has learnt some pretty hard lessons about the use of radiation. I imagine that at the time when the 1958 Act was introduced there was still an air of excitement about the prospects of nuclear energy and its development to revolutionise the world. The downside, as in the Three Mile Island and Chernobyl disasters, was not even contemplated. The legacy of these disasters and the ongoing human and environmental effects have put protection from the potential health risks associated with radiation at the forefront of people's minds.

The public has an expectation that it is the Government's responsibility to prevent the use of radiation for purposes or in circumstances that would expose the public to an unacceptable risk of harm. This Bill, in my view, meets that public expectation as it details the Government's responsibility to provide radiation safety and protection principles.

I am pleased that this Bill is being debated and no doubt will be passed prior to the new century. Its enactment will reflect changed society attitudes. Attitudes have changed from simply regulating radioactive substances for medical use to ensuring radiation safety across a broad range of uses for radiation sources. It is also fitting that this Bill comes on the eve of the new millennium as we are now marking a century since the dawn of the nuclear age.

I want to take the opportunity in this debate to revisit the past, for this Bill is a direct outgrowth of historical development. It brings us to a today of providing for radiation safety from a yesterday of scientific curiosity to harness the power of the atom without regard for its consequences. I must say that I am mindful that Henry Ford believed that history is more or less bunk, but I subscribe to the view of the philosopher, George Santayana, that those who fail to study the past are condemned to repeat it. I do not want to bore honourable members with the long and arduous history of the discovery of the atom and atomic theory, but it is relevant to what we know today and relevant to what we are debating here today.

It was just over 100 years ago that a group of scientists unknowingly ushered in this very powerful tool of undisputed usefulness in medicine but also of human destruction. Driven by curiosity,

these men and women explored the nature and functioning of atoms. Their work initiated paths of research that changed our understanding of the building blocks of matter. Their discovery prepared the way for development of new methods and tools to explore the functioning of our bodies in sickness and in health. Their discovery also led the way for powerful armaments and human destruction and misery.

The one striking feature of the history of the discovery of the atom and atomic theory is that it was all an accident of fate. Although in 1803 John Dalton proposed a systematic set of postulates to describe the atom, scientists of his day considered the atom to be merely a subordinate player in chemical reactions, an uninteresting homogenous positively charged glob that contained scattered electrons. That premise remained unchallenged until the end of the 19th century when a series of brilliant discoveries opened the door on the atomic science of the 20th century. It commenced with the work of Wilhelm Konrad Roentgen who, on 22 December 1895, photographed his wife's hand revealing the unmistakable image of her skeleton, complete with wedding ring. Roentgen's wife, who was working in the laboratory with him that day, had accidentally placed her hand in the path of X-rays which Roentgen created by beaming an electron ray energy source onto a cathode tube.

Roentgen's discovery of these mysterious rays capable of producing an image on a photographic plate excited scientists of his day. One such scientist was French physicist Antoine Becquerel, who commenced experiments in a related field. Again, quite by accident, he discovered radioactivity when, on a rainy day, not being able to use the sun as an initiating energy source for his experiments, he wrapped his photographic plates away in a darkened drawer along with some crystals containing uranium. When he returned to his plates, he found that they were exposed during their storage by the invisible emanations from the uranium.

At the time, Marie and Pierre Curie were working in Becquerel's laboratory and after that discovery they devoted their lives to the study of radioactivity. It was their work that introduced the term "radioactive" and led to the realisation that radiation is an atomic property of matter rather than a separate emanation. This work then led to further understanding the structure of the atom. As the saying goes, the rest is history.

However, what was not known 100 years ago but is well understood today is that radiation is a two-edged sword. As I said before, in terms of medical treatment, it has advanced to be used as a preventive and curative tool but it has also caused mass destruction. It may cure cancer but it also causes cancer where there is a high and long-term exposure.

To learn from past mistakes and not repeat history, we must continue to accept responsibility for the appropriate and beneficial uses of radiation. That is exactly what this Bill does. Although there are many aspects to the regulation regime proposed by this Bill, in this debate I want to address the areas of radiation safety and protection as set out in Part 6 of the Bill.

Radiation is used for a diversity of purposes throughout Queensland. Ionising radiation, which will be regulated under the Bill, includes radioactive substances and radiation apparatus. These radioactive substances include iodine 123, which is used to diagnose thyroid disorders; strontium-89, which is used to treat bone cancer; and caesium-137, which is used in the manufacture of alumina to determine the density of the sullage flowing through a pipe. Radiation apparatus includes X-ray equipment used in both medical and veterinary practices as well as cabinet X-ray equipment, which is used for the examination of letters, packages and baggage for security purposes. As well, X-ray equipment is used as a fat analyser in the production of processed meats to ensure that the contents of these goods are consistent.

The Bill will also regulate sources of non-ionising radiation, such as Class IV lasers used to perform medical and cosmetic procedures. Although it is widely accepted that the ionising radiation is harmful and therefore needs to be regulated, not all non-ionising sources of radiation pose significant health risks to people. In our daily lives, we are surrounded by low-level, non-ionising radiation from the microwave oven to the smoke detectors, to the illumination on our watches and, for the parents among us, to the glow in the dark toys that our children have.

The risk posed by a source of non-ionising radiation is dependent upon a number of factors, for example, the amount of radiation emitted by the source; the frequency of the radiation, for example, whether the radiation is infra-red, ultraviolet or microwave radiation; the purpose for which the source is used; and the circumstances under which a source is used. Some sources of non-ionising radiation are already regulated to ensure that adequate levels of safety are maintained. These include the communication frequencies of the electromagnetic spectrum, which are controlled by the Commonwealth Government's Radio Communications Act 1992 for health and other purposes as well as lasers used in wood and plastic pattern making and radio frequency welders used in making a wide variety of plastic products, such as plastic patio chairs and plastic clipboards, which are effectively and adequately regulated by the Workplace Health and Safety Act 1995. However, there are a limited number of non-ionising radiation sources that are not adequately regulated at this time. This Bill picks those up and provides a suitable framework to regulate these harmful sources of non-ionising radiation. As I have said already, radiation is used for a diversity of purposes throughout Queensland.

However, there is no one measure that appropriately controls the risk of radiation for all situations. Measures that were designed to control the risk of radiation exposure in one situation may not be appropriate in another. For example, in industry it is a necessity that barriers be erected around fieldwork whereas in diagnostic radiography there is no such requirement because all medical diagnostic radiography occurs in shielded rooms. Consequently, in order to ensure that all radiation practices are carried out in accordance with recognised radiation safety and protection principles, possession licensees will now be required to have a radiation safety and protection plan. The adequacy of the proposed plan will be evaluated as part of the application process for a possession licence. This Bill sets out the minimum requirements of what must be detailed in a radiation safety and protection plan.

In evaluating whether a proposed licensee has an appropriate radiation safety plan, they will be required to have taken the following matters into consideration: firstly, whether the radiation hazards specific to the radiation source and the radiation practice to be carried out with the radiation source have been identified; secondly, whether an assessment of the health risks specific to the radiation source and radiation practice has been conducted; thirdly, details need to be provided as to how these risks are to be dealt with; fourthly, details need to be provided as to how the implementation and effectiveness of these measures are to be monitored and reviewed; fifthly, details need to be provided regarding the functions of the radiation safety officer to be appointed for the practice; and sixthly, a training program has to be designed to ensure that persons are made aware of the health risks and the measures that are to be implemented or are to prevent or minimise these risks.

However, it is noted that these plans can be tailored to accommodate the needs of a particular business, for example, to take into account the size of a business, the managerial structure of a business and staffing arrangements. It is recognised that the radiation safety and protection plan for diagnostic radiography undertaken by a sole practitioner, such as a dentist, would not be identical to the plan for a large corporation providing diagnostic radiography services. There may be differences between the plans in relation to such matters as the training requirements for those persons carrying out diagnostic radiography or the means for monitoring and reviewing the effectiveness of the plan. The radiation safety and protection plan for a diagnostic radiography practice in a large metropolitan hospital will differ from a plan for an industrial radiography practice, say, testing pipelines throughout the State. These plans would take into account the fact that in a metropolitan hospital, diagnostic radiography would be undertaken in a controlled environment and under circumstances in which the performance of a diagnostic procedure would be subject to scrutiny by peers and supervisors. On the other hand, industrial radiography of pipelines is not undertaken in a controlled environment and the industrial radiographer may be the only radiation expert working in the vicinity and thus not subject to any scrutiny by his or her peers.

Another example may be that the radiation safety and protection plan for a borehole logging company may identify that the loading and unloading of sealed radioactive substances into and out of borehole logging tools is a particular hazard that needs to be addressed in the plan. On the other hand, another borehole logging company may not wish to load and unload the field radioactive substances, preferring instead to have this work performed by a specialist. In this case, the plan will clearly state that no sealed radioactive substances are to be loaded or unloaded into or out of borehole logging tools held by the company other than by a nominated specialist.

While radiation safety and protection plans will differ in certain regards, there is a core set of measures that must be included in the plan for a particular type of radiation practice. These core elements are defined under the Bill as radiation safety and protection measures. Radiation safety and protection measures will be prescribed under a regulation for each type of radiation practice and are designed to prevent or minimise the health risk arising from exposure to radiation from the carrying out of a radiation practice. The radiation safety and protection measures encompass radiation monitoring, control of contamination and control of work practices, as well as strategies to deal with emergent situations.

Another important aspect of the Bill is that possession licensees will be required to appoint a suitably qualified person to undertake the functions of a radiation safety officer. This measure is to ensure that a possession licensee has the necessary expertise to implement, monitor and review those measures designed to promote radiation safety and protection in relation to a particular radiation practice. The functions of a radiation safety officer will include the provision and arrangement of training about radiation hazards associated with a particular radiation source or radiation practice, identifying whether the radiation safety and protection plan is being complied with and making recommendations to the licensee as to what action needs to be taken to ensure compliance with the plan. It also includes regularly reviewing the plan to ensure its continued effectiveness and, as a consequence, making recommendations to the licensee about changes that may need to be made to the plan and, finally, advising the licensee on steps that should be taken consistent with the plan to minimise the radiation doses to achieve a best practice situation consistent with the guiding principle set out in clause 5 of the Bill.

The Bill also recognises that specialist services such as a radiation safety officer can be outsourced by a possession licensee. Persons considered by the chief executive to be suitably qualified will be granted radiation safety officer certificates. This is a change from the current arrangements whereby a person may gain recognition as a radiation safety officer only if a possession licensee appoints that person as a radiation safety officer and only for the period of his or her appointment with that licensee. Under this Bill, a person who has the necessary training and who has been granted a radiation safety officer certificate will be able to offer their services as a radiation safety officer to possession licensees. However, in recognition of the fact that a proportion of possession licensees are able to fulfil the functions of a radiation safety officer themselves, a possession licensee may appoint himself or herself as the radiation safety officer for a radiation practice if the licensee is either the holder of a radiation safety officer certificate relevant to the practice or holds the qualification relevant to the practice prescribed by regulation.

It is envisaged that radiation safety officers for some practices will be appointed on a part-time basis, thus allowing the radiation safety officer to be appointed to a number of businesses at the one time. This will permit a cross-fertilisation of radiation safety ideas throughout those businesses that carry out a similar type of radiation practice.

The Bill also provides for audits to be conducted on the basis of the risk a practice poses. A practice that poses a significant risk will be audited more frequently than one that poses a lesser risk. Whilst the primary objective of an audit is to ensure compliance with the legislation, audits will also provide inspectors with a valuable opportunity to provide licensees with information about improvements that may be made to their businesses to better achieve radiation safety, particularly where such improvements can be achieved at no cost.

In this debate I have touched upon the strengths of the Bill providing for monitoring and the provision of safe work practices, both within an organisation and without, to ensure radiation safety and protection for the entire community. It can be clearly seen that the Radioactive Substances Act 1958 has not kept pace with accepted national and international recommendations for radiation safety and protection. This has resulted in the situation whereby the radiation safety and protection requirements specified under the existing legislation have had to be supplemented by the attachment of conditions to licenses issued under the present Act. This is clearly not acceptable.

Time expired.