CHAPTER 5

TRANSPORTATION

5.1 The risks involved during transportation of radioactive waste are of major concern to the public, and the alleged leakage of radioactive material from a drum during the transport of contaminated soil from Lucas Heights to Woomera prompted the establishment of this Inquiry. There is community concern that it is during transport that the 'human factor' makes accidents most likely.[1] There is a tradeoff between the risks of storing radioactive waste in populous areas, and the risks involved in moving it to more remote locations.

Current Transport Regulations

5.2 Regulations at the Commonwealth level relevant to the transport of radioactive waste vary depending on the mode of transportation. The Civil Aviation Authority has responsibility for air transport, the Australian Maritime Safety Agency for sea transport and the Department of Transport for land transport at the Commonwealth level.

5.3 However, the responsibility for the implementation of the national Transport Code is at the State/Territory level.[2] The legislation for the proposed Australian Institute of Radiation Protection will incorporate the national Transport Code. This will provide the Commonwealth with a means of regulating Commonwealth bodies' transport arrangements and will overcome the current lack of regulatory control in this area.[3]

5.4 The *Code of Practice for the Safe Transport of Radioactive Substances* is based on the International Atomic Energy *Agency's Regulations for the Safe Transport of Radioactive Material 1988* and the National Health and Medical Research Councils standards. It is currently being revised.

5.5 The National Road Transport Commission is reforming land transport regulation generally. The model for the National Road Transport Commission Act is based on a Commonwealth-State arrangement in which a ministerial

---

1 Women Opposing Uranium Mining, Submission No. 39, p. 5

2 Makeham, Transcript of Evidence, p. 683

3 Johnston, Transcript of Evidence, p. 692

council will vote on proposed regulations to be implemented by State legislation.[4] It was pointed out that:

> The commission legislation is capable of handling radioactive materials, but, at the end of the day, most land transport, except perhaps for Commonwealth materials, would be regulated by state legislation in any event.[5]

Mr Nigel Wood (Manager of Technical Operations, Australian Radioisotopes) explaining to the Committee the types of IAEA approved packages which are used to transport medical radioisotopes from ANSTO to hospitals (Photograph provided by ANSTO)

4 Makeham, Transcript of Evidence, p. 689

5 Ibid, p. 689

The Committee inspecting two containers used for transporting waste between the Australian Radioisotopes Laboratories to the on-site waste management facilities. The fibre-board drum on the left contains slightly contaminated solid trash. The metal cask contains very low activity liquid waste. Both types of waste are a consequence of radioisotope production for medical applications (Photograph provided by ANSTO).

Incidents Involving Transport of Radioactive Materials

5.6 When radioactive soil was dug up from CSIRO's Fishermens Bend property in Victoria for transport to Lucas Heights some of it had a high moisture content. Subsequently, during transportation of this material from Lucas Heights to Woomera, the soil settled to the bottom of the drums and the water rose to the top. Each drum was sealed with the lid and then banded, but when two drums rubbed against each other during transportation, one of the seals was disturbed and water was able to leak out during transit through Port Augusta.[6] In the incident there was in effect no leakage of radioactive material:

6 Burns, Transcript of Evidence, p. 100

> The measure was 0.15 microsieverts per hour compared with the background radiation level in South Australia which varies from about 0.07 microsieverts per hour to more than 0.2 microsieverts per hour.[7]

The incident was, however, widely reported and caused considerable community concern.

5.7 A second incident to receive media attention during the transportation of contaminated soil from Lucas Heights to Woomera was a reported leakage from a drum during transit through the suburbs of Sydney. This incident turned out to be rain water which had been caught on the top of the drum which was dislodged with the movement of the vehicle.

5.8 The Committee was also told that there were two incidents in which medical radioisotope containers were run over at airports, though in both cases there was no leakage. In these incidents the packaging withstood the impact of two tonne trucks, as it was designed to do.[8]

Transport Risks

5.9 In considering the risk involved in transporting radioactive material important factors are: the minimum amount of handling required; frequency; and nature of the transport. The Committee was told that there have been no significant incidents in the transportation of radioactive materials in the last 30 years and the Department of Transport considers that the distance transported is not a primary issue, provided there are appropriate safeguards written into the Transport Code.[9] If radioactive materials are of a higher level, the distance involved becomes a more important factor to be considered.[10]

5.10 Notwithstanding the absence of major incidents, a commercial industrial gauge company which moves radioactive sources in gauges for use at mine sites around Australia has had difficulty in getting transport companies to take this cargo. It was suggested to the Committee that this was a perceived rather than an actual hazard.[11]

---

7 Codd M (1995) *Review of Arrangements for the Recent Transportation of Radioactive Waste*, July 1995, p. 16

8 Munslow-Davies, Transcript of Evidence, p. 309

9 Makeham, Transcript of Evidence, p. 687

10 Ibid, p. 688

11 Munslow-Davies, Transcript of Evidence, p. 309-310

5.11 Senator Cook (former Minister for Industry, Science and Technology) designated the shipment of spent fuel rods from Lucas Heights to the United Kingdom under the *Environment Protection (Impact of Proposals) Act 1974* to ensure that transportation arrangements are open to public scrutiny.[12] The spent fuel rods are be transported by road in Australia and the United Kingdom. ANSTO has prepared a risk assessment study and concluded that:

> the road transport phase of the shipment, in both Australia and the United Kingdom, will have no environmental or health consequences for workers or the public, taking into account both normal incident-free operations and a range of possible accident scenarios encompassing accident severities up to and beyond the maximum credible accident.[13]

5.12 The first load of 110 fuel rods was moved through Sydney suburbs about midnight on the 18 April 1996 to be loaded on the merchant vessel Condock bound for Dounreay in Scotland. Despite the presence of a police convoy and a fire brigade unit, Greenpeace were concerned that there were still some unresolved safety issues.

5.13 In developing the proposal for the Mt Walton waste repository, Western Australia, considerable attention was given to the question of whether waste should be moved by road or rail. The environmental approval of the Mt Walton site allows for small quantities of material to be moved by road but the question should be reconsidered for larger quantities.[14]

5.14 Although there is a general assumption that rail travel is safer, the Committee was told that in Western Australia the rail system has a high accident record.[15] Last year a train was derailed on the Queensland Sunshine Coast hinterland, though the radioactive waste containers did not split open.[16]

5.15 Air transport should not be discounted, considering Australia's excellent air safety record and the long distances over which material may have to be

---

12 Senator Peter Cook (former Minister for Industry, Science and Technology) and Senator Bob Collins (former Minister for Primary Industries and Energy) *'Spent Nuclear Fuel to Leave Australia'* Joint Media Release, 27 October 1995, p. 1

13 Australian Nuclear Science & Technology Organisation (1995) *Public Environment Report, Transport of HIFAR Spent Fuel from Lucas Heights Research Establishment to the United Kingdom for Reprocessing,* October 1995, p. 30

14 Davies, Transcript of Evidence, p. 270

15 Peebles, Transcript of Evidence, p. 838

16 Mahoney, Transcript of Evidence, p. 628

transported. The volume and level of radioactivity of the waste need to be considered because of the additional precautions required to ensure that the packaging could withstand a plane crash.

Suggestions

5.16 The Western Australian Chamber of Mines and Energy attributes the lack of transport incidents in the mineral sands industry to the use of long term contracts with a particular haulier whose drivers are trained on the occupational hazards involved.[17]

5.17 During the Inquiry it was suggested that local authorities should be advised and contingency plans established for each area.[18] For example, when concentrated uranium ore (yellow cake) from Roxby Downs transits Port Augusta, police control the traffic on the bridge through the main thoroughfare. It was also suggested that more training is needed for fire services and State Emergency Services, whose members are not always fully trained and equipped to handle radioactive spillages en route.[19] The concern is that training in these services is limited to cleaning up the material, and inadequate attention may be given effects on the health of emergency workers.

5.18 Suggestions included:

- a team of trained and well-equipped people could accompany the radioactive material so that an accident could be dealt with immediately;[20]
- waste disposal companies which have safety and spill equipment and training response and escort vehicles for other classes of dangerous goods, could also deal with radioactive substances;[21]
- a police, army or suitable guard escort should accompany the transportation of radioactive waste;[22] and
- radioactive waste transport vehicles should travel in convoys, as drivers would be better able to maintain a safe area whereas single units do not have that capacity.

---

17 Schache, Transcript of Evidence, p. 284

18 District Council of Paringa, Submission No. 6, p. 1

19 Pitt, Transcript of Evidence, p. 163

20 Ibid, p. 167

21 Wong, Transcript of Evidence, p. 743

22 District Council of Paringa, Submission No. 6, p. 1; Pitt, Transcript of Evidence, p. 163

5.19 Rhone Poulenc proposes to include a Global Positioning System satellite tracking system for vehicles transporting radioactive waste from its proposed Pinjarra rare earth processing plant to the Mt Walton repository. This will enable the identification of and communication with vehicles in the case of an accident.[23]

5.20 It is inevitable that from time to time radioactive waste will need to pass through areas which are environmentally sensitive or farming areas which have international markets in food, wine or ecotourism. Australia enjoys a reputation of being a clean food producing nation: Ms Lannstrom stressed that accidents in areas such as the Murray Darling River basin, the third largest river system in the world, could severely damage our international reputation and have vast economic consequences.[24] It was suggested that alternative routes around environmentally sensitive areas or cities could be used to transport this waste.[25] For example, the consignment of radioactive waste to the Esk storage facility, Queensland, took a longer route to by-pass the wall over the Wivenhoe Dam.[26]

Recommendation 11

The Committee recommends that the transportation of significant amounts of radioactive materials should require an assessment of the most appropriate transport mode.

5.21 Community consultation processes should be considered during the review of the transport guidelines and legislation.[27] It was suggested that an independent consultant should consider the details of any proposed movement of Commonwealth owned radioactive waste.[28] The Committee believes,

23 Newton, Transcript of Evidence, p. 701

24 Lannstrom, Transcript of Evidence, p. 190

25 Botten, Transcript of Evidence, p. 174-175

26 Mahoney, Transcript of Evidence, p. 627

27 City of Port Augusta, Submission No. 4, p. 4

28 Ibid, p. 4

however, that for most transport operations, authorities' concerns could be adequately dealt with by sufficient consultation with state and local governments.

Recommendation 12

The Committee recommends that State governments and local councils en route should be fully notified of the route and contents of radioactive waste consignments and should be given sufficient practical knowledge to be able to devise and implement contingency plans.

Conclusions

5.22 Where it is necessary to transport significant quantities of radioactive waste the full range of options should be considered including rail, sea and air transport provided the necessary safety precautions are taken in each case.

5.23 In weighing up a 'one central repository' scheme versus a 'several local repositories' scheme the desire to move waste away from populous areas must be weighed against the risks of transport. It was suggested that:

> there is a very significant risk in transporting large volumes of high level waste to a repository.[29]

5.24 It was suggested that it may be preferable to have several regional or local interim storage sites where waste could be retained until it has decayed to levels more acceptable for longer distance transport. This may present a lower risk than trying to move larger volumes of high or intermediate level radioactive waste.[30]

5.25 On balance the Committee does not believe that this approach is the most appropriate. Much of the higher level waste has a longer half life and this

29 Hanlon, Transcript of Evidence, p. 430

30 Ibid, p. 430

approach would increase the amount of handling. There are also the issues of security at a number of sites, and additional distances involved in moving the material to an interim regional storage facility and then moving it to a more permanent site. The Department of Transport also believes that distance is not a major concern, provided that the correct precautions are taken.[31]

5.26 The *Code of Practice for the Safe Transport of Radioactive Substances* is currently being revised and many concerns in relation to its readability and regulatory limits must be addressed in that process.

31 Makeham, Transcript of Evidence, p. 687