CHAPTER 10

CRITICISMS OF CURRENT PLANS - PART II

SHELTERING

10.1 Sheltering provides protection against external radiation from the plume and from surface deposition, as well as inhalation of airborne contamination.[1] The shielding effect against direct radiation from the passing plume depends heavily on the mass of material between the source and the person. For example, a wooden framed house with no basement will afford little protection, while the basement of a large office building will afford virtually total protection from this source.[2]

10.2 Protection against inhalation depends on the rate of ventilation of the building used as shelter. By turning off ventilation fans and air conditioners, and closing doors and windows before the plume arrives a reduction of up to 90 per cent in the inhalation dose can be achieved.[3] A further reduction can be achieved by measures such as placing layers of moist newspaper or cloth in the chinks of doors and windows.[4]

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1. ANSTO, Radiation Monitoring Handbook for Visits by Nuclear Powered Warships to Australian Ports, (ANSTO, Lucas Heights, NSW, 1985), p. 42 (Evidence, p. 336).
2. ibid. See also International Atomic Energy Agency, Planning for Off-Site Response to Radiation Accidents in Nuclear Facilities, (Safety Series No. 55, IAEA, Vienna, 1981), p. 13.
3. ANSTO, Radiation Monitoring Handbook for Visits by Nuclear Powered Warships to Australian Ports, (ANSTO, Lucas Heights, NSW, 1985), p. 42 (Evidence, p. 336).
4. International Atomic Energy Agency, Planning for Off-Site Response to Radiation Accidents in Nuclear Facilities, (Safety Series No. 55, IAEA, Vienna, 1981), p. 14.

10.3 It is widely accepted that sheltering has a role to play in terms of reactor accidents generally.[5] In the Australian context, consideration of sheltering as a protective measure is relevant primarily where large numbers of residents, office workers, etc. are likely to be within Zone 2, and timely evacuation may present difficulties. Sheltering may be most effective if used as an interim countermeasure, pending evacuation.[6] The evacuation might await either the passing of the radioactive plume or the putting in place of, say, transport arrangements that minimise the possibility of exposure during the evacuation.[7]

10.4 Of the ports currently visited, only in Hobart and Darwin are large numbers of people likely to be within Zone 2.[8] In both places the authorities are confident that rapid evacuation can be effected. While the Hobart Safety Scheme caters

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5. e.g. ibid., p. 15.
6. See, for example, the Hobart Safety Scheme, para. 1113(b), which sets out, as an option, an instruction to shelter as an interim protective measure pending evacuation.
7. e.g. International Atomic Energy Agency, Planning for Off-Site Response to Radiation Accidents in Nuclear Facilities, (Safety Series No. 55, IAEA, Vienna, 1981), p. 19:

> Evacuation requires time, and in some circumstances it may not be feasible during the early phase of the accident. During that stage only relatively small communities can be efficiently evacuated in a timely fashion. ... If evacuation is envisaged during the passage of the plume, it is possible that higher doses might be received by the evacuees than if they were kept in shelter. In addition, it must also be remembered that the time scale for mobilizing vehicles is long, and it may prove impossible to evacuate before the plume arrives.

See also R. P. Gale, 'Immediate Medical Consequences of Nuclear Accidents: Lessons from Chernobyl', Journal of the American Medical Association, 7 August 1987, vol. 258(5), p. 625: the response to the Chernobyl accident:

> indicated that immediate evacuation is not always desirable. In the case of Pripyat, evacuation was postponed until buses could be assembled, escape routes selected to avoid the path of the radioactive plume, and a polymer film sprayed on ground surfaces to reduce the likelihood of inhalation of radioactive dust. The efficacy of this strategy is indicated by by the fact that the population of Pripyat received a lower average radiation dose than individuals living at considerably greater distance from the power station.

8. See the consideration of evacuation in the previous chapter, where a distinction is drawn between evacuation of a central business district and of a major public hospital.

for the use of sheltering,[9] it appears that the authorities in Darwin see no need to consider making detailed provision. The latter position is similar at HMAS STIRLING, where the number of people potentially affected is smaller.

10.5 The Committee accepts that, compared to vessel removal or evacuation, sheltering will often be a less effective countermeasure. The Committee is concerned, however, that the current plans give such limited recognition to the use of sheltering, even as an interim measure pending evacuation.[10] In particular, the Committee considers that insufficient guidance is given to those required to direct the accident response as to when to recommend that the option of sheltering be adopted.

10.6 Accordingly, the Committee RECOMMENDS that the Department of Defence advise the authorities responsible for the individual port safety plans of the need for the plans to contain specific criteria to assist post-accident decision-makers in deciding if sheltering should be adopted as a countermeasure in the particular circumstances prevailing.

PERSONAL PROTECTIVE MEASURES

10.7 Special respiratory protection equipment and protective

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9. cf. the Hobart Safety Scheme, paras. 1113(b), 1204(b) and 1315, and Chapter 12, Annex C which relate to the use of sheltering as an option. The supplement to the scheme, which relates to protective measures to be taken at the Royal Hobart Hospital, also caters for sheltering.
10. cf. A. P. Hull, 'Critical Evaluation of Radiological Measurements and of the Need for Evacuation of the Nearby Public during the Three Mile Island Incident' in Current Nuclear Power Plant Safety Issues: Proceedings of an International Conference Organized by the International Atomic Energy Agency, Stockholm, 20-24 October 1980, (IAEA, Vienna, 1981), vol. 2, p. 94:

> It seems unwise to condition emergency authorities and the public to think almost exclusively in terms of evacuation, as the only available effective and/or most desirable protective measure in the event of a major release from a power reactor.

clothing offer protection against airborne and deposited contamination. But mass distribution of such items and training in their correct use is not a feasible accident response. However, as an International Atomic Energy Agency safety guide indicates, simple respiratory protection:

> may be provided by the use of handkerchiefs, soft absorbent paper products, clothing and other items which can be used to cover the mouth and nostrils. The public can be advised to use such simple items while proceeding to take shelter, and possibly during sheltering. Similar precautions could be recommended while members of the public were being evacuated from a contaminated area.[11]

10.8 The plans for Australian ports make no explicit provision for giving advice to the public on this simple protective measure.[12] The assumption appears to be the same as that relating to sheltering: the effectiveness of evacuation will be such that alternative, less-effective, countermeasures do not need to be planned in detail.

10.9 The Committee noted that the British plan for Liverpool does not make provision for individuals to be advised of the means of achieving respiratory protection. The Committee, however, suggests that advice on simple means of respiratory protection should be given in association with advice to evacuate or to take shelter. The plans should cater for this.

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11. International Atomic Energy Agency, Planning for Off-Site Response to Radiation Accidents in Nuclear Facilities, (Safety Series No. 55, IAEA, Vienna, 1981), p. 22. A table on p. 21 gives the degree of respiratory protection provided by common household and personal items.
12. cf. ANSTO, Radiation Monitoring Handbook for Visits by Nuclear Powered Vessels to Australian Ports, (ANSTO, Lucas Heights, NSW, 1985), p. 43 (Evidence, p. 337), which provides general information on the efficacy of simple measures of respiratory protection.

10.10 The Australian port-specific plans note the possible need for controls on milk and other foodstuffs following a reactor accident.[13] However, no specific provision is made for how or by whom the controls would be implemented except, to some extent, in the Hobart Safety Scheme.[14] In this respect the plans compare unfavourably with the Liverpool Port Safety Scheme.[15]

10.11 The Liverpool Scheme allocates responsibility for arranging and implementing any ban considered necessary on harvesting, sale or consumption of foodstuffs, including locally caught fish. All dairy farms within 9 kilometres of the berth are required to be identified. Provision is made for the collection of milk samples and the place where they will be analysed is identified. Responsibility is also allocated for the collection and disposal of contaminated milk, and the provision of replacement stocks of uncontaminated milk.[16]

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13. WA Port Safety Scheme, paras. 906-07; Darwin Port Safety Plan, paras. 407, 408 (noting that the majority of dairy products are imported from outside the region), 509; Brisbane Port Safety Plan, paras. 112-13; Hobart Safety Scheme, paras. 308, 309, 1407(d) and 1466.
14. The Hobart Safety Scheme, para. 509.
15. UK, Ministry of Defence, Liverpool Special Safety Scheme for Visits to Liverpool by Nuclear Powered Submarines, (April 1986), para. 64.
16. The arrangements set out in UK, Ministry of Defence, Devonport Public Safety Scheme, (1982 edn.), Part 11, are even more detailed. Measures of the kind described in the text are specified in greater detail. Also, pre-addressed envelopes are prepared for all milk producers/retailers and occupiers of other agricultural holdings within 9 km of the berths. Draft letters relating to the consequences of a reactor accident on foodstuffs have been prepared, and arrangements made for delivery of letters in an emergency. Drafts of messages to be broadcast to farmers, etc are included in the plan. The possibility of using police vehicles with loudhailers is also included. Provision is made for the possible ban on consumption of fruit, vegetables and free range eggs produced within 1.5 km of the berth. At the date of the plan a survey had shown only one registered farmer within this radius. Provision is made for amendments to the plan at intervals of not more than 3 months, and a positive check that its details are still correct is required once a year. It should be recalled that Devonport is a submarine base and reactor repairs are done there.

10.12 The Committee considered if provision in Australian plans should be at a similar level of detail. The argument against doing so is that the measures are not ones that need to be taken within minutes, or even the first few hours, following an accident. For example, milk sampling would only be required to begin 24 hours after an accident.[17] On this view, there would be time after the accident to arrange countermeasures in Zone 3. Given the generally non-agricultural nature of the land within 9 kilometres (to use the British figure) of currently approved berths and anchorages, the countermeasures would not be extensive.

10.13 The Committee accepts this view. It does not consider that more extensive planning for countermeasures in Zone 3 is required.

REDUCING THE HAZARD AT SOURCE

10.14 In the abstract, an obvious response to a reactor accident is to try to reduce its consequences by halting or reducing the release of radionuclides from the vessel. In practice, of course, this is not easily achieved. It seemed to the Committee that one possibility worth exploring was the use of spray drenching with water. Given that radioiodine and some other fission products are soluble, the continuous spraying of the vessel, either using its own equipment[18] or from fire-fighting tugs or dock-side fire hoses, might be expected to significantly reduce the releases to the atmosphere.

10.15 The Committee put the possibility of spraying to ANSTO,

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17. UK, Ministry of Defence, Devonport Public Safety Scheme, (1982 edn.), section 1103.
18. Many modern surface ships designed for combat are fitted with devices to spray the exterior of the ship, in order to minimise the effect of sailing through the fallout from a nuclear detonation.

who responded:

> ANSTO officers are not aware of any evidence on the efficacy of water sprays in reducing releases in the event of accidents in nuclear submarines or of any other external action which would reduce releases to atmosphere. Removal of the stricken vessel to a remote anchorage is seen as the most effective means of reducing onshore exposures.[19]

10.16 The Committee accepts that vessel removal is the most effective protective measure. Nonetheless, the Committee considers that the efficacy of water spraying should be investigated further. Spraying has the potential to supplement other protective measures.

10.17 The Committee RECOMMENDS that the Department of Defence and ANSTO investigate whether water-spray drenching of an accident-stricken vessel would provide a useful supplementary protective measure.

EXERCISES

Introduction

10.18 It is generally accepted by planners that the holding of exercises and drills makes a valuable contribution towards ensuring that emergency plans will work if required.[20] The Australian Ionising Radiation Advisory Council (AIRAC) has recommended that exercises play a regular part in the contingency

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19. Evidence, p. 443.450 (ANSTO).
20. e.g. Department of Defence, Natural Disasters Organisation, Australian Counter Disaster Handbook, (Australian Counter Disaster College, Mt Macedon, Vic, 1980), para. 13.19; International Atomic Energy Agency, Emergency Preparedness Exercises for Nuclear Facilities: Preparation, Conduct and Evaluation, (Safety Series No. 73, IAEA, Vienna, 1985), p. 3.

planning for nuclear powered warship visits.[21] The Visiting Ships Panel (Nuclear) agreed with this recommendation.[22] The VSP(N) has provided a 'standard exercise' to assist the States and the Northern Territory in meeting their responsibilities to respond effectively in the unlikely event of an accident.[23]

10.19 At the same time exercises may be costly to run and depend on the contributions and goodwill of volunteers. The issues considered by the Committee were the scope of exercises, particularly the extent to which members of the public should be involved, and the frequency of exercises. The Committee did not have the opportunity to observe an exercise.

Scope

10.20 The Committee was told that exercises in Western Australia and in Hobart have involved the command and control structure of the respective plans, but have not involved the general public.[24] The same appears to be true in the other Australian ports receiving visits.[25] Failure to involve members

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21. AIRAC, 'Review of Safety and Monitoring Arrangements for Visits by Nuclear Powered Warships', p. 5 (Evidence, p. 756).
22. AIRAC, 'Follow-up Actions on Report of Visits to Hobart/Darwin/ Brisbane', p. 6 (Evidence, p. 766).
23. Second supplementary submission from the Department of Defence, p. 15 (Evidence, p. 238.270). See also ANSTO, Radiation Monitoring Handbook for Visits by Nuclear Powered Warships to Australia, (ANSTO, Lucas Heights, NSW, 1985), p. 10 (Evidence, p. 304) for details on who is responsible for testing various aspects of the plans, and for a set of test data for use in exercises.
24. Information supplied at briefings to Committee members by WA officials, 1 February 1988; Tasmanian officials, 21 March 1988.
25. See the second supplementary submission from the Department of Defence, pp. 15-16 (Evidence, p. 238.270-71), where it is said that the scope of exercise activations involves among other things:
    > actual deployment of the radiation monitoring teams, relay of exercise monitoring reports, plotting and reactions. This latter segment is not blatantly public, so as to avoid any public inconvenience but it does ensure that teams are trained to a satisfactory operational level and the AAEC [now ANSTO] supplied equipment is performing to specification.

of the public in exercises was criticised in some submissions.[26]

10.21 Exercises involving the public are not normally held in Australia for other types of emergency plans. The Committee was given no reason why the plans that were the subject of its inquiry should be treated differently in this regard.

10.22 Only in Darwin and Hobart would the occurrence of the reference accident lead to a possible need for many members of the public to take protective measures in the first 24 hours after an accident. This is due to the relative isolation from populated areas of the berths and anchorages used elsewhere. Even in Darwin and Hobart, the numbers affected within Zones 1 and 2 are relatively small. In contrast, the number of people who might be required to take protective measures following a land-based reactor accident in the United States is much larger.[27] For this reason, the Committee does not regard requirements relating to exercises for these reactors[28] as directly relevant to Australian port safety plans.

10.23 The Committee does not regard the failure of exercises to involve the general public as a valid ground of criticism.

10.24 A further issue was whether the exercises that are held are sufficiently detailed, even accepting that they should stop

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26. e.g. see the submissions from Assoc Prof P. Jennings. p. 3; Senator J. Vallentine, p. 11 (Evidence, p. 1054); People for Nuclear Disarmament, pp. 5-6 (Evidence, pp. 1307-08); Ms S. Taylor, p. 1.
27. The inhalation hazard zone for planning purposes for US land-based commercial reactors has been set at 10 miles (16 km): 10 Code of Federal Regulations 50.47(16)(c)(2). This compares with the 2.2 km Zone 2 used in Australian planning for the much smaller naval reactors.
28. The requirements are set out in 10 Code of Federal Regulations 50, Appendix E, Part IV(F). The required exercises are graded, with a 'full participation' exercise being required as part of the initial licensing process and at least once every 7 years thereafter. A full participation exercise is defined as including licensee, State and local government personnel in sufficient numbers to verify the capability to respond to the accident scenario. The scope of the exercise shall be such 'as is reasonably achievable without mandatory public participation'.

short of public involvement. The representative of the Natural Disasters Organisation (NDO) on the Visiting Ships Panel (Nuclear) expressed the view in 1986:

> The operational element of the VSP(N) has long felt that the State/Territory exercises have failed to adequately test their operations room staffs but the fundamental problem has been and remains the fact that such procedures remain a State/Territory responsibility. In short, we can propose courses of action or content of exercises but we cannot direct.[29]

10.25 The NDO representative outlined a very detailed 'standard exercise', which involved measures 'to a point just short of causing alarm to the public', and suggested it be put to State/Territory planners.[30] The Committee noted that AIRAC did not recommend that exercises be held in this depth, although it endorsed the holding of exercises.[31] The organisations with the central role in implementing the port safety plans, the State/Territory emergency services, are regularly involved in responding to emergencies of various kinds. It might be argued that their general expertise obviates the need for very detailed exercises specifically relating to the port safety schemes.

10.26 The Committee RECOMMENDS that no visit to a port be allowed unless the Visiting Ships Panel (Nuclear) is satisfied, after consultation with the relevant State/Territory planners, that the safety plan for that port has been exercised in sufficient depth to demonstrate its adequacy and efficacy.

Frequency

10.27 The view has been taken by Tasmanian planners that there

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29. 'Standard Exercise for Use at All Cleared Ports/Anchorages Immediately Prior to an NPW Visit', (undated paper presented to VSP(N) on 7 August 1986), para. 4.
30. ibid., para. 7.
31. ibid., para. 3; AIRAC, 'Review of Safety and Monitoring Arrangements for Visits by Nuclear Powered Warships', p. 5 (Evidence, p. 756).

is no necessity to hold exercises until just prior to a visit.[32] Exercises are generally held at other ports in conjunction with visits also.[33] This accords with the recommendation in OPSMAN 1:

> State/Territory authorities should conduct exercise activations of their Port Safety Organisations prior to the visit of a NPW, especially where those visits are infrequent or when key personnel change.[34]

10.28 There is no requirement in either the Commonwealth documentation or the port-specific plans to hold exercises at set intervals. The Committee noted that the frequency of exercises in relation to land-based reactors in the United States is closely regulated, with the least detailed level of exercise being required at least once a year.[35] For land-based reactors generally, the International Atomic Energy Agency suggests that the interval between major exercises should be not less than 12

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32. Information supplied at briefing to Committee members by Tasmanian officials, 21 March 1988. See also the submission from the Tasmanian Government, p. 4.
33. In 1982 for example, a training exercise was held in February in Western Australia involving Commonwealth and State officials; in April in Brisbane to coincide with a visit; and in May in Hobart, again in conjunction with a visit: Department of Home Affairs and Environment, Visits by Nuclear Powered Warships to Australian Ports: Report on Radiation Monitoring during 1982, (DHAE, Canberra, 1983), pp. 6, 7 and 9. Other reports in this annual series note exercises held during the reporting year. In a paper prepared by the Natural Disasters Organisation representative on the VSP(N) for presentation to it on 7 August 1986, 'Standard Exercise for Use at All Cleared Ports/Anchorages Immediately Prior to an NPW Visit', it is noted (para. 1):
    > Since the resumption of NPW visits in 1976 it has been standard practice to conduct a radiation monitoring exercise immediately prior to a visit, with the aim of:
    > a. verifying the serviceability of both fixed and mobile radiation monitoring equipment; and
    > b. exercising the State/Territory radiation monitoring teams, Radiation Officer and S/TES operations team in response to a simulated controlled release of radioactive material to atmosphere.
34. OPSMAN 1 (2nd edn.), para. 447 (Evidence, p. 81).
35. 10 Code of Federal Regulations 50, Appendix E, Part IV(F)(2). This requirement relates to the licensee's emergency plan. Less frequent exercises are required for emergency plans involving off-site use of State and local government resources.

months or more than 36 months.[36]

10.29 The Committee sees no need for a requirement for exercises at fixed periods. Unlike land-based reactors, for a naval reactor the time in which an accident may occur is limited to the period of the visit. There is, in the Committee's view, no reason to maintain a readiness to respond to an accident when no visits are due.[37] Visits are notified sufficiently far in advance to permit any necessary refresher exercise to be held before the vessel arrives.[38]

10.30 It does not appear to the Committee that the need to hold exercises with sufficient frequency has been neglected. Nonetheless, the Committee considers that there be formal requirements imposed, so as to ensure a satisfactory frequency of exercises. The Committee considers that the requirement to hold an exercise should take account of both the period since the last exercise and any change in key personnel since than.

10.31 Accordingly, the Committee RECOMMENDS that no visit to a port be allowed unless, immediately before the visit, there has been an exercise of the port safety organisation. No exercise should be required, however, if an exercise has been held at the port during the previous 12 months, and there has been no change in key personnel since that exercise.

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36. International Atomic Energy Agency, Emergency Preparedness Exercises for Nuclear Facilities: Preparation, Conduct and Evaluation, (Safety Series No. 73, IAEA, Vienna, 1985) p. 7.
37. cf. the Clyde area public safety scheme, which covers areas in Scotland around bases used by US and UK nuclear powered vessels, is exercised four times a year, with a major field exercise held every three years: UK, Parliamentary Debates (Commons), 6th series, vol. 140, Written Answers, 10 November 1988, col. 303. Vessel presence at the bases would be much higher than at Australian ports, which receive only occasional visits.
38. OPSMAN 1 (2nd edn.), para. 310 (Evidence, p. 63) states that public notification is usually given 10 days prior to a visit. But State/Territory Governments are notified when the visit request is made and of the decision on the request: ibid., para. 301 (Evidence, p. 60).

10.32 The WA Port Safety Scheme provides for a Port Nuclear Safety Panel and states:

> The functions of the panel are to handle all the routine arrangements relating to the Port with respect to nuclear powered warship visits. This includes:
> a. maintaining a communications link between the ship(s) and the Western Australian State Emergency Service,
> b. provid[ing] an officer to assist the officer-in-charge of Zone 1 responsible for the evacuation of the zone should it be necessary.
> The Port Nuclear Safety Panel is required to meet, at the discretion of the Chairman, prior to and following the visit of a nuclear powered warship.[39]

10.33 Senator Vallentine informed the Committee that she had been told by the Director of the Western Australian State Emergency Service that the WA Port Nuclear Safety Panel did not meet either before or after the 18-24 July 1986 visit to Western Australia by three United States nuclear powered surface ships.[40] Senator Vallentine put the argument that if the Chairman of the Panel did not think it appropriate that it meet on that occasion, it must be doubted if it would ever meet at all.

10.34 In addition, the Committee had difficulty understanding the concept of a Panel that is required to meet, yet whose chairman has a discretion on whether the meeting should take place.

10.35 The Committee sought further information from the chairman of the Panel, the Director of the Western Australian State Emergency Service, who replied:

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39. WA Port Safety Scheme, paras. 208-09.
40. Letter from Senator J. Vallentine, 19 August 1988, p. 2.

> I cannot recall specific details of my discussions with Senator Vallentine, however my records show that the Port Nuclear Safety Panel met, prior to the ships' arrival, on 2 July, 1986 and again on 28 July, 1986 following the ships' departure.[41]

10.36 On the matter of discretionary meetings, the Director explained:

> The discretion permitted the Chairman of this panel in calling for meetings is based on the fact that the frequency of visits, and thus the familiarity of panel members with the arrangements required, allowed the Chairman to co-ordinate these matters by telephone, without having to assemble members for what has become routine for each visit. This, however, is only likely if the visit is by a single ship like a submarine or similar class vessel.[42]

10.37 The Committee does not consider the existence of a discretion on this basis to be inappropriate. However, the Committee considers that the wording of the Scheme could usefully be amended to make clear the reason for, and scope of, the discretion.

10.38 Senator Vallentine also drew the Committee's attention to what she regarded as a further example of lack of preparedness in practice. The WA Port Safety Scheme, paragraph SP B5, states in part: 'The availability of essential equipment, services and documentation at the State Emergency Operations Centre is to be confirmed prior to the visit'. Senator Vallentine said that her discussions in 1986 with the State Emergency Service Director and

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41. Letter from the Director, WA State Emergency Service, 16 December 1988, p. 1. The Director also noted that, while the Panel had operational responsibilities, another body, the WA Visits Co-ordinating Committee, had planning responsibility. Because it has no operational responsibilities:
> there is therefore no need for the WA Visits Co-ordinating Committee to meet prior to each visit. Not withstanding the above, the WA Visits Co-ordinating Committee usually meets once or twice a year and whenever a situation dictates, to examine particular issues and ensure the currency of the scheme.

42. ibid.

Deputy Director indicated that this confirmation did not occur in practice.[43] Neither person, for example, could tell her how much protective clothing was available or where it was located.

10.39 The Committee noted in paragraphs 8.131-8.132 that the documentation relating to visits does not contain complete lists of the personnel or equipment required to carry out monitoring. Similarly, there is no comprehensive list in any of the available documentation of those for whom protective clothing would be required.[44]

10.40 The Director of the Western Australian State Emergency Service informed the Committee that approximately 25 sets of protective clothing for use in relation to the WA Port Safety Scheme are held at HMAS STIRLING by the Navy for issue prior to each visit.[45] The Director noted that protective clothing is

> only required for those persons likely to be involved in directly dealing with the ship concerned ... [such as] the crew of the navy tugs, navy shore parties, fire fighters, and the Police crew of water craft likely to be involved in securing the surrounds of a ship at anchorage, or in movement during an incident.[46]

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43. Letter from Senator J. Vallentine, 19 August 1988, p. 2.
44. OPSMAN 1 (2nd edn.), Chapter 4, Annexes F and G (Evidence, pp. 102-03) deal with the protective clothing for shore parties and towing vessel crews. ANSTO, Radiation Monitoring Handbook for Visits by Nuclear Powered Warships to Australian Ports, (ANSTO, Lucas Heights, NSW, 1985), p. 47 (Evidence, p. 341) lists the protective clothing required by a mobile radiation monitoring team.
45. Letter from the Director, WA State Emergency Service, 16 December 1988, p. 2.
46. ibid.

DECONTAMINATION

Introduction

10.41 Criticisms were made in submissions of the current plans for what was seen as insufficient provision for decontamination.[47] Decontamination requirements following an accident can be placed under two headings: immediate decontamination of persons, vehicles, etc. evacuating from close to the vessel, and longer term decontamination of areas affected by deposition from the airborne plume.

Decontamination of Persons

10.42 ANSTO's Radiation Monitoring Handbook states:

> Personal decontamination is necessary only in the case of detected or suspected skin contamination. In general, ordinary shower facilities are adequate. If large numbers of people are involved and showering is not feasible, the careful removal of outer garments followed by the washing of hands, face and possibly hair could be sufficient. Personal decontamination can be of prime importance for some people who were outdoors under the plume, as contamination of the skin and especially of the hair may contribute a large dose.[48]

10.43 The Handbook recommends that decontamination of Zone 1

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47. e.g. submissions from Prof W. J. Davis, pp. 82-85 (Evidence, pp. 529-32); Esperance Nuclear Awareness, p. 1; Scientists Against Nuclear Arms (WA) and Medical Association for the Prevention of War (WA), p. 13 (Evidence, p. 799). See also letter from Mr M. Lynch, 23 March 1988, p. 2 (Evidence, p. 915).

48. ANSTO, Radiation Monitoring Handbook for Visits by Nuclear Powered Warships to Australian Ports, (ANSTO, Lucas Heights, NSW, 1985), p. 44 (Evidence, p. 338). During a 1987 fire at ANSTO's Lucas Heights research laboratories 4 persons were contaminated by radiation. 'All contamination was quickly removed by washing with soap and water': ANSTO, Report of the Committee of Inquiry into a Fire which Occurred on 18 March 1987 in a Radioisotope Processing Cell, Building 54 at the Lucas Heights Research Laboratories, (ANSTO, Lucas Heights, NSW, 1987), p. 3.

evacuees 'will be arranged, as necessary and with advice from the RMG [Radiation Monitoring Group], by the officer in charge of zone 1'.[49] The Handbook also states that contamination control points should be defined during the planning stages of a visit. The points should be near Zone 1, and are usually located at port security control points. They should be equipped with a hose or other water facilities for use in decontamination of persons and vehicles leaving the area.[50]

10.44 Of the plans examined by the Committee, only the HMAS STIRLING Sub-Plan meets the criteria in the Handbook. It designates the shower block required to be used as a personnel decontamination station, with provision made for loan of clothing to those who have been decontaminated.[51] There is also a requirement that controls be exercised over vehicles departing Zone 1, until they have been cleared of contamination.[52] The Committee considered that, if provisions are to be required (on which see below), the decontamination provisions in this plan provide a general model for other Australian plans.

10.45 For Gage Roads off Fremantle, there is little need for decontamination points: the anchorages are several kilometres off shore and no land lies within any of the Zone 1's. The WA Port Safety Plan does not require decontamination of any small craft or those on board who may have been close to, and downwind of, the vessel.

10.46 The Hobart Safety Scheme requires that civilian evacuees from the vessel be held at named control points in order to be checked for radioactive contamination: 'further actions will be as required' by the State Radiation Officer.[53] There is no

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49. ibid., p. 13 (Evidence, p. 307).
50. ibid., p. 28 (Evidence, p. 322).
51. Para. 1310(12).
52. Paras. 1310(13) and 1310(15).
53. Hobart Safety Scheme, para. 1115. See also ibid., paras. 1305(d), 1306(h), 1311(b) and 1316.

provision for monitoring and decontaminating other evacuees from Zone 1. The Committee was told that adequate showering facilities existed near the only alongside berth used, which is at Macquarie Wharves.[54] The Tasmanian Government also informed the Committee that a decontamination unit was available to treat members of the public if required.[55]

10.47 The plans for Brisbane and Darwin make no provision for personal decontamination of those evacuating from Zone 1. In both cases it is possible that significant numbers of port workers and others will be in the Zone 1's for the berths used.

10.48 On the need for personal decontamination provisions in the plans, the Radiation Monitoring Handbook states:

> It is anticipated that contamination control would only be needed in rare circumstances and at a later stage of the reference accident.[56]

10.49 The Committee was unclear, as a result of this, to what extent planning for personal decontamination measures ought to be required. If the planned immediate evacuation of Zone 1 is successful, at most only a handful of persons would be present at a later stage of the accident to become contaminated. These persons, all presumably emergency personnel, would not require a control point and mass decontamination facility. Their limited requirements could be met without need for specific provision in the plans.

10.50 If, contrary to the view in the Radiation Monitoring Handbook, measures were required at the outset of the accident, it is unlikely that personnel monitoring could be organised in

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54. Information supplied at briefing to Committee members by Tasmanian officials, 21 March 1988.
55. Submission from the Tasmanian Government, p. 4.
56. ANSTO, Radiation Monitoring Handbook for Visits by Nuclear Powered Warships to Australian Ports, (ANSTO, Lucas Heights, NSW, 1985), p. 28 (Evidence, p. 322).

time to deal with the immediate evacuees from Zone 1. The absence of monitoring facilities is perhaps not critical if decontamination facilities are available, as a worst-case assumption can be made and all evacuees decontaminated.

10.51 However, a delay could be expected in organising anything more than rudimentary decontamination facilities, except at berths where shower blocks existed near the exits as part of the ordinary port facilities. To hold the evacuees at the control point near the Zone 1 perimeter, pending the arrival of mobile decontamination facilities, might result in increased exposure to airborne contamination.

10.52 Because the Committee lacks the information to state confidently that personal decontamination would not be required, it concludes that provision should be made for it in all the Australian plans.

10.53 The Committee RECOMMENDS that port safety plans for alongside berths include arrangements, such as those existing for HMAS STIRLING, for the monitoring of evacuees from Zone 1, and for the decontamination of those found to be contaminated. For anchorages, where the Zone 1 comprises no land area, the Committee RECOMMENDS that the plans require that advice be given to those who might be within Zone 1 and downwind of the vessel of the need to take decontamination measures.

10.54 The advice could be passed via marine radio, public broadcasts, police water patrols or other means. No decontamination facilities need to be specifically provided, given the ready availability of water for washing.

Other Decontamination

10.55 In addition to a possible need to decontaminate those near the vessel at the time of the accident, a need may also

arise to deal with contaminated areas. The extent of this latter need can only be determined by radiation monitoring carried out following the accident. The radiation monitoring guidelines make provision for this to be done.[57] The Radiation Monitoring Handbook provides details on how the monitoring and subsequent decontamination is to be done.[58]

10.56 The Committee does not consider that plans should be required to contain detailed provision for surface decontamination. Until monitoring has defined the scope of any need to decontaminate there is little specific provision that could be usefully included in plans. The necessary monitoring facilities are provided for. Other requirements for a decontamination program could be met from locally available resources and personnel without the need for prior planning. Given the characteristics of the reference accident, the extent of any decontamination required is not likely to be major.

ROLE OF FIREFIGHTERS

Introduction

10.57 The Committee was made aware that some firefighters considered that they have been inadequately trained for what they

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57. Department of Defence, Environmental Radiation Monitoring during Visits of Nuclear Powered Warships to Australian Ports: Requirements, Arrangements and Procedures, (May 1988), pp. 8-9. For an earlier version of these provisions see Evidence, pp. 289-90.
58. ANSTO, Radiation Monitoring Handbook for Visits by Nuclear Powered Warships to Australian Ports, (ANSTO, Lucas Heights, NSW, 1985), pp. 18, 28-29, 45 (Evidence, pp. 312, 322-23, 339). For further detail on decontamination procedures see International Atomic Energy Agency, Manual on Decontamination of Surfaces, (Safety Series No. 48, IAEA, Vienna, 1979).

assumed would be their role following a reactor accident.[59] The Committee wrote to relevant unions in June 1988 seeking their views. The unions in Tasmania and Western Australia did not respond. Replies from other unions supported the claims of inadequate training.[60]

10.58 In order to determine the merits of this claim, it was necessary for the Committee to determine in what ways fire-fighters might be involved, based on the reference accident. One possible role relates to post-accident decontamination. Fire-fighters might also be involved in dealing with the accident directly if it involved a fire on the vessel.

Decontamination Role

10.59 The HMAS STIRLING Sub-Plan makes no provision for civilian firefighters to be involved at any stage of a reactor accident. Although the WA Port Safety Plan similarly makes no provision, members of the Committee were told by officials that the fire brigade might be used to assist with decontamination.[61] The Brisbane Safety Plan provides that the Metropolitan Fire Brigade is responsible for the 'normal firefighting role, and assistance with decontamination of any affected surfaces'.[62] The plans for Darwin and Hobart do not refer to firefighters.

10.60 The Committee noted that the NSW Fire Brigade is assigned a role in decontamination under the safety plan for the

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59. Evidence, p. 1388 (Coalition Against Nuclear Armed & Powered Ships); p. 1395 (Senator McMullan); submission from the NSW Fire Brigade Employees' Union, p. 7; 'Firemen want nuclear accident plan for US ships', Advertiser (Adelaide), 20 October 1986, p. 3.
60. Submission from the NSW Fire Brigade Employees' Union, p. 7; letter from the United Firefighters' Union (Vic), 21 July 1988; letter from the Australian Fire Service Unions, 1 August 1988; United Firefighters Union (Qld), 4 August 1988.
61. Information supplied at briefing to Committee members by WA officials, 1 February 1988.
62. Para. 332.

ANSTO reactor at Lucas Heights near Sydney.[63] The NSW Fire Brigade Employees' Union told the Committee that its members had not been provided with radiation decontamination training, nor the special equipment it regarded as necessary for the task.[64] The plan, however, indicates that no special training is required, and any special items of equipment required will be supplied by ANSTO.[65]

10.61 This appeared to the Committee to apply also in the context of the plans which form the subject of this inquiry,[66] although the plans are not explicit on the point. Some equipment needed, such as respirators and protective clothing, is part of the standard equipment of firefighters.[67] Other items, such as dosemeters and special cleaning fluids, could readily be supplied at the site.

10.62 There is no reason why the surface decontamination measures with which firefighters are expected to be involved will be urgent. Once any required evacuation has been completed, the immediate threat to health ceases. The need to avoid inconvenience and to permit general entry to the evacuated area govern the speed with which decontamination must be done. Equipment

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63. ANSTO, APTCARE-Lucas Heights: A Plan to Cope with Accidents at the Research Establishment of the Australian Atomic Energy Commission, Lucas Heights, NSW, (ANSTO, Lucas Heights, NSW, 1986), para. 303.4.
64. Submission from the NSW Fire Brigade Employees' Union, p. 7.
65. ANSTO, APTCARE-Lucas Heights: A Plan to Cope with Accidents at the Research Establishment of the Australian Atomic Energy Commission, Lucas Heights, NSW, (ANSTO, Lucas Heights, NSW, 1986), Annex I, para. 3.
66. cf. First supplementary submission from the Department of Defence, Part 6B (Evidence, p. 238.251): in response to the criticism that the Australian Defence Force has no training in decontamination, the Department of Defence stated that the plans do not envisage any direct role by the ADF in decontamination, and that decontamination would be coordinated by, and draw on the expertise of, ANSTO.
67. Submission from the NSW Fire Brigade Employees' Union, p. 8. See also ANSTO, Report of the Committee of Inquiry into a Fire which Occurred on 18 March 1987 in a Radioisotope Processing Cell, Building 54 at the Lucas Heights Research Laboratories, (ANSTO, Lucas Heights, NSW, 1987), p. 6: NSW Fire Brigade fire appliances which attended the fire were equipped with protective clothing for fire personnel should it have been needed.

required to be delivered from ANSTO stores at Lucas Heights near Sydney would be available in less than 12 hours even at the more distant ports such as Darwin and HMAS STIRLING in Western Australia.[68]

10.63 Therefore, there would be adequate time to ensure that all were appropriately equipped and that any required system of radiation exposure control was in place. Radiation experts would be on hand to direct activities to ensure that they were conducted in a safe manner. For these reasons, the Committee considers that it is unnecessary to provide specific training to firefighters with respect to any role that they might have in post-accident surface decontamination measures.

Firefighting Role

10.64 A fire may occur on a nuclear powered vessel without necessarily involving the reactor. The scenarios leading to the reference accident do not require fire as its cause. If the reference accident occurred, there is no reason why a fire would be expected to result. Therefore the need to plan for fire-fighting in a radioactive environment is much smaller than the already very small likelihood of the reference accident occurring.

10.65 It appeared to the Committee that there is a need for a system of radiation exposure control to be in place to ensure that firefighters do not exceed recommended exposure levels. But apart from this, fighting a fire in a radioactive environment appeared to be similar to fighting fires in other situations where respiratory protection and protective clothing needed to be

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68. OPSMAN 1 (2nd edn.), Chapter 4, Annex I details the arrangements to achieve this, including the use of facilities at Sydney airport and an RAAF transport aircraft from Richmond RAAF base: 'these arrangements should make the resources available, eg in HMAS STIRLING within 10 hours'.

worn.[69] Civilian firefighters would not need to be self-sufficient in radiation exposure control, as the plans provide for radiation monitoring experts to be present. Although Australian planning is not dependent on them, members of the vessel's crew would also probably be available to provide expert direction.

10.66 Moreover, naval vessels possess their own firefighting equipment and their crews are trained in fighting fires on board the particular vessel. Civilian firefighters lack the same degree of specialised knowledge and training. Therefore, it appeared to the Committee that civilian firefighters would not be expected to lead, or probably even to play a subordinate role in, the response to a fire on a nuclear powered warship.

10.67 The firefighters' unions did not refer to any occasion on which their members had been called on to deal with a fire on a visiting naval vessel. The Committee is not aware of any such occasion. Although the Brisbane Port Safety plan refers to fire-fighters carrying out their normal firefighting role, it is not clear that this role includes fighting fires on visiting war-ships. The other Australian port safety plans make no provision for civilian firefighters to have a fire fighting role.

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69. For a general textbook dealing with firefighting in the presence of radiation hazards, see L. Whitman, Fire Safety in the Atomic Age, (Nelson-Hall, Chicago, 1980). For the lessons learned from firefighting in 1986 at Chernobyl, see Organisation for Economic Cooperation and Development, Nuclear Energy Agency, Chernobyl and the Safety of Nuclear Reactors in OECD Countries: Report by an NEA Group of Experts, (OECD, Paris, 1987), p. 64. See also International Atomic Energy Agency, Summary Report on the Post-Accident Review Meeting on the Chernobyl Accident: Report by the International Nuclear Safety Advisory Group, (IAEA, Vienna, 1986), p. 11: in regard to Chernobyl, 'fighting fires in a nuclear power plant with an added large scale radiological hazard was an entirely new experience'. The particular difficulties experienced in firefighting at Chernobyl are noted ibid., pp. 44-45. One, burning graphite, would not be present on a visiting warship. Another, lack of equipment to place firefighters on the roof of the reactor building, is also not relevant to warship visits. Other issues noted, such as the need for fire-fighting robots, are also more relevant to the scale of the Chernobyl accident than the much smaller scale of any accident that could occur on a visiting warship. The report also notes the need for lightweight clothing for both heat and radiation protection.

10.68 For all these reasons, the Committee does not envisage any need for civilian firefighters to receive specialist training to deal with fires aboard visiting nuclear powered warships. However, the Committee considers that the correctness of this view should be confirmed (see paragraph 10.70).

10.69 If it is correct, the Committee considers that the wording of the port safety plans could usefully be amended so as to make clear that civilian firefighters are not expected to play a primary role in dealing with the highly unlikely event of a combination of a fire and reactor radiation hazard aboard a visiting warship. If it is not correct, either generally or in respect of a particular port, the Committee considers that civilian firefighters should receive any necessary training for the role assigned to them in the relevant plan.

10.70 Accordingly, the Committee RECOMMENDS that the Department of Defence, based on consultation with the navies of the countries to which the visiting warships belong, provide guidance to State/Territory planners on the planned role of civilian firefighters in the highly unlikely event of a combined fire and radiation hazard on a visiting nuclear powered warship. The Department should attempt to ensure that plans make clear either the role that civilian firefighters have, or the fact that they have no role, as the case may be. If the role requires specialist training and equipment, these should be provided as part of the plans.

PUBLIC INFORMATION FOLLOWING AN ACCIDENT

Introduction

10.71 Issues relating to the availability of plans and provision of information prior to nuclear powered warship visits

were discussed in chapter 8. The occurrence of any nuclear accident or incident, however trivial, can be expected to create intense media and public interest.[70] The same is true of a false alarm or rumour that an accident has occurred.

10.72 It is important, in the Committee's view, that plans are in place to respond to the expected demand for information.[71] The provision of timely and accurate information will play a major role in allaying unnecessary concerns and assisting in an orderly implementation of any protective measures that might be required.

10.73 For example, a report into a fire at ANSTO's Lucas Heights Research Laboratories (LHRL) noted that ANSTO:

> has acknowledged that procedures implemented on the occasion of the fire at LHRL on 18 March 1987 did not cope adequately with providing information to the media and the general public. One consequence which resulted in widespread criticism, especially from local residents, was that credible information was not available to the public to counterbalance the alarmist media reports which were broadcast within minutes of the call to the NSW Fire Brigade. Apart from the unnecessary alarm among local residents, a further more general consequence was the inaccurate impressions throughout Australia and internationally that there had been a major reactor incident.[72]

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70. See for example ANSTO, Public Information during Incidents at Lucas Heights Research Laboratories, (ANSTO, Lucas Heights, NSW, 25 March 1987), p. 2, for the initial sensationalised and inaccurate treatment by the electronic media of a minor fire at Lucas Heights on 18 March 1987. The fire did not involve the reactor at the site.
71. cf. T. P. Haire, 'Emergency Preparedness in the Central Electricity Generating Board: Development of Emergency Procedures Following the Three Mile Island Accident' in International Atomic Energy Agency, Operational Safety of Nuclear Power Plants: Proceedings of an International Symposium, Marseilles, 2-6 May 1983, (IAEA, Vienna, 1984), vol. 2, p. 392:
> The accident at Three Mile Island emphasized the need for the rapid, clear, reliable and authoritative issue of information to the public.
72. ANSTO, Public Information during Incidents at Lucas Heights Research Laboratories, (ANSTO, Lucas Heights, NSW, 25 March 1987), p. 1.

10.74 It appeared to the Committee that experts agree it is desirable that post-accident information should be provided to the public as far as possible through a single information centre.[73] In order that this centre retain credibility it must be in a position to provide accurate, timely and authoritative statements, and to respond to questions. In this context, journalists have said that:

> it was important to have a spokesman who both understood the technicalities and was able to explain them to the media. Ideally, this spokesman should not himself be involved in operational aspects, so that his main role could be that of a communicator.[74]

10.75 The Department of Defence has stated that port safety plans should include draft messages and instructions to the public relating to an accident.[75] After insertion of the

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73. e.g. International Atomic Energy Agency, Planning for Off-Site Response to Radiation Accidents in Nuclear Facilities, (Safety Series No. 55, IAEA, Vienna, 1981), p. 59; 'Panel: Informing the Public' in International Atomic Energy Agency, Current Nuclear Power Plant Safety Issues: Proceedings of an International Conference, Stockholm, 20-24 October 1980, (IAEA, Vienna, 1981), vol. 1, pp. 354-56; J. Scanlon and others, 'Coping with the Media in Disasters: Some Predictable Problems', Public Administration Review, January 1985, vol. 45(S), p. 126. See also ANSTO, Public Information during Incidents at Lucas Heights Research Laboratories, (ANSTO, Lucas Heights, NSW, 25 March 1987), p. 4: as one of the actions to be implemented following the unsatisfactory public information response to the 18 March 1987 fire at Lucas Heights, 'a permanently equipped public information facility will be constructed for use on all occasions when there is a high demand for public information'. It is stated that the facility will have multiple dedicated PABX extensions, TV and radio to permit monitoring of media reporting of the course of incidents, and word processing facilities to assist in the rapid preparation of media releases: ibid., pp. 4-5.

74. 'Panel: Informing the Public' in International Atomic Eneregy Agency, Current Nuclear Power Plant Safety Issues: Proceedings of an International Conference, Stockholm, 20-24 October 1980, (IAEA, Vienna, 1981), vol. 1, p. 356.

75. OPSMAN 1 (2nd edn.), Chapter 4, Annex H, para. 8(d) (Evidence, p. 110). This requirement is generally recognised as being an appropriate one. e.g. see International Atomic Energy Agency, Planning for Off-Site Response to Radiation Accidents in Nuclear Facilities, (Safety Series No. 55, IAEA, Vienna, 1981), p. 58. See also, for example, the prepared messages in UK, Ministry of Defence, Liverpool Special Safety Scheme for Visits to Liverpool by Nuclear Powered Submarines, (April 1986), Annex 2A.

appropriate factual information, these can be released to the media with a minimum of delay.

Provisions in the Plans

10.76 Measured against these criteria, the Australian port safety plans make inadequate provision for public information following an accident.

10.77 Of the existing plans, the WA Port Safety Scheme sets out reasonably detailed requirements relating to public information.[76] The media liaison office, to which all public inquiries are to be directed, is located at the State Emergency Operations Centre. The staffing, duties, and message-release authority of the office are all defined. The Hobart Safety Scheme contains similar provisions.[77] Members of the Committee who inspected the Centres in February and March 1988 were satisfied with the range of facilities available for providing public information.

10.78 The HMAS STIRLING Sub-Plan makes no provision for public information following an accident. It is unclear if it is intended that the WA Port Safety Scheme provisions apply with regard to this aspect of any accident that occurs at HMAS STIRLING.[78] The Committee considers that this lack of clarity should be remedied.

10.79 The Committee had no information on how the demand for public information would be met following a nuclear powered warship accident at the approved anchorage at Jervis Bay. The anchorage at Jervis Bay is sufficiently far from shore and from

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76. Paras. 801-07.
77. Paras. 1201-1210 and 1456-59.
78. The inference is that they do not, as para. 1315 duplicates that part of the provisions of the WA Port Safety Scheme (paras. 801-02) that relates to information in routine, non-emergency, situations. If all the provisions of the WA Port Safety Scheme (ie. paras. 801-07) were intended to apply to HMAS STIRLING there would be no need to duplicate two of them.

heavily populated areas to render unnecessary all the elements of planning required for berths such as those at, say, Hobart or Darwin.[79] However, this does not, in the Committee's view, diminish the need for planning to meet the post-accident demand for public information.

10.80 The Brisbane Port Safety Plan makes no detailed provision for public information, nor does it state that provision is made in some other, more general, counter-disaster plan.[80]

10.81 The Darwin Port Safety Plan provides: that the Territory Counter Disaster Controller has responsibility to authorise dissemination of information; that only information which is authorised by this person is to be released to the media; and that 'the Protocol and Public Relations Unit, Department of the Chief Minister is the official source of all media and public information'.[81] No indication is given of the location of the information distribution point, of where press briefings will be held, etc.[82]

10.82 None of the plans examined makes provision for anyone with expertise in either nuclear reactors or radiation to be on

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79. See above, paras. 9.123-9.124, for the Committee's conclusions to this effect.
80. The table forming Annex A to Chapter 4 of the Plan allocates to the Executive Officer, State Counter-Disaster Organization and Director, State Emergency Service the function of co-ordinating the release of public information following an alarm. However, the narrative describing the roles of these officers and their organisations (paras. 325-27) does not refer to the provision of public information. An inference might be made that any procedures of the organisations relating to information provision in regard to disasters generally would also apply to a nuclear powered warship accident.
81. Paras. 1101-03.
82. However, the Committee is aware that the relevant personnel possess considerable experience gained in cyclone emergencies in providing public information relating to emergencies.

hand to brief the media.[83] The Committee considers this unsatisfactory, although it understands that in the event of an accident one of the functions of the Commonwealth technical adviser[84] would be to assist in the provision of public information. The Committee also recognises that State and Territory emergency services personnel have considerable experience in providing public information in non-nuclear accidents and emergencies.

10.83 No provision is made in the port safety plans for input from, or coordination with, media liaison activities by the Commonwealth or the country to which the warship belongs. Of the plans examined, only that for Hobart contains draft media releases.[85]

10.84 The Committee considers it important that the various authorities, civil and military, of the foreign government are in a position to present a coordinated response to the public, and that this response is also coordinated with the response by Australian authorities.

10.85 Because of the widespread assumption in the community that all nuclear powered vessels visiting Australia carry nuclear weapons, the Committee considers it important that one of the

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83. cf. T. P. Haire, 'Emergency Preparedness in the Central Electricity Generating Board: Development of Emergency Procedures Following the Three Mile Island Accident' in International Atomic Energy Agency, Operational Safety of Nuclear Power Plants: Proceedings of an International Symposium, Marseilles, 2-6 May 1983, (IAEA, Vienna, 1984), vol. 2, p. 395:

> The TMI accident emphasized the importance of accurate determination of the radiation dose received by members of the public. The widespread public concern and the demand for information on the level of dose received showed that it would be necessary to have precise figures available with the necessary assurance on the small effect of low doses in order to recover and retain public confidence.

84. See for example, the WA Port Safety Scheme, para. 213(c), the Darwin Port Safety Plan, para. 704(f), the Brisbane Safety Plan, para. 324 and the Hobart Safety Scheme, para. 319 on the provision of a Comonwealth Technical Adviser. The adviser is a senior radiation specialist.
85. Hobart Safety Scheme, Chapter 12, Annexes A-E.

officials assigned to provide public information following a reactor accident be sufficiently well-informed to make credible statements on the nuclear weapon safety position also. In practice, the media may not regard as accurate statements on either the technical aspects of the reactor accident or the risk to nuclear weapons which will be assumed to be on board, unless the statements are made or endorsed by a spokesperson for the foreign country.[86]

10.86 The Committee noted that, in United States nuclear weapon accident plans intended to apply in other countries, detailed provision is made for a coordinated public information response.[87] As part of this, provision is made for holding of joint United States/host-country news conferences, and for the demarcation of the public information roles of the United States military and the United States embassy in the host country.[88] The Committee had no information on United States or British plans relating to provision of public information following a reactor accident on one of their vessels while in a foreign port.

10.87 The Committee RECOMMENDS that the Department of Defence confirm that, with regard to the public information response to a reactor accident on a visiting warship, measures are in place to ensure:

(a) that the response of Commonwealth bodies, the State/Territory concerned, and the country to which the warship belongs be coordinated through a single information centre;

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86. As noted in chapter 13, the policy of neither confirming nor denying the presence of nuclear weapons would not limit the provision of information, as one of the standard exceptions to that policy permits the presence of nuclear weapons to be confirmed or denied when necessary to allay public alarm: see paras. 13.44-13.45.
87. e.g. see US, Department of Defense, Directive No. 5230.16 (Nuclear Accident and Incident Public Affairs Guidance) (Encl 3), 7 February 1983, p. 2.
88. e.g. US, United States European Command, USCINCEUR CONPLAN 4367-87-Response to Nuclear Accidents/Incidents within the Theater, 1987, pp. F-1 - F-6.

(b) that technical expertise about naval reactors, nuclear weapons, radiation effects and safety measures be available to that information centre; and

(c) that before visits are approved these public information measures be in place.

10.88 The Committee has no firm view on whether it is essential to have media statements prepared beforehand. The Committee would expect that issue to be resolved by the Department of Defence as part of the steps taken to coordinate the State/Territory, Commonwealth, and foreign country roles in the public information response.

10.89 The Committee noted that the public information provisions in the safety plan (APTCARE) for ANSTO's Lucas Heights Research Laboratories are broadly similar to the more detailed provisions in some of the current port safety plans.[89] The APTCARE provisions were tested by the fire that occurred at Lucas Heights on 18 March 1987. A subsequent report recommended:

> that the emergency information provisions of APTCARE be reviewed by the State Authorities in conjunction with AAEC [now ANSTO]. The experiences of 18 March 1987 suggest that the procedures outlined in the APTCARE document (p. 28) cannot cope with the level of information demand which could be expected.[90]

10.90 The Committee is concerned that the public information arrangements under at least some of the plans subject to its inquiry may be similarly deficient in relation to the volume of inquiries that might be received. Members of the Committee who inspected the facilities at the Tasmanian and Western Australian

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89. See ANSTO, APTCARE-Lucas Heights: A Plan to Cope with Accidents at the Research Establishment of the Australian Atomic Energy Commission, Lucas Heights, NSW, (ANSTO, Lucas Heights, NSW, 1986), Annex E, Appendix 2.

90. ANSTO, Public Information during Incidents at Lucas Heights Research Laboratories, (ANSTO, Lucas Heights, NSW, 25 March 1987), p. 6.

State Emergency Service headquarters and considered them suitable in this regard.[91] But the Committee did not inspect the facilities in all places receiving visits.

10.91 Accordingly, the Committee RECOMMENDS that the Department of Defence ensure that the report on the inadequacies of the public information provisions of APTCARE are drawn to the attention of State/Territory planners, together with the results of the review of these provisions in APTCARE. Further, the Department should ensure that the planners incorporate in their plans all relevant lessons of the public information response at Lucas Heights following the 18 March 1987 fire there.

FOREIGN COUNTRY INVOLVEMENT IN ACCIDENT RESPONSE

Introduction

10.92 The Committee noted that a 1984 report by a subcommittee of the Visiting Ships Panel (Nuclear) on post-accident vessel removal concluded:

> There is a total lack of knowledge of the contingency procedures that the United States authorities (both internal and external to the NPW) would implement in the event of a reactor incident. ... Recommendations contained in this Report may be found in practice to be incompatible with mutually co-operative efforts to resolve an incident.[92]

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91. For example, the Tasmanian State Emergency Service telephone equipment has the ability to automatically transfer calls from an overloaded switchboard to another number at, say, the Police Operations Room. Plans have been made to ensure that this Room remains operational following an accident even though it is in an area (Zone 2) that might require evacuation: Hobart Safety Scheme, Chapter 14, Annex D, para. 3.
92. Department of Defence, VSP(N), Report on the Protection of Personnel Engaged in the Removal of Nuclear Powered Vessels Following a Reactor Accident, (18 May 1984), paras. 19 and 21.

10.93 The need to integrate the actions of the foreign country to which the warship belongs with those of Australian authorities has already been considered in two contexts. One relates to the provision of public information.[93] The other concerns the requirement that an anchored warship's crew release its anchor to permit post-accident vessel removal.[94] The Committee considered if the need to integrate contingency procedures extended to other aspects of planning.

10.94 Under the current demarcation in contingency planning, the warship's crew are responsible for actions required to be taken on board the vessel. Australian plans cater for all responses required elsewhere, including vessel removal.[95]

Appropriateness of the Current Planning Demarcation

10.95 The Department of Defence informed the Committee that it is not the practice of the United States to devise integrated plans with countries hosting visits.[96] The Department expressed the view that it would be inappropriate for the foreign country to which the warship belonged to prepare detailed plans to respond to a reactor accident in an Australian port. Planning that extended beyond the warship itself would intrude on Australia's sovereign responsibility to coordinate the accident response in one of its ports.[97] The Committee regards this view as correct.

10.96 The Committee could foresee difficulties if the warship's crew were to be integrated into Australian planning in ways that required them to act under the direction of Australian authorities. In addition, it would not be possible to predict in

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93. Paras. 10.83-10.87.
94. Paras. 9.64-9.69.
95. e.g. see Evidence, p. 1300.44 (Department of Defence).
96. Evidence, p. 1300.43 (Department of Defence).
97. First supplementary submission from the Department of Defence, Part 4 (Evidence, p. 238.245).

advance how many of the crew would be available and what expertise the particular members who were available would have. The visiting warships have differing crew sizes. More importantly, the events of an accident may have killed or injured some of the crew, or made their presence essential on board the vessel itself.

10.97 The Committee considers that there are sufficient Australian resources to operate the Australian plans in the period immediately after the accident. Therefore the Committee could see no need to integrate the warship's crew into those plans. The current demarcation of spheres of planning responsibility is, in the Committee's view, appropriate from the perspectives of Australian sovereignty and effective use of resources.[98]

Potential for Conflict between Uncoordinated Plans?

10.98 However, the issue remains whether lack of knowledge by local planners of the contingency arrangements applying on the warship would reduce the effectiveness of the local response. The lack of knowledge arises because, according to the Australian Department of Defence, 'the USN has advised that it is forbidden under the Atomic Energy Act from discussing the details of its emergency response procedures'.[99]

10.99 Australian authorities have adopted two types of measures to reduce the likelihood of conflict. The first is to make sure that the content of the local port safety plan is made known to the commander of each visiting warship.[100] No formal, written assurance has been obtained from the United States Navy that the responses outlined in these plans will not conflict with the planned response on the warship. However, informal assurances

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98. Evidence, p. 1300.44 (Department of Defence): it is not clear that integration of plans would result in savings in Australian resources and costs.
99. Evidence, p. 1300.43 (Department of Defence).
100. ibid.

have been given that there is no conflict between the two sets of planned responses.

10.100 The second means adopted to prevent conflicting accident responses is to ensure that visiting warship commanders are aware of the need for co-operation, and that a communication channel exists to facilitate post-accident co-operation.[101]

10.101 As a result of these measures, the Department of Defence told the Committee that:

> there is virtually no risk that the independent accident reactions of the crew of a visiting NPW and those of local authorities/services will lessen the effectiveness of each.[102]

10.102 The Committee accepted this view, both because the current demarcation of planning responsibilities minimises the likelihood of conflict and because of the other steps taken to avoid conflicting accident-responses.

Possible Overlap in Monitoring Arrangements

10.103 The Committee noted that the standard statements of assurances by both the United States and United Kingdom provide in respect of a visit by one of their nuclear powered warships:

> During the period of the visit, the personnel of the nuclear-powered warship will be responsible for radiological control on board the ship and for environmental monitoring in its immediate vicinity.[103]

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101. ibid.
102. Evidence, p. 1300.44 (Department of Defence). The Department also noted that 'the planned efficient communication between the NPW and the controller of the local safety organisation would minimise the scope for confusion'.
103. US, 'Standard Statement', para. 2(b) (Evidence, p. 1078). See also the virtually identical UK statement, para. 2(b) (Evidence, p. 1300.16).

10.104 These assurances are addressed to any country that receives a visit, not specifically to Australia. The Committee notes that, independently of this, environmental monitoring in the vicinity of the vessel during port visits is undertaken by Australian personnel.

COMPENSATION ISSUES

Introduction

10.105 A number of legal issues would confront someone seeking compensation for injury to their person or property resulting from a reactor accident aboard a visiting warship. The issues, which are referred to in more detail in Appendix 4, include questions of proof, the standard of liability, and the steps required to recover compensation from a foreign country either through the courts or through administrative means.

10.106 The port safety plans are, in the Committee's view, operational documents designed to guide the immediate response to an accident should it occur. The Committee does not consider that the broader legal issues relating to compensation of individuals for injuries received ought to be addressed in these plans. Moreover, for the reasons given in chapter 8, the Committee has not made recommendations on these issues. However, the Committee did consider the issues of record keeping and a possible register of those present in the vicinity of the accident as these matters related directly to planning.

10.107 Resolution of subsequent legal claims will be greatly assisted if accurate records of the course of the accident and of the accident response are made and retained. This is because there may be a long latency period before an injury caused by

exposure to a low dose of radiation becomes apparent. Compensation claims may need to be considered many years after the accident. The main matter of concern to individuals is that a record should be made of their presence at particular locations, of the level of radiation at those locations, and of the fact of being advised to evacuate, being monitored, or undergoing decontamination.

Present Provisions

10.108 The port plans make little explicit provision for recording personal details and movements. The general absence in the current plans of detailed provisions on evacuation and decontamination was noted earlier in this chapter. It follows that on the whole the plans make no provision for record keeping in respect of these activities.

10.109 An exception to these comments is the HMAS STIRLING Sub-Plan, which notes the general importance of keeping adequate records and particularises categories of activities which efforts must be made to record.[104] In addition, ANSTO's Radiation Monitoring Handbook states that, in the context of making provision for decontamination, the names and addresses of all contaminated persons, together with details of the contamination, must be recorded by the team surveying those leaving Zone 1 following an accident.[105]

Proposed Changes

10.110 The Department of Defence told the Committee that it regarded provision for the listing of people possibly exposed to

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104. See also the Hobart Safety Scheme, para. 1314(d) (register of civilians evacuated from the vessel) and para. 1427 (register of evacuees referred to the designated assembly areas, to enable queries from friends and relatives to be answered).

105. ANSTO, Radiation Monitoring Handbook for Visits by Nuclear Powered Warships to Australian Ports, (ANSTO, Lucas Heights, NSW, 1985), p. 28 (Evidence, p. 322).

higher than normal radiation doses as an option for inclusion in the individual port safety plans by those responsible for the individual plans.[106] The Committee considers that all the Australian plans should be required to facilitate record keeping of this nature.

10.111 The Committee acknowledges that in the immediate aftermath of a serious accident precise record keeping may present difficulties. The Committee noted that the Natural Disasters Organisation has developed a computer-based system called the 'National Registration and Inquiry System'. This is designed to assist in locating and keeping track of persons following large-scale accidents and natural disasters.[107] The Committee understands that the system is sufficiently flexible to be used for keeping records of persons' presence at or near the scene of a reactor accident on a visiting warship, together with information on any exposure to radiation they received, decontamination undergone, etc.

10.112 Therefore, the Committee RECOMMENDS that steps be taken to make better provision in the port safety plans for the making and long-term keeping of records of individuals' presence in the vicinity of the vessel at the time of an accident, of the levels of radiation to which they might have been exposed, and of any evacuation or decontamination which they may have undergone. In particular, the Committee RECOMMENDS that the Natural Disasters Organisation's 'National Inquiry and Registration System' be examined with a view to using it to provide a means of recording and preserving this information.

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106. Evidence, p. 1300.45 (Department of Defence).
107. See Department of Defence, Natural Disasters Organisation, Australian Counter Disaster Handbook, (Australian Counter Disaster College, Mt Macedon, Vic., 1980), chapter 12, for details. Under the system record-keeping can be either manual or computer-based. The manual version is used as a matter of routine by emergency services. The computerised version, which is more appropriate to large-scale disasters, was last used as part of the response to the 1983 Ash Wednesday bushfires.

10.113 In relation to civil nuclear installations, in the United Kingdom a system has been devised under which members of the general public can register the fact that they were in the area affected by a nuclear reactor accident.[108] The aim is to provide a source of evidence of this fact so as to assist the individual in the event that he or she wishes to bring a claim for compensation years after the event. The register is no more than a source of evidence. It does not prevent other evidence being brought to disprove the material set out in the register.[109] But, in the absence of other evidence, the facts as set out in the register would prevail.

10.114 Although the legislation requiring this system does not apply to ship-borne reactors, the United Kingdom authorities plan to use the system following a reactor accident to a Royal Navy submarine in a United Kingdom port. Registration forms would be distributed through local post offices.

10.115 The Committee considered whether a similar system would be useful in Australia, and if so, whether it should be a State/Territory or Commonwealth scheme. On balance, the Committee does not consider that a scheme of this type should be required. In the United Kingdom a scheme existing for other reasons is extended to apply to submarine reactor accidents. In Australia, the scheme would need to be specifically devised in respect to warship visits.

10.116 Unlike in the position in the United Kingdom where the scheme applies to civil reactors, a scheme of this type has not been judged necessary in relation to the Commonwealth's own nuclear reactor at Lucas Heights, NSW. An element of discrimination might be seen to arise if the Commonwealth were to

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108. The Nuclear Installations Act 1965 (UK), s. 23 provides the basis for the system, with details contained in subordinate legislation.
109. Nuclear Installations Act 1965 (UK), s. 23(1): '... registration in respect of any person shall be sufficient evidence of his presence within that area during that period unless the contrary is proved ...'.

facilitate compensation claims against a foreign country in a way that it is not prepared to do for claims against itself.

10.117 The more significant reasons why the Committee does not consider a registration scheme should be required relate to the limited benefits it would achieve. As already noted registration operates as no more than a source of proof. In the absence of the registration scheme individuals will still have available other means of establishing the facts that would be evidenced by registration.

10.118 Many of the individuals most likely to have been exposed to radiation will have been recorded under the improved record keeping recommended above. Others, including many emergency personnel and port workers, would be able to rely on employment or similar records. Any individual concerned about their possible exposure can always make an appropriately witnessed written record of their whereabouts for possible use as evidence in years to come.