



OCKHAM'S RAZOR - MARALINGA AND LUCAS HEIGHTS

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Preface

The following was broadcast in the ABC Radio National series Ockham's Razor on 22 September 2002. Since that time, the government has been forced to abandon its desire to establish a national nuclear waste repository at its then preferred site Evetts Filed West in South Australia. Senator Minchin is no longer the minister responsible for matters of radioactive waste having handed that responsibility to Mr Peter McGauran, and then Brendan Nelson, and later Julie Bishop

The changes have no effect on the story.

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After exploding seven atomic bombs at Maralinga, the British returned to the site known as Taranaki in 1961 to '63 to carry out a series of fifteen trials code-named Vixen B. In these, an atomic bomb was placed on a heavy steel structure erected on a concrete firing pad. The bomb was then exploded in a manner which prevented a nuclear explosion, but the heat of the chemical explosion melted the plutonium core of the bomb, and the force was sufficient to hurl molten plutonium and uranium some eight hundred to a thousand metres into the air. The wind then took over and carried the molten cocktail many kilometres downwind. The result is that hundreds of square kilometres of land in three plumes generally to the north of Taranaki are now contaminated with plutonium and uranium.

The explosion damaged the steel structures so much that none could be used a second time, so these and all of the other plutonium contaminated debris, including the concrete firing pads were buried in shallow pits at Taranaki.

At that time Ernest Titterton was a member of the Atomic Weapons Tests Safety Committee, set up to advise the Australian government on the safety of the British trials. The English born Titterton had earlier been a member of the British group who worked on the Manhattan Project, which was announced to the world in an horrific way at Hiroshima. Because of his background, some have suggested that Titterton did more to represent Britain in safety committee matters than he did Australia.

In 1967, the British Army conducted their final clean-up of Maralinga in Operation Brumby. When that clean-up was finished, Titterton and others from the safety committee visited Maralinga to see what had been done. He and his colleagues were 'extremely satisfied' with what they were shown and complimented the Operation Brumby team. Jolly good show chaps, job well done. On the word of this committee, the Australian government then absolved Britain of any further responsibility for the safety of the site, and everybody was happy - except of course the Aboriginals whose land it was.



I have always marvelled at the ability of the safety committee who were able to say job well done when they had no knowledge of where the contamination lay, nor how the debris was buried.

In the mid-1980s, scientists of the Australian Radiation Laboratory scoured the site and found that the condition was far from satisfactory. Their findings coupled with the conclusions of the McClelland Royal Commission in 1984 led to the latest clean-up.

Basically what was done in this latest effort was to scrape up the most contaminated soil and bury it at least three metres below ground. As the soil was scraped away from Central Taranaki, huge amounts of plutonium-contaminated debris were uncovered. The debris pits were in fact very much larger than British reports indicated. The concrete caps supposedly covering the pits were far too small; one pit was about five times larger than its cap. Two other caps were several metres away from the pits they were supposed to cover.

Had the Titterton committee been more involved, as they should have been, they could not have said "jolly good show chaps". And because they accepted something on which they had no knowledge, they left Australia with a legacy for future clean-ups. Although Britain did contribute about half of the cost of the latest clean-up, when the disgraceful state of the pits was discovered, Australia had no lever to seek a further contribution from Britain.

In the latest clean-up, the Taranaki pits were to have been treated by a process of in situ vitrification in which the pit contents would be converted to a hard glassy rock to immobilise the plutonium for perhaps a million years. The discovery that the pits were much larger than was reported meant that the ISV treatment was going to cost more than had been estimated. Senator Minchin's department then sought ways to reduce the cost. After completing twelve of the planned forty melts, fate came to the rescue of the department. As the thirteenth melt was nearing completion, something in the pit exploded. The equipment was badly damaged and molten glass was thrown some fifty metres from the pit. The department used this as an excuse to cancel the ISV project and instead opted for exhuming the pits and simply burying the debris; an option that was approved by Dr Loy, the chief of the nuclear regulator (ARPANSA). So a process which was agreed by all concerned to be a far superior option was abandoned for one that would not be allowed in Britain, the source of the plutonium.

For several years, the commonwealth government has been searching for a site for a nuclear waste repository and the preferred site is Evetts Field West in South Australia. A particular consideration in this site selection process is the geology of the site. A visitor to the government's web site can see a cross-section of the proposed repository. Short-lived wastes will be packed in drums, which will be placed on a compacted foundation up to twenty metres below ground. The drums will then be covered by up to seven layers of various impervious materials before a covering of soil to ground level. While this is an acceptable design for short-lived wastes, I must ask why is it necessary.

On 17 April 2000, the day after the Maralinga rehabilitation project was the subject of an ABC Radio National broadcast in the Background Briefing series, Dr Loy issued a public statement. He said: "Claims that the clean-up of Maralinga is not to world's best practice are not well founded." So is he saying that the disposal of long-lived plutonium contaminated waste only two metres below ground in a bare hole in totally unsuitable geology is world's best practice? If that is world's best practice for long-lived waste, then it must be so for short-lived waste. And if that's the case, why is the government going to so much trouble to find a suitable site? And why are they proposing to package the waste and cover it with impervious materials in a purpose built facility? Why not simply dig a hole in the ground, anywhere will do, drop in the waste without any packaging, and cover it. Dr Loy has said that is world's best practice, and he is the chief regulator.



I should add that Dr Loy was not the only person to make strange comments about Maralinga. For example, in a Senate Committee hearing on 3 May 2000 we heard public servants declare that soda ash is neutralised by limestone, and that the limestone is rich in sodium and carbonate - no mention of calcium. We also heard that some plastic sheeting covering the plutonium debris will have a life of a few thousand years. Another strange pronouncement was that an estimated radiation dose of 1 milliSievert per annum includes the background radiation of 2.3 millSieverts per annum. Even more astonishing is that the dose of 5 milliSieverts per annum which could be contracted on land contaminated with 3 kiloBequerels of Americium-241 per square metre, and on which the project was based, suddenly dropped to 1 milliSievert per annum, even though no work was done where that level of contamination exists.

Dr Loy's view is also at odds with Senator Minchin's advisory committee who all agreed with me when I was a member of that committee, that ISV is a far superior method of disposal. But the real cruncher to Dr Loy's view is provided by the department itself.

Over the years that the government has been searching for a site for the repository, they have issued several documents for public comment, describing how they are approaching the task. The latest publication was prepared by the National Store Advisory Committee whose membership includes a representative from ARPANSA. Twice in that document we are told that long-lived waste, whether low level or intermediate level, is not suitable for near-surface disposal, but that is exactly what has been done at Maralinga which the regulator describes as world's best practice. The paper asserts that in time, such waste should be disposed of in a deep geological facility.

Add to this the fact that ARPANSA did not have a representative on site when pits at Maralinga were exhumed and the plutonium debris buried, so they have no idea what has been buried, nor how much radioactivity is contained. For this they relied on the word of the contractor. That was what Ernest Titterton did many years ago and his credibility was shattered when the contaminated soil was removed and the plutonium waste was found only a few centimetres below the surface.

While I am not opposed to the construction of a new reactor at Lucas Heights, there are many who are. And when they hear the regulator's view of what constitutes world's best practice, they must ask does he hold similar views about the design and construction of the reactor and everything associated with it. Add to that the technical competence of those within the department responsible for the repository, and it's not hard to understand their opposition. That opposition will surely continue until the government and the regulator set their houses in order and show some consistency and competence in dealing with nuclear matters.

Biographical Note:

Alan Parkinson, BScTech, MScSoc, is a Mechanical and Nuclear Engineer with over 40 years experience. In 1989 he developed some 30 options for rehabilitation of the old atomic bomb test site at Maralinga in South Australia. In 1993, he was appointed a member of the Minister's advisory committee MARTAC (Maralinga Rehabilitation Technical Advisory Committee). He was also appointed the Commonwealth's Representative to oversee the whole of the project. He was removed from both appointments in December 1997 for questioning the proposed future management of the project. He then became an adviser to the Maralinga Tjarutja but withdrew after publicly exposing deficiencies in the management of the project in April 2000. He remains a critic of the Maralinga project and the government's whole approach to disposal of nuclear waste in Australia.