HEALTH COMMISSION OF NEW SOUTH WALES - RADIATION BRANCH

Position Paper presented by Mr A W Fleischmann APPENDIX 16 TO ANNEX E

The Radiation Branch is located in a set of scientific laboratories at Lidcombe, roughly 18 km west of the centre of Sydney. The staff consists of 5 scientific officers (3 physicists, 2 chemists); 3 technical officers (2 diagnostic radiographer inspectors, 1 industrial inspector); 2 film badge officers; 1 photographer (who serves the whole scientific complex); 1 electronic technician (who also serves the scientific complex). The branch is responsible for administering the Radioactive Substances Act No. 5, 1957.

While the Study title refers to the "Protection of the Australian Public ..." the branch, as its counterpart in other States, is established to enforce a State Act and as a consequence planning has always been State oriented. The branch has also considered reacting to essentially civil emergencies and has not made any plans relating to radiation situations resulting from a state of war.

The planning in which the branch has been involved has been directed towards:

a. possible radiation accidents resulting from medical, scientific or industrial uses of radiation, which also includes the transport of radioactive substances:

b. possible radiation accidents at the Australian Atomic Energy Commission (AAEC), Lucas Heights which may have "off site" consequences (the APTCARE plan);

c. planning for possible visits by nuclear powered warships.

General Emergency Plan

The branch has arranged for the police and fire brigade to be issued with a list of telephone numbers where branch staff members may be contacted. As well the officer-in-charge carries a "bleeper" whereby he may be contacted on a 24 hour basis. The result is that it should be possible, by following a simple set of instructions, to contact at least one branch officer. A copy of the emergency contact list is attached.

As well two branch officers always carry some equipment in their cars which allows them to react directly to an accident without having to call at the laboratory. This equipment includes monitors, tongs, plastic bags, overalls, overshoes, lead pots, etc.

For more distant locations the Police Rescue Organisation has indicated that it is prepared to make

helicopter transport available.

The plan is also incorporated in the Sydney Metropolitan Area Disaster plan.

Aptcare (A Plan to Cope with Accident at the Research Establishment of the Australian Atomic Energy Commission, Lucas Heights, NSW)

This plan draws together a number of services operating within New South Wales. Essentially the branch will "... liaise with the AAEC in the implementation of radiological protection measures deemed necessary to safeguard the health of the general public and of the emergency teams ...". Towards this end the branch is prepared to take part in monitoring operations, to decide on the need for iodine prophylaxis, and to make its laboratory facilities available. The branch has a stock of roughly 50,000 potassium iodate tablets should the need arise. These tablets are in packets marked with prescription amounts.

Nuclear Powered Ships

In recent years no nuclear powered ships have visited New South Wales but a number of years ago the branch, in conjunction with a number of other State instrumentalities, considered the possibility of such visits and possible actions that could be taken should an accident, involving a reactor, occur.

If, in the near future, it is decided that such ships should visit NSW ports a monitoring program and an emergency action program would need to be developed.

Other Considerations

In 1981 the Commonwealth Government considered agreeing to the IAEA "Proposal for an International Convention on Nuclear Safety Co-operation and Mutual Emergency Assistance in connection with Nuclear Accidents". This convention places Australia under certain obligations if neighbouring nations are involved in a nuclear accident. It would seem that under proposed variations of the Atomic Energy Act the States could also be called on to provide assistance under this convention.

In the above notes no reference has been made to nuclear wars. The branch is simply not able to predict how it could react to this type of situation. With a staff of 8 technical people located close to the centre of Sydney and only a limited supply of instrumentation it is difficult to envisage the branch serving a useful purpose in such a major event. It should further be noted that the branch has relatively little instrumentation or equipment appropriate for major nuclear disasters.

As an example when, a number of years ago, a person contaminated himself, his wife, his home and his dog with Sr-90 it took four officers of the branch, working continuously, nearly 3 months to carry out the decontamination, and this was with the assistance of two AAEC officers plus a considerable amount of AAEC equipment. All this for one home contaminated by a few millicuries of Sr-90 - hardly to be compared with the effects of a 1 MT bomb.

COMMONWEALTH DEPARTMENT OF HEALTH

APPENDIX 17
TO ANNEX E

Position Paper presented by Drs W A Langsford & D B Travers

Australian Radiation Laboratory

The Laboratory has a fundamental role, as part of the Department, relating to occupational and public exposure to ionising radiation, radioactive materials, microwaves, lasers and ultraviolet radiation. This role requires considerable emphasis on research, development and scientific advisory services in these areas, so that hazards arising from such exposures can be properly evaluated and acted upon when necessary. The research is mostly in radiation physics and chemistry on topics related to radiation health.

Surveillance of radiation exposure is carried out by the Laboratory by several means. These include a personal monitoring service for radiation workers; environmental monitoring programs to evaluate fall-out and natural background radiation; special monitors such as the whole body monitor for monitoring individuals; evaluation of consumer products and the use of different irradiating equipments. The Laboratory also maintains national radiation standards, against which various instruments can be compared and facilities for determining compliance of radio-pharmaceuticals and other radioactive materials against standards. It acts as the focal point of national expert advice in radiation health matters as a consequence of its activities in these areas.

In addition to the above, the Laboratory prepares for national application through bodies such as the National Health and Medical Research Council and various Commonwealth/State Committees, radiation protection standards and codes of safe practice for the various uses of radiation sources. These standards and codes can then be used by the States and Territories in their implementation of legislation relating to the control of radiation sources.

National Disaster Relief (Health) Committee

The Public Health Division of the Commonwealth Department of Health acts as the co-ordinator of Commonwealth disaster relief resources in the 'health' field. There are three Commonwealth agencies which can provide health relief - Defence (Medical area), Health and Veterans' Affairs. In order to plan how Commonwealth aid can be provided in the most effective manner, the Department of Health has established a series of committees.

Under plans for responsibility in times of national emergency, the Commonwealth Director-General of Health is responsible for ensuring that a proper balance between defence and civilian needs is maintained in the use of medical personnel and facilities. After the 1939-45 War, provision was made for the Department to examine and report on the position and

to advise the Minister for Health of any action necessary to maintain the health services to the whole community. Since 1950 the Department has serviced three important Committees:

Central Medical Planning Committee -
replaced in 1966 by:
National Medical War Planning Committee -
replaced in 1977 by:
National Disaster Relief (Health) Committee.

The National Disaster Relief (Health) Committee is assisted by a Panel of Consultants representing all aspects of Health resources. The members of this panel would be required to provide expert advice on a particular field of health service. The Committee does not meet under normal peacetime circumstances unless the strategic situation indicates that there is a foreseeable threat.

However, the undermentioned supporting Committees and Working Parties of the National Committee meet regularly to consider relief measures which may be necessary to meet emergency situations which result from natural disasters:

Steering Committee on Disaster Relief (Health)
Materiel and Facilities Working Party
Manpower Resources Working Party
Commonwealth Disaster Relief (Health) Committee
in each State.

AUSTRALIAN CAPITAL TERRITORY

Position Paper

During emergencies or disasters involving radiation accidents, the ACT Emergency Service would only become involved in a backup role to the professional emergency service organisations in the provision of vehicles, equipment and personnel.

For a war, or threat of war situation, it has been mutually agreed between the Capital Territory Health Commission and the ACT Emergency Service, that the latter service would be responsible for radiation monitoring in the event of nuclear attack. The ACTES is dependent upon the Natural Disasters Organisation for training in radiation monitoring. No such training has been available for several years.

Capital Territory Health Commission

It is the responsibility of the Capital Territory Health Commission to provide an immediate response, in an advisory role, to any incident involving release of radioactive material. This advise will include measures to prevent spread of contamination to individuals or the environment and minimisation of exposure of counter-disaster personnel while carrying out their duties.

Procedures have been developed by the Commission for implementation following any unplanned release of radioactive materials currently in use in the ACT; all users of such materials and the emergency services in the ACT have been advised of these procedures.

Appropriately qualified Commission Officers located at each of the Commission's Hospitals have been appointed as Radiation Safety Officers, to be alerted immediately there has been release, or suspected release of radioactive materials. Each officer either carries, or has access to, an emergency decontamination kit. Kits are retained within the Nuclear Medicine Department of each Hospital.

Advisers are available also from agencies and organisations such as the Australian National University, CSIRO and the National Biological Standards Laboratory.

Guidelines have been developed for use by personnel involved in a radiation emergency prior to the arrival of an adviser. Specific guidelines for persons exposed to iodine 125 have been formulated and information has been prepared on the availability and location of storage facilities for radioactive materials in the ACT.

NORTHERN TERRITORY EMERGENCY SERVICE

APPENDIX 19
TO ANNEX E

Position Paper presented by Mr A J Beer

Introduction

The Northern Territory Emergency Service is a statutory authority established under the Northern Territory Disasters Act. This Act establishes the authority for the counter-disaster organisation which consists of the Counter-Disaster Council together with regional and local elements. Furthermore, it provides for the declaration of a State of Emergency and a State of Disaster.

General Responsibilities of the Service

The Northern Territory Emergency Service provides the administrative and operational infrastructure to the counter-disaster organisation and has responsibility for the following:

a. Counter-Disaster Planning. Responsible for the preparation and revision of counter-disaster plans for the Territory and for advice to government instrumentalities and the community on counter-disaster measures and procedures.

b. Counter-Disaster Training. Responsible for the training and education of specialist groups and the community in counter-disaster procedures and the establishment and maintenance of training facilities.

c. Counter-Disaster Support. The Director is required to provide whatever assistance is necessary during counter-disaster (including civil defence) operations by way of material, manpower and finance, including that support which originates from interstate or from the Commonwealth. He is also responsible for the co-ordination of government support programs for emergency services, including the Commonwealth equipment and training programs.

Responsibilities on Matters relating to the Protection of the Public from Ionising Radiation

With regard to this specialist aspect the Service has the following responsibilities:

a. The production of plans related to radiation protection.

215.

b. The development of a radiation monitoring system for application during civil defence operations.

c. The provision of specialist training related to the effects of, and protection from, ionising radiation.

d. The provision of radiation monitoring equipment.

The Service has the capability of undertaking all of the above responsibilities.

APPENDIX 20
TO ANNEX E

PROCEDURES FOR VISITS BY NUCLEAR POWERED WARSHIPS TO AUSTRALIAN PORTS

Address by Commander J W Firth MBE, RAN,
Secretary, Visiting Ships Panel (Nuclear)

The considerations applied to visits by nuclear powered warships to Australia are contained in the Department of Defence publication, "Visits by Nuclear Powered Warships to Australian Ports - Procedures - OPSMAN 1". Adherence to these procedures is monitored by the Visiting Ships Panel (Nuclear), (VSP(N)), which is a Commonwealth interdepartmental standing committee, established to consider specific arrangements for visits by nuclear powered warships (NPWs) to Australian Ports.

Composition of the Panel. The VSP(N) is normally chaired by the Director General, Joint Plans and Operations, a uniformed officer of Brigadier or equivalent rank. The secretary is a nominated officer of the Joint Military Operations and Plans Division of the Department of Defence and other members represent:

a. Strategic and International Policy (SIP) Division, Department of Defence;

b. Defence Science and Technology Organisation;

c. The Director of Naval Operations;

d. Natural Disasters Organisation;

e. Australian Atomic Energy Commission (AAEC);

f. Department of Home Affairs and Environment (HA & E); and

g. Department of Health (Health).

Representatives from other Commonwealth departments (eg Prime Minister and Cabinet, Foreign Affairs, Administrative Services) may be invited to attend VSP(N) meetings, depending on the nature of the business.

NPW Visit Clearance Procedures. Initially, the relevant diplomatic mission seeks the approval of the Commonwealth Government via the Department of Foreign Affairs. The request is considered by the VSP(N) and a recommendation concerning the visit is forwarded by SIP Division to the Minister for Defence. If the Minister approves the visit request, Foreign Affairs advises the diplomatic mission. The host State Government is advised by the Department of Prime Minister and Cabinet.

VSP(N) Considerations. Apart from the general administrative and security aspects of the visit the VSP(N) considers various factors peculiar to NPW visits prior to any recommendation being forwarded:

a. the availability of a suitable berth;

b. the availability of an appropriate port safety organisation and AAEC monitoring teams;

c. any other matters considered relevant by AAEC, HA & E and Health, specifically the Australian Radiation Laboratory (ARL).

Berth Requirements. In 1976, the Federal Government commissioned a study entitled "Environmental Consideration of Visits of Nuclear Powered Warships to Australia." This study was undertaken by the Department of Defence and the AAEC, and subjected to independent examination by the Australian Ionising Radiation Advisory Council. No berth or anchorage is considered for use by an NPW unless it has been examined against the criteria set out in this study and consequently assessed as suitable. The VSP(N) has the responsibility for ensuring that these assessments are conducted in accordance with the specified criteria.

Port Safety Organisations. Appropriate State authorities are responsible for the establishment and maintenance of a safety organisation for those berths under State control. The VSP(N) provides advice during the formative stages and maintains liaison with established safety organisations. The State organisation has close links with local Royal Australian Navy (RAN) authorities. In the case of the NPW using a Commonwealth, ie Navy, berth, the Naval Nuclear Ship Safety Organisation will co-ordinate the safety plan in co-operation with relevant State authorities.

Radiation and Radio Activity Monitoring. Radiation monitoring is conducted by the AAEC, assisted by the ARL, RAN and State authorities. Monitoring during each visit is normally confined to a once-daily manual survey of those areas having public access, complemented by continuous monitoring using fixed, remotely operated detectors to provide early warning of significant accidental releases. Samples of bottom sediment and shellfish are collected from the vicinity of the berth before and after each NPW visit and checked for fission products. Further samples are checked 3 months later in the case of a single visit. When visits are frequent, samples are checked on a regular 3 months basis. Thermo-luminescent dosimeters are positioned at selected sites during each visit and subsequently assessed. Finally, an Emergency Radiation Monitoring Group (EMRG) is held on standby throughout each visit, in case an accident should occur.

General Safety Procedures. The following routine safety procedures are established during each NPW visit:

a. a continuous communication link (telephone or radio) is maintained between the NPW and RAN personnel;

b. the port safety organisation maintains a continuous telephone link with the RAN;

c. routine radiation monitoring is conducted;

d. a designated officer is positioned as OIC Zone 1, the immediate vicinity of the NPW, and is responsible for evacuation of this area should it become necessary;

e. a police or naval guard boat is available for patrol duties and assistance to the monitoring team; and

f. the RAN obtains, at regular intervals, meteorological information for use, if required. by the Emergency Control Centre.

Emergency Procedures. An Emergency Control Centre is established for the duration of the visit and is responsible for controlling any emergency response. Depending on the magnitude of an accident, measures taken could include:

a. activation of the EMRG;

b. evacuation of Zone 1;

c. removal of the vessel to a previously designated remote anchorage;

d. other actions as may be dictated by the prevailing circumstances.

4. (continued)

h. hostile acts involving the use of nuclear weapons.

(For the purpose of the present Study, it was agreed that consideration should be limited to those occurrences which might give rise to major ionising radiation situations.)

5. Response capability:

a. In general, syndicates recognised that response capabilities were required to cope with:

(1) normal monitoring eg. monitoring for environmental, medical, mining and industrial uses;

(2) special events eg. accidents to reactors or nuclear ships, and acts of terrorism, and

(3) nuclear war.

b. Response capability, related to the probable or actual severity of a particular event, would be required:

(1) at source eg. facilities such as power or enrichment plants, ships, etc;

(2) at State/Territory level, which could include regional level where appropriate; and

(3) at Commonwealth level.

6. Establishing a measurement and assessment capability. Factors relevant to establishing an adequate capability include:

a. the type and probability of the event;

b. the level of response required and types of instrumentation needed;

c. the location of the event;

d. the consequences to affected communities; and

e. the organisation, including training, needed.

7. General requirements for the capability. The general requirements for an adequate response capability include:

a. identification of the hazard, to include appropriate warning, monitoring and reporting systems;

b. measurement and evaluation, to include in-place monitoring, aerial and ground survey, individual dose measurement, etc;

c. establishment of a plan of action, to include organisation and equipment appropriate to task;

d. training and exercising to ensure the plan is

7. d. (continued)

practical; and

e. public education and information.

DISCUSSION EXERCISE 2

Aim

8. To examine in more detail how the requirements for the protection of the Australian public from the effects of ionising radiation should be met, in times of peace or in the event of an act of terrorism.

Summary of syndicate findings

9. Current roles and responsibilities:

a. It was recognised that, in the range of possible situations addressed, the general division of roles and responsibilities between the States (including the Northern Territory) and the Commonwealth was as follows:

(1) the primary responsibility for control of such situations, including responsibility for the protection of the public from ionising radiation, rests with the States. This responsibility includes planning for such situations, with appropriate arrangements for organisation, co-ordination, information-processing, manpower and equipment; training to and exercising such plans; the implementation of such plans as required; and, associated public education and information aspects; and

(2) the Commonwealth's role is primarily that of support to the States in assisting them to control such situations. This support is envisaged to include the provision of information, advice, technical and logistic assistance, and can extend to co-ordination in specific instances: for instance, where support is required for more than one affected State, or under agreed co-ordination arrangements such as the National Anti-Terrorist Plan. The Commonwealth also has specific responsibilities under international agreements, and for national codes and standards.

b. It was agreed that in all instances the State Department of Health (or its equivalent) would be the combat authority, and would thus have the primary responsibility for planning and

9. b. (continued)

control, under co-ordinating arrangements determined in State counter-disaster legislation or plans. The role of the Commonwealth Department of Health would be analogous to the role of the Commonwealth Department of Primary Industry (Bureau of Animal Health) in relation to the combating of exotic animal diseases.

c. There was recognition of a need for further examination and formalisation of respective Commonwealth/State roles and responsibilities in relation to such situations.

10. Possible deficiencies. There were indications of possible deficiencies in current arrangements in the following areas:

a. Policy and planning. Some members of the Study felt that policy guidance should be further developed for war-related planning in relation to some peace time emergencies. For instance, some members were of the view that the absence of a national manpower policy for war-related planning led to uncertainties in contingency planning. In this regard, attention was drawn to the existence of the Canadian EPC 'Space Objects Contingency Plan' (EPC 18/80) and further consideration was invited to the development of similar plans at Commonwealth and State level.

b. Measurement and assessment capability. The need for an extension of existing capabilities in the measurement of ionising radiation, and possibly also in the evaluation of such measurement, was recognised. It was considered that this needed further examination, to include manpower and equipment implications.

c. The Commonwealth's support capability. Further examination and improvement of the Commonwealth's capability to support the States in the rapid and effective measurement and assessment of major ionising radiation situations was recommended.

11. Role of emergency services personnel. The role of State/Territory emergency services organisations and personnel

11. (continued)

(both professional and volunteer) was seen as primarily one of support, including logistic support. However, a role was seen for such organisations in extending the measurement capability required in major ionising radiation situations, and it was considered that State plans should address the employment of such resources. There would, of course, be training and equipment implications in such considerations.

12. Warning and activation

a. The role of Commonwealth agencies, including NDO, in providing warning and information on possible situations involving ionising radiation release was recognised, and it was considered that existing machinery, including provision for interdepartmental assessments, was appropriate in situations where the Commonwealth had such a responsibility.

b. It was recognised that the need for warning and activation systems, and related public education and information provisions, should be addressed in State/Territory planning.

13. Capabilities

a. Some doubt was expressed as to the adequacy of existing capabilities for the timely measurement and assessment of ionising radiation hazards. (See also paragraph 10.b. above). It was considered that further study was required of the whole area of information acquisition and processing in relation to major ionising radiation situations, to include the collection, collation and dissemination of relevant information.

b. Further examination was also considered necessary of Commonwealth capabilities in support of the States in such situations (see also paragraph 10.c. above). This examination should include:

(1) the Commonwealth's ability to deploy expert teams (similar to the US 'NEST' provisions) - although it was recognised that some precedents already existed: for example, in support of visiting nuclear ships' visits, and

(2) international and bilateral provisions to obtain resource support and assistance.

c. It was recognised that Australia was dependent to a considerable extent on overseas sources for equipment and arrangements for equipment maintenance and, in view of the possibility

13. c. (continued)

that such sources and arrangements could be disrupted, it was felt that consideration should be given to the development of some local industrial capability in these areas.

d. The role and capabilities of universities and other tertiary and research establishments in providing assistance and resource support was recommended for further examination.

e. In general, it was recognised that effort needed to be devoted to the development of inventories of manpower and equipment resources of relevance, and to standardisation of equipment and techniques where possible.

DISCUSSION EXERCISE 3

Aim

14. To examine in more detail how the requirements for the protection of the Australian public from the effects of ionising radiation should be met, in the event of nuclear attack.

Summary of syndicate findings

15. Roles and responsibilities

a. While there was general recognition that the respective roles and responsibilities of the Commonwealth and State/Territory authorities in respect of protection of the public from the effects of ionising radiation, as already defined in Discussion Exercise 2 (paragraph 9 above), should still apply in the situation under discussion, it was also recognised that some new factors required consideration. These included:

(1) the need to ensure continuity of administration in the post-attack period;

(2) the potentially greater scale of effects, together with a wider geographic distribution;

(3) limitations which might be placed on the availability and survivability of resources (including manpower); and

(4) the broader international and strategic context within which both the situation and the response needed to be seen.

b. There was recognition, therefore, that a lead role in the response (including warning,

15. b. (continued)

activation and public information) would need to be taken by government at the highest level, with all appropriate strategic and defence input.

16. Possible deficiencies

a. A number of possible deficiencies in the framework within which a response would need to be undertaken were identified, including:

(1) the lack of specific civil defence plans;

(2) differences in State/Territory legislation with bearing on the response, including the facts that:

(a) some States do not have legislation with specific reference to civil defence response, and

(b) counter-disaster organisations in some States do not have a designated civil defence role;

(3) the need to define relative Commonwealth/State responsibilities, and responsibilities within the respective Commonwealth and State/Territory structures, for such matters as command and control in such situations, military/civil arrangements, and manpower policies;

(4) the need to provide more detailed strategic assessments and scenarios as a basis for planning coordination between the Commonwealth and the States/Territories and to indicate appropriate levels of planning and preparation related to levels of threat, and

(5) the need for clear definition of acceptable standards of risk from ionising radiation in such circumstances for the population at large and for response personnel.

b. Specific deficiencies in existing response capabilities were identified in such areas as:

(1) warning systems;

(2) monitoring and assessment systems (including the shortage of modern and reliable instrumentation);

(3) communications systems (particularly 'hardened' systems which would provide some assured communications capability between response authorities and with affected communities);

16. b. (continued)

(4) resource identification systems;
(5) prepared public education and information programs; and
(6) national manpower policy and planning.

17. Role of emergency services personnel. As in earlier considerations, it was recognised that emergency services organisations and personnel would, in the area of radiological measurement and assessment, have largely support roles, but considerable discussion ensued on the extent to which such organisations and personnel might be required to provide direct supplementation to existing measurement capabilities, and even to some extent in the area of assessment. Note was taken of the Tasmanian provision for the State Emergency Service organisation to be responsible, in the civil defence setting, for the operation of monitoring and prediction services on behalf of the State Department of Health.

18. Warning and activation

a. The need for warning and activation systems and related public education and information provisions to be addressed in civil defence planning at all levels was recognised. Current deficiencies in these areas were acknowledged (see also paragraph 12 above).

b. Specific attention was drawn to the need for multi-lingual material in public education and information programs.

19. Capabilities

a. A range of required capabilities was identified, although it was recognised that the scope and extent to which such capabilities would be required to be developed depended upon strategic assessments on a periodic basis. These capabilities included:

(1) a trained and equipped monitoring organisation;

(2) an observation and reporting system;

(3) a 'hardened' communications capability;

(4) a public warning system (to include public education and information provisions);

(5) an appropriate 'mix' of shelter and evacuation programs; and

(6) provisions for appropriate inputs from relevant agencies, including the Bureau of Meteorology.

b. The extensive training and equipment implications of the development of such capabilities were recognised.

Special considerations

20. Specific-to-area needs. In addition to its consideration of the general topic for this Discussion Exercise, within the general guidelines offered, each syndicate was asked to consider the possible needs of designated areas (eg, capital city business/industrial and 'dormitory' areas, the national capital, major provincial cities and rural areas). Without specific scenarios (for which a need was felt), it proved possible only to generalise about such needs, but the considerations did tend to support the summary of syndicate findings in paragraphs 15 through 19 above.

21. The 'Radiation Response' Model. In an attempt to develop a coherent view of radiation response requirements across the broad range of situations considered during the Study, a diagram purporting to establish a continuum of radiation response requirements was tabled and discussed in plenary session. While it is recognised that the diagram is perhaps an over-simplification, and it is not without its contentious aspects, it was considered a useful visualisation and is accordingly included at Appendix 1.

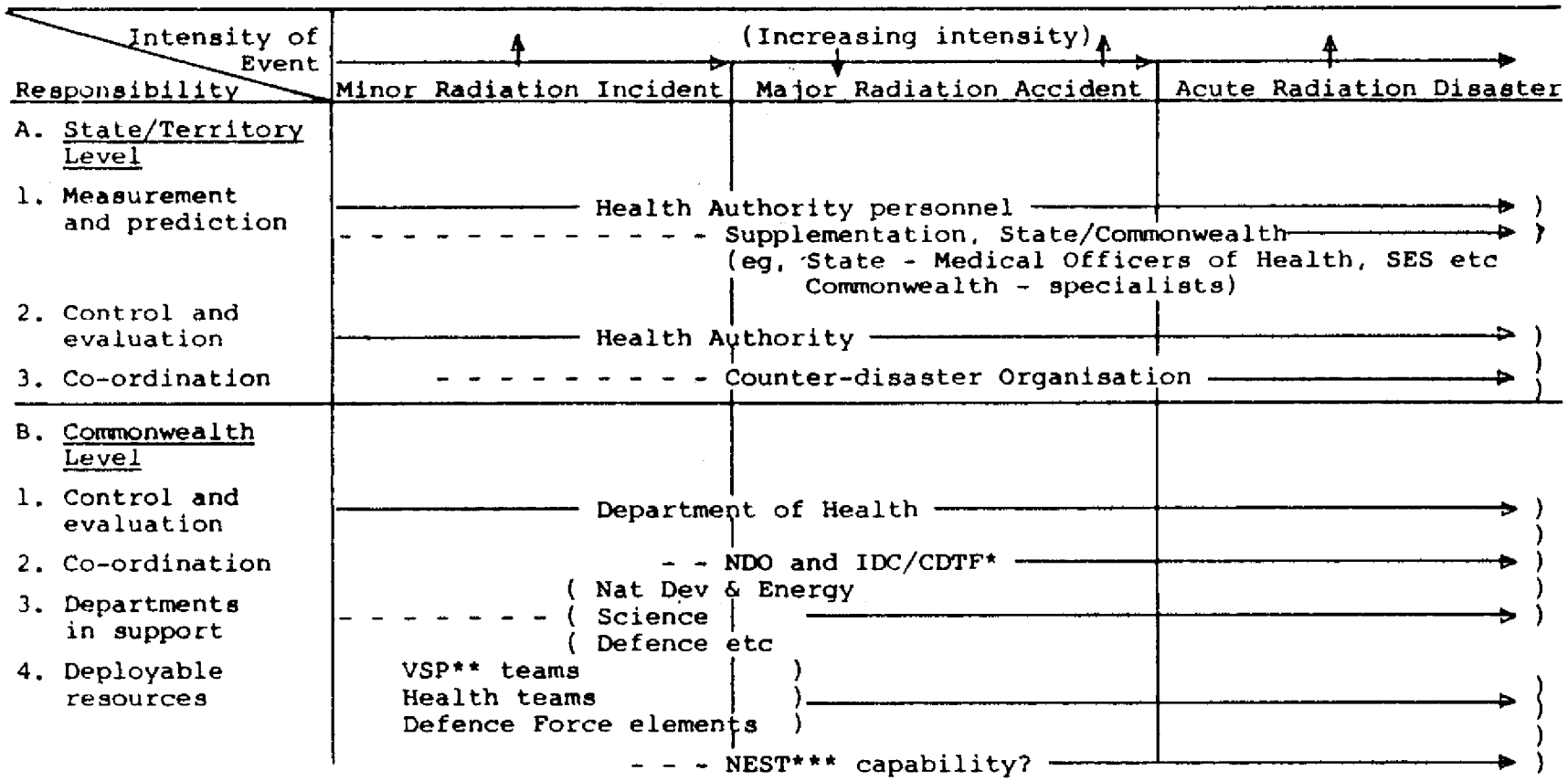
22. Paper: 'Limiting Damage from Nuclear Attack'. In attempting to qualify and quantify the likely ionising radiation problems which could result from hostile activity employing nuclear weapons, participants found a paper entitled 'Limiting Damage from Nuclear Attack', presented by Dr Desmond Ball at the 1982 ANU Conference on Civil Defence and Australia's Security, to be most useful. Participants requested that this paper should be included in the Report of Proceedings, and Dr Ball agreed to this. The paper is at Appendix 2; full acknowledgement is given to Dr Ball and to the ANU Research School of Pacific Studies (Strategic and Defence Studies Centre). Its publication in this Report is not, however, to be taken as indicating or implying Department of Defence agreement with or acceptance of its contents.

Appendices:

1. The 'Radiation Response Continuum' - A Visualisation.

2. Dr Desmond Ball, 'Limiting Damage from Nuclear Attack', a paper presented to the 1982 ANU Conference on Civil Defence and Australia's Security (with acknowledgements to the author).

(A possible model for planning response in ionising radiation emergencies)



* Interdepartmental Committee/Counter Disaster Task Force

** Visiting Ships Panel

*** Nuclear Emergency Survey Team (US)