Chapter 2

Background

The tests

2.1 Between October 1952 and October 1957 twelve British atomic weapons detonation tests were conducted in Australia at Monte Bello Islands off the west coast of Western Australia, and at Emu Field and Maralinga in South Australia. The tests were conducted on the following dates:

Operation Hurricane – Monte Bello Islands

- 3 October 1952

Operation Totem – Emu Field

- 15 October 1953
- 27 October 1953

Operation Mosaic – Monte Bello Islands

- 16 May 1956
- 19 June 1956

Operation Buffalo – Maralinga

- 27 September 1956
- 4 October 1956
- 11 October 1956
- 22 October 1956

Operation Antler – Maralinga

- 14 September 1957
- 25 September 1957
- 9 October 1957[1]

2.2 There were also six hundred minor trials, including the testing of bomb components, conducted between 1953 and 1963 at Emu Field and Maralinga. The tests were conducted with the full cooperation of the Commonwealth Government and involved both Australian and British personnel. Tests involving hydrogen bombs were also conducted at Christmas and Malden Islands in the Pacific Ocean, but Australians were not involved in the conduct of these tests.[2]

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1 Gun, R. et al, 2006, *Australian participants in British nuclear tests in Australia, Vol 2: Mortality and cancer incidence*, p. 5.

2 Report of the Review of Veterans' Entitlements, Chapter 16 – British Atomic Tests, p. 373

2.3 Both military and civilian personnel participated in the tests. Different sources provide different estimates of the number of Australians involved. A nominal roll of participants has been compiled by the Department of Veterans affairs. However the roll has been subject to revision over time and concerns about its accuracy remain. The Report of the Review of Veterans' Entitlements released in 2003 stated that the nominal roll contained 15 406 names at that time, 8035 Defence Force personnel and 7371 civilians.[3] A recent study into cancer and mortality incidence among participants in the tests stated that over 16 000 Australians participated in the tests,[4] while the Bills Digest compiled for the Australian Participants in British Nuclear Tests (Treatment) Bill stated that 17 023 Australians participated in the tests.[5] These publications referenced various versions of the nominal roll.

Brief history of studies

2.4 There have been a number of studies and research activities, conducted in Australia and overseas, regarding the effects of the British atomic tests in Australia. These include:

- the Australian Ionising Radiation Advisory Council Report No. 9 provided to government in 1983;[6]
- the 1983 report *Health of Atomic Test Personnel* (commonly referred to as the Donovan Report), based on a survey of Australian test participants;
- the 1984 *Report of the expert committee on the review of data on atmospheric fallout arising from British nuclear tests in Australia*;[7]
- the 1984 Royal Commission into the British nuclear tests in Australia, led by the Hon James McClelland;
- the 1988 and 1993 studies conducted by the UK National Radiological Protection Board on personnel who participated in the tests;[8]

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3 Report of the Review of Veterans' Entitlements, Chapter 16 – British Atomic Tests, p. 375

4 Gun, R. et al, 2006, *Australian participants in British nuclear tests in Australia, Vol 2: Mortality and cancer incidence*, p. xvii and 4.

5 Peter Yeend and Amanda Biggs, Bills Digest, No. 31, 2006–07, Parliamentary Library, p. 3.

6 Australian Ionising Radiation Advisory Council, Report to the Minister for Science and the Environment, *AIRAC Report No, 9*, January 1983. For a summary see Peter Yeend and Amanda Biggs, Bills Digest, No. 31, 2006–07, Parliamentary Library, p. 3.

7 Professor C. B Kerr (Chairman), *Report of the expert committee on the review of data on atmospheric fallout arising from British nuclear tests in Australia*, Atmospheric Fallout Committee, 31 May 1984. For a summary see Peter Yeend and Amanda Biggs, Bills Digest, No. 31, 2006–07, Parliamentary Library, p. 4.

8 See Peter Yeend and Amanda Biggs, Bills Digest, No. 31, 2006–07, Parliamentary Library, p. 5; Gun, R. et al, 2006, *Australian participants in British nuclear tests in Australia, Vol 2: Mortality and cancer incidence*, pp 125–126.

- the development by the Department of Veterans' Affairs of a Nominal Roll of participants involved in the tests;
- the 1990 and 1997 studies of New Zealand participants in the British nuclear tests in the Pacific;[9]
- mortality and morbidity studies of the nuclear test veterans conducted by Sue Rabbit Roff in the UK;[10]
- the 2003 UK study of mortality and cancer incidence in the period 1952–98 among UK participants in the nuclear tests;[11]
- the Australian Participants in British Nuclear Tests in Australia Study, which reported in June 2006.[12]

2.5 The studies have produced different findings and insights into the conduct of the tests and circumstances of the test participants. Reviews of the Donovan report state that definite conclusions about the relationship between participation in the nuclear tests and health effects, such as increased incidence of cancer and infertility, cannot be drawn from the study.[13] Yeend and Biggs note that the survey 'did find a correlation between illnesses and test participation and also a higher incidence of some illnesses with increased exposure to radiation through the tests' but that these incidences 'were mostly ascribed to chance'.[14]

2.6 Summaries of the 1988 and 1993 UK studies present a mixed picture. Some strong associations between participation in the tests and ill health effects found in the first study were not evident in the second study. The authors are reported as concluding that the possibility that test participation had caused a small increase in the risk of non-chronic lymphatic leukaemia could not be ruled out, with the evidence suggesting that the risk was greatest in the early years after the tests.[15] The 2003 UK

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9 See Gun, R. et al, 2006, *Australian participants in British nuclear tests in Australia, Vol 2: Mortality and cancer incidence*, pp 126–127.

10 Submission 10, pp 1–2.

11 Muirhead, C R et al. 'Follow up of mortality and incidence of cancer 1952-1998 in men from the United Kingdom who participated in the United Kingdom's atmospheric nuclear weapon tests and experimental programmes', *Occupational and Environmental Medicine*, 60, 165-72, 2003.

12 Carter, M., Robotham, F., Wise, K., Williams, G. and Crouch, P., *Australian participants in British nuclear tests in Australia, Vol 1: Dosimetry*, May 2006 and Gun, R., Parsons, J., Ryan, P., Crouch, P. and Hiller, J., *Australian participants in British nuclear tests in Australia, Vol 2: Mortality and cancer incidence*, May 2006.

13 See Report of the Review of Veterans' Entitlements, Chapter 16 – British Atomic Tests, p. 374; Gun, R. et al, 2006, *Australian participants in British nuclear tests in Australia, Vol 2: Mortality and cancer incidence*, p. 2.

14 Peter Yeend and Amanda Biggs, Bills Digest, No. 31, 2006–07, Parliamentary Library, p. 4.

15 Summary presented in Gun, R. et al, 2006, *Australian participants in British nuclear tests in Australia, Vol 2: Mortality and cancer incidence*, p. 126.

study was reported as finding that the overall rates of death and cancer incidence among test participants were very similar to a matched control group, and that reports of a raised risk of multiple myeloma amongst test veterans were not substantiated. Again the possibility that test participation caused a small risk of leukaemia (other than chronic lymphatic leukaemia) could not be ruled out.[16]

2.7 A summary of the New Zealand research states that these studies found evidence for a link between haematological cancers and test participation, but no association with other cancers.[17] Sue Rabbit Roff's first study 'suggested that there was an excess of radiogenic cancers and other conditions among the British and New Zealand nuclear veteran respondents'.[18] Her second study 'eventually resulted in proactive health care entitlements for New Zealand test veterans *and their families*' [original emphasis].[19]

2.8 The 1984 Royal Commission in Australia was instrumental for subsequent initiatives that sought and obtained compensation from the British Government relating to the tests. Recommendations arising from the Commission related to the clean up of the test sites, control of access to unsafe areas and compensation for Indigenous owners of the land.[20] The Royal Commission also made recommendations relating to compensation for participants, including:

> The benefits of the Compensation (Commonwealth Government Employees) Act 1971, including the shifting of the onus of proof from the claimant to the Commonwealth, should be extended to include not only members of the armed forces who are at present covered by the Act, but also civilians who were at the test sites at relevant times, and Aborigines and other civilians who may have been exposed to the 'Black Mist'.
>
> To assist the Commissioner for Employees' Compensation in the performance of the additional duties recommended in Recommendation 1, a national register of nuclear veterans, Aborigines and other persons who have been exposed to the 'Black Mist' or exposed to radiation at the tests should be compiled.[21]

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16 Health Protection Agency, Press Release 3/03, 'Third Epidemiological Study of Nuclear Test Veterans', www.hpa.org.uk/hpa/news/nrpb_archive/press_releases/2003/press_release_03_03.htm, (accessed 26 October 2006).

17 Summary presented in Gun, R. et al, 2006, *Australian participants in British nuclear tests in Australia, Vol 2: Mortality and cancer incidence*, p. 127.

18 Submission 10, p. 2.

19 Submission 10, p. 2.

20 See Report of the Review of Veterans' Entitlements, Chapter 16 – British Atomic Tests, p. 374.

21 Quoted in Report of the Review of Veterans' Entitlements, Chapter 16 – British Atomic Tests, p. 374.

The Mortality and Cancer Incidence Study

2.9 The most recent study relating to health effects resulting from participation in the nuclear tests is the Australian Participants in British Nuclear Tests in Australia Study, which was released in June 2006. In July 1999 the Government announced the development of a nominal roll and conduct of a cancer and mortality study. The nominal roll was a prerequisite for the study. The Department of Veterans' Affairs commissioned the Department of Public Health at the University of Adelaide to undertake the study in early 2003. The study was based on 10 983 test participants identified from the nominal roll, of whom 7116 were military and 3867 civilian participants in the tests.[22]

2.10 The study had two main components. One, the dosimetry study, used data from the nuclear tests and modelling techniques to estimate the radiation exposure of participants in the nuclear tests. The other, the mortality and cancer incidence study, compared the number of deaths and cases of cancer among test participants with that in the general population, from 1982 to the end of 2001.

2.11 Staff of the Department of Public Health at the University of Adelaide conducted the study and authored the study report. A Scientific Advisory Committee was established with the role of reviewing and advising on the methodology of the study and supervised the report's preparation. An Exposure Panel was established to reconstruct ionising radiation dose estimates and a Consultative Forum representing twenty organisations and individuals was formed.[23]

2.12 The study estimated that the radiation doses received by Australian participants in the nuclear tests were generally small. The findings state:

> Approximately 79% of the participants were assessed as receiving doses less than 1 mSv that is, approximately half the annual dose received from natural background radiation. Only 4% received more than 20 mSv, the current internationally accepted annual limit for a radiation worker recommended by the International Commission on Radiological Protection.[24]

2.13 The study also reported that some groups did receive significant exposures. The groups estimated to have been exposed to doses of 5mSv or higher were:

- some RAAF aircrew who flew through the contaminated clouds in RAAF or RAF aircraft after nuclear explosions

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22 Gun, R. et al, 2006, *Australian participants in British nuclear tests in Australia, Vol 2: Mortality and cancer incidence*, p. xvii.

23 Carter, M., 2006, *Australian participants in British nuclear tests in Australia, Vol 1: Dosimetry*, Appendices 1–4, pp 159–165.

24 Carter, M., 2006, *Australian participants in British nuclear tests in Australia, Vol 1: Dosimetry*, p. xix.

- crew members from HMAS Hawkesbury who assisted in records recovery and participated in Joint Services Training Unit (JSTU) exercises during Operation Hurricane
- crew and divers from HMAS Koala who recovered a landing craft during Operation Hurricane
- members of the JSTU who undertook radiation monitoring training during Operation Hurricane
- members of the Radiation Hazards group at Operation Totem
- Peace Officers who patrolled contaminated areas
- Indoctrinee Force members at Operation Buffalo
- elements of the Maralinga Range Support Unit who provided a range of engineering and support duties in forward areas from Operation Buffalo through to post Operation Antler activities
- drivers and passengers in contaminated vehicles travelling over contaminated ground
- members of the Australian Health Physics Group (AHPG) who conducted radiation surveillance
- members of the AHPG team who collected Cobalt-60 (60Co) pellets after Operation Antler
- a team that decontaminated and dismantled the DC 12 building in Maralinga Village at the end of the minor trials.[25]

2.14 The overall death rate among the nuclear test participants studied was not significantly different to the general population. However, cancer mortality was found to be 18 per cent higher among the test participants than the general population and cancer incidence was 23 per cent higher.[26]

2.15 The cancer incidence experienced by participants in the tests was significantly higher than the general population across a range of cancer types, including lip, oral cavity and pharynx cancers, cancer of the oesophagus, lung cancer, colorectal cancer, melanoma, prostate cancer and leukaemia.[27] Results were reported separately for the three services and the civilian participants. Some cancers, although not higher across the board, were more prevalent among specific services. For example, mesothelioma

25 Carter, M., 2006, *Australian participants in British nuclear tests in Australia, Vol 1: Dosimetry*, p. xx.

26 Carter, M., 2006, *Australian participants in British nuclear tests in Australia, Vol 1: Dosimetry*, p. xx and xxi.

27 Carter, M., 2006, *Australian participants in British nuclear tests in Australia, Vol 1: Dosimetry*, p. xxi.

was not significantly higher in the test participant group as a whole, but 180% higher among RAN nuclear test participants than the population in general.[28]

2.16 The study found that the increases in cancer rates 'do not appear to have been caused by exposure to radiation'.[29] The report states:

> Neither all cancers combined nor any cancer known to have an association with radiation showed any increase in mortality or incidence with increasing radiation exposure in this cohort.
>
> The lack of association between cancer and radiation is not surprising, given the estimated low radiation exposure of most cohort members, and the relatively small proportion of subjects with any significant exposure.[30]

2.17 The report suggests other possible causes for some of the cancers. For example, the Main Findings state that the increased incidence of mesothelioma among RAN personnel 'is most likely due to asbestos in naval vessels'.[31] In relation to lung cancer, the report states that 'the excess could be due to a higher smoking prevalence in test participants' and that 'some contribution to lung cancer excess is also likely from asbestos in RAN personnel, and possibly in civilian participants also'.[32] However, causal relationships between these factors and the increase in cancer incidence among nuclear test participants were not tested by the study.

2.18 A covering letter to the report by Professor Bruce Armstrong, Chair of the Scientific Advisory Committee to the study, acknowledged some tensions regarding presentation of the study findings:

> Towards the end of the Committee's consideration of the reports, there was contention over the content and wording of some parts of them; particularly the section entitled Main Findings. Most of the Committee members present at the time considered the matters under contention to be matters of presentation not of science. However, the contention was not resolved and Ms Ann Munslow-Davies, the Consultative Forum representative on the Committee, felt, in consequence, that she could not endorse the reports.[33]

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28 Summary presented in Gun, R. et al, 2006, *Australian participants in British nuclear tests in Australia, Vol 2: Mortality and cancer incidence*, pp xxi and 93.

29 Carter, M., 2006, *Australian participants in British nuclear tests in Australia, Vol 1: Dosimetry*, p. vi.

30 Carter, M., 2006, *Australian participants in British nuclear tests in Australia, Vol 1: Dosimetry*, p. xxii.

31 Carter, M., 2006, *Australian participants in British nuclear tests in Australia, Vol 1: Dosimetry*, p. vi.

32 Carter, M., 2006, *Australian participants in British nuclear tests in Australia, Vol 1: Dosimetry*, p. vi.

33 Carter, M., 2006, *Australian participants in British nuclear tests in Australia, Vol 1: Dosimetry*, p. iv.

2.19 Criticisms of the study raised in evidence this inquiry are canvassed in Chapter 4.

Review of Veterans' Entitlements

2.20 In February 2002 an independent review of veterans' entitlements was commissioned by the Hon Danna Vale, Minister for Veterans' Affairs and Minister Assisting the Minster for Defence.[34] Among the terms of reference, the review committee was tasked with reviewing access to Veterans Entitlement Act (VEA) benefits and qualifying service for several specific groups. The terms of reference stated that the review would:

- Consider perceived anomalies with eligibility for access to VEA benefits and qualifying service that might be raised by some World War II veterans, veterans of the British Commonwealth Occupation Forces in Japan, Australian participants in British atomic testing in Australia, Australian service personnel engaged in counter-terrorist and special recovery training, and other interested parties; and
- Recommend possible changes to address any anomalies and to facilitate the equitable and efficient administration of the VEA.[35]

2.21 The review received 160 submissions regarding the British atomic tests. The Report of the Review of Veterans' Entitlements, which has become commonly referred to as the 'Clarke report', noted that the submissions argued for compensation coverage under the VEA through the hazardous service provisions in Part IV of the act. A small number of submissions also sought qualifying service to give access to the service pension.[36]

2.22 According to the Clarke report, coverage as hazardous service under the VEA would provide the following entitlements for those eligible:

- entitlement to claim for the disability pension and for their dependants to claim the war widow's or orphan's pension under the generous standard of proof known as the 'reverse criminal' standard of proof;
- entitlement to the Repatriation Health Card — For Specific Conditions (White Card) for accepted disabilities;

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34 Review of Veterans' Eligibility Provisions and Benefits for Totally and Permanently Incapacitated and Other Veteran Disability Pensioners, commonly referred to as the Review of Veterans' Entitlements.

35 Report of the Review of Veterans' Entitlements, Appendix 1 – Terms of Reference, www.veteransreview.gov.au/report/appendixes/app1.htm, (accessed 13 October 2006).

36 Report of the Review of Veterans' Entitlements, Chapter 16 – British Atomic Tests, p. 371

- access to the Repatriation Health Card — For All Conditions (Gold Card) subject to the VEA criteria being met (e.g. where the rate of disability pension is above 100 per cent); and
- entitlement to the White Card for malignant neoplasm and posttraumatic stress disorder, irrespective of whether the condition is accepted as caused by that service.[37]

2.23 The report assessed that participation in the British nuclear tests could be considered non-warlike hazardous service, on the basis that it met the following criteria for such service:

- the military activity is more hazardous than normal peacetime duty;
- the application of force, if applicable, is limited to self-defence; and
- the threat to members is such that casualties might occur but are not expected.[38]

2.24 The Clarke report concluded that:

> … the British atomic test series was a unique, extraordinary event in Australia's history. Atomic devices were exploded in Australia, with Australian forces potentially exposed to levels of radiation beyond what would today be considered safe levels. By common sense and by any reasonable measure, service in the test operations must be regarded as involving hazards beyond those of normal peacetime duties.[39]

It recommended:

> Participation by Australian Defence Force personnel in the British atomic tests be declared non-warlike hazardous and the legislation be amended to ensure that this declaration can have effect in extending VEA coverage.[40]

2.25 The report also noted that such an extension of the VEA should be unique:

> The recognition of non-warlike hazardous service by the members involved in the tests should be regarded as a *one-off extension of the VEA*. Apart from involvement in wars, other conflicts and overseas deployments, it is difficult to conceive of another Australian military operation in the 20th century comparable to the tests' scale and risk of harm to individuals.[41]

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37 Report of the Review of Veterans' Entitlements, Chapter 16 – British Atomic Tests, p. 372.

38 Report of the Review of Veterans' Entitlements, Chapter 16 – British Atomic Tests, p. 389.

39 Report of the Review of Veterans' Entitlements, Chapter 16 – British Atomic Tests, p. 398.

40 Report of the Review of Veterans' Entitlements, Chapter 16 – British Atomic Tests, p. 399.

41 Report of the Review of Veterans' Entitlements, Chapter 16 – British Atomic Tests, p. 394

2.26 Some submissions to the review raised concerns regarding the hurdles that test participants may face in VEA coverage were extended. These related to the Statements of Principles (SOPs) set by the Repatriation Medical Authority in relation to cancers which must be met for claims to be successful. Concerns included that the SOPs were inadequately researched, that they did not recognise that cancers caused by radiation exposure can metastasise as other types of cancer and that there would be considerable evidentiary difficulties for individuals in showing that they had radiation exposures to the levels required in the SOPs.[42]

2.27 The report noted that at that time the Australian Participants in British Nuclear Tests Cancer and Mortality Study was assessing the possibility of estimating dosages for each of the tests and associated activities. The report considered that such an exercise 'if viable and successfully conducted, could provide the foundation for individuals to make claims of exposure based on their position or placement during and after test explosions'.[43]

2.28 The Review of Veterans' Entitlements did not support a fully presumptive approach to compensation on the basis that it 'would be contrary to the principles and features of the repatriation system'.[44] To resolve the issues of causation, the review considered it important that the cancer and mortality study and exposure estimates be completed quickly. Accordingly, the report recommended that 'the Government move quickly to finalise the cancer and mortality study'.[45]

Government response to the review

2.29 The Government announced its response to the Review of Veterans' Entitlements in March 2004.[46] The response to recommendations relevant to participants in the British nuclear tests were as follows:

> Recommendation
>
> 45. Participation by Australian defence force personnel in the British atomic tests be declared non-warlike hazardous and the legislation be amended to ensure that this declaration can have effect in extending VEA coverage.
>
> Accepted in principle - the Government will respond positively to the needs of those affected by the British Atomic Test programme when the outcomes of the Australian Participants in the British Nuclear Test Programme - Cancer Incidence and Mortality Study are available.

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42 Report of the Review of Veterans' Entitlements, Chapter 16 – British Atomic Tests, p. 383.

43 Report of the Review of Veterans' Entitlements, Chapter 16 – British Atomic Tests, p. 396.

44 Report of the Review of Veterans' Entitlements, Chapter 16 – British Atomic Tests, p. 396.

45 Report of the Review of Veterans' Entitlements, Chapter 16 – British Atomic Tests, p. 399.

46 The Hon John Howard, Prime Minister, *Additional Benefits for Veterans, Government Response to Clarke Report*, Media Release, 2 March 2004.

Recommendation

46. The Government move quickly to finalise the cancer and mortality study.

Accepted - this study is expected to be released in late 2004.[47]

The new entitlements

2.30 The Government's announcement of the health care entitlements provided by the Bills followed the release of the Australian Participants in British Nuclear Tests in Australia Study in June 2006. The Hon Bruce Billson, Minister for Veterans' Affairs and Minister Assisting the Minister for Defence, stated:

> Although the study found that the rate of some cancers among the nuclear test participants was higher than in the general Australian population, it did not find any link between the increase in cancer rates and exposure to radiation.
>
> Despite the lack of association between cancer rates and radiation exposure, the Government has decided that it would be appropriate to provide health cover for nuclear test participants who have any form of cancer.[48]

2.31 The Hon Mr Billson noted that the health care entitlements applied equally to Defence personnel, APS employees and third party civilian contractors. The Minister outlined that the proposed legislation would enable access to treatment for all malignant cancers, such as those affecting the thyroid, stomach, prostate, liver, lung, skin, throat and breast as well as other non-radiogenic cancers.[49]

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47 *Government's Response to the Review of Veterans' Entitlements (The Clarke Report)*, http://minister.dva.gov.au/clarke_report.htm (accessed 11 October 2006).

48 *Nuclear Test Participants to Receive Additional Health Care*, Media Release, 28 June 2006.

49 *Nuclear Test Participants to Receive Additional Health Care*, Media Release, 28 June 2006.