

NUCLEAR SAFETY BUREAU

Annual Report 1996–97

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Date

**The Hon Trish Worth MP
Parliamentary Secretary to the Minister
for Health and Family Services
Parliament House
CANBERRA ACT 2600**

cc The Hon Dr Michael Wooldridge MP
Minister for Health and Family Services
Parliament House
CANBERRA ACT 2600

Dear Ms Worth,

In Accordance with Section 63M of the *Audit Act 1901*, I present the Annual Report of the Nuclear Safety Bureau for the period 1 July 1996 to 30 June 1997.

Financial accounts for the year ending 30 June 1997 together with a report by the Auditor-General, as required by legislation, are included in the Annual Report.

Yours sincerely,

D I Macnab
Acting Director

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OVERVIEW BY THE ACTING DIRECTOR

Throughout the year the Nuclear Safety Bureau (NSB) continued its regulatory approach to monitor and review the safety of nuclear plant operated by the Australian Nuclear Science and Technology Organisation (ANSTO). This included an ongoing regime of safety audits against the authorised arrangements in ANSTO's safety documentation and the bureau's expectations for nuclear plant drawn from international best practice. The NSB invited the participation of officers of the Australian Radiation Laboratory in these audits.



Don Macnab, Acting Director

Aspects of ANSTO's operation of nuclear plant reviewed by the NSB included training and accreditation of operations staff, abnormal occurrences, modifications to plant and emergency arrangements and exercises for the Lucas Heights Science and Technology Centre. Audits of HIFAR¹ were also conducted on operating logs, radiation protection and radioactive discharges. Based on the reviews and audits conducted by the NSB, and ANSTO's actions in responding to the bureau's requests and requirements for actions, the NSB concluded that ANSTO's nuclear plant operated safely throughout the year, and that risks to on-site personnel and the public were maintained at acceptably low levels.

ANSTO worked to upgrade safety documentation for HIFAR, with priority being given to quality assurance, design information, the safety case and operational safety limits and conditions. During the year, the HIFAR Quality System was certified to the Standard AS/NZS ISO 9001:1994. This is a significant achievement for HIFAR management and staff which provides a substantial contribution to the safety documentation for the reactor and an enhancement of the safety of operations.

The Moata research reactor will be the first such facility to be decommissioned in Australia. The NSB formally issued its Authorisation Requirement for the decommissioning, to ensure that radiation doses received by ANSTO employees and the public are kept within authorised limits and as low as reasonably achievable. To meet this requirement, ANSTO will provide arrangements for bureau agreement addressing the minimisation, treatment, safe storage and disposal of radioactive wastes arising during the decommissioning and dismantling of the reactor.

International recommendations and practice in radiation protection are based on the precautionary principle which assumes that all radiation exposures to humans carry some risk of harmful effects. Accordingly, the requirement to keep exposures as low as reasonably achievable (ALARA) is central to radiation protection philosophy. During the year, ANSTO made a significant commitment to meeting this objective by issuing a Safety Directive setting a policy and procedure for ensuring that radiation exposures arising from its operations are as low as

¹ HIFAR is an acronym for the **HI**gh **F**lux **A**ustralian **R**eactor.

OVERVIEW BY THE ACTING DIRECTOR

reasonably achievable. The NSB considers that the policy is consistent with best practice, and would recommend the adoption of similar policies by other organisations.

An NSB audit at HIFAR confirmed that radiation doses to staff were well below the dose limits for radiation workers recommended by the Australian National Health and Medical Research Council (NHMRC). Radiation protection at HIFAR is generally satisfactory, and measures are being taken to keep radiation doses as low as reasonably achievable. Adoption of ANSTO's ALARA policy will formalise these processes.

In addition to routinely reviewing the amounts of radioactivity discharged from HIFAR to the environment, the bureau conducted an audit of associated arrangements and equipment. Radiation doses to the public arising from the discharges were well within the annual limits recommended by the NHMRC. In fact, assessed maximum doses to the public from HIFAR discharges were close to the objective of ANSTO's ALARA policy, which is 2 per cent of the recommended limit. Below this level it is not considered necessary to demonstrate that the doses are as low as reasonably achievable. Nevertheless, work is continuing at HIFAR to further reduce the amount of radioactive discharges from the reactor, and to correct deficiencies and make improvements to the arrangements recommended in the NSB audit.

The NSB completed a review of international recommendations and practices for the regulation of airborne radioactive discharges, and invited comments from other Australian agencies and the public on a proposed method for establishing an authorisation for airborne radioactive discharges from HIFAR. Subsequently, an airborne discharge authorisation for HIFAR was drafted, based on the requirement that radioactive discharges, and consequent doses, should be as low as reasonably achievable. The authorisation will require the bureau to be notified if the discharges exceed specified monthly, quarterly or annual levels. This will establish external regulation of discharges from HIFAR, in line with best practice, from the first quarter of the new financial year.

The probabilistic safety assessment of HIFAR, being conducted for the Department of Industry, Science and Tourism by a specialist United States company, is nearing completion. The NSB considers the study to be comprehensive, with detailed and clear event sequence diagrams and dependence matrices that give good insight to possible system interactions. An International Atomic Energy Agency (IAEA) peer-review team, including experts from Germany, the United Kingdom and Sweden, visited Australia and undertook an independent review of the probabilistic safety assessment. The company is working to address the various review comments, and to prepare a final report.

The IAEA Regulations for the Safe Transport of Radioactive Material are widely adopted throughout the world, including in Australia where they are incorporated into a code of practice. A new edition of the IAEA regulations was published in the latter part of 1996 to reflect revised radiation dose limits recommended by the International Commission on Radiological Protection, exemption levels consistent with the International Basic Safety Standards and the need for radiation protection programs. An NSB officer is the invited Australian member of the committee that developed the revised regulations. These regulations are expected to be fully implemented

OVERVIEW BY THE ACTING DIRECTOR

world-wide by 2001, and the Australian code of practice will need to be revised by then. The NSB and the Australian Radiation Laboratory were nominated as joint competent authorities, from 1 July 1997, to provide a means for the assessment of the land transport of the Commonwealth's radioactive materials.

Nuclear safety was promoted internationally by the entry into force of the Convention on Nuclear Safety in 1996. Under the convention, the safety of nuclear power plants is placed under the scrutiny of an international peer review process. The first such review is to take place in 1999. Under the obligations of the convention, all practicable improvements to safety of a power plant must be made where required, or the plant shut down as soon as practicable. Also, emergency arrangements must be put in place to deal with the trans-boundary effects of an accident at a power plant. Australia ratified the convention and the NSB carries the primary responsibility for Australia's obligations under the convention.

The Hon Trish Worth, Parliamentary Secretary to the Minister for Health and Family Services, has announced the Government's intention to pass legislation establishing the Australian Radiation Protection and Nuclear Safety Agency by 1 July 1998. Under the legislation, for the first time, all Commonwealth radiation and nuclear activities will come under the scrutiny of an independent regulatory agency. The new agency will be empowered to set and enforce compliance with standards, audit operations and impose penalties for significant deficiencies. Another core function of the agency will be to promote uniform regulation of radiation practices across State, Territory and Commonwealth jurisdictions.

All ANSTO nuclear and radiation facilities will be regulated by the new agency, at arms length, in line with international best practice, thus overcoming current differences in the agreed scope of nuclear plant within the NSB's responsibilities. This will include regulation of spent fuel and waste management facilities, the construction of the recently announced replacement for the HIFAR research reactor and the decommissioning of the existing reactors at Lucas Heights. A high priority for the NSB during the coming year will be the development of safety assessment principles, expectations and guidelines for the staged approval of siting, design, construction and operation of the replacement reactor. These will be based on the broad international consensus on nuclear safety developed in the IAEA safety fundamentals, standards and guidelines, and international best practice. An environmental impact statement and a comprehensive safety analysis report will be developed by ANSTO, to substantiate the suitability of the site and safety of the replacement reactor.

I believe that the considerable experience and expertise of the Nuclear Safety Bureau and the Australian Radiation Laboratory, combined to form the new agency, will create a centre of excellence for regulation, advice, research and services supporting nuclear safety and radiation protection of employees, the public and the environment. Preparation for the establishment of the agency during the coming year will be a major task for both organisations. I am optimistic that the agency, in consultation with State and other Australian authorities, Commonwealth users of radiation and the public, will develop and promote regulatory requirements which match international best practice and meet community expectations.

CORPORATE OVERVIEW

LEGISLATION

The NSB is established as an independent corporate body by Part VIIA - Nuclear Safety Bureau, *Australian Nuclear Science and Technology Organisation Amendment Act 1992*, legislation which amended the *Australian Nuclear Science and Technology Organisation Act 1987*. Responsibility for the administration of Part VIIA of the Act rests with the Minister for Health and Family Services. The bureau reports to the Parliamentary Secretary of the Minister through the Therapeutic Goods Administration. The Director, Nuclear Safety Bureau, retired at the end of 1995 and an Acting Director was appointed by the Minister.

CORPORATE OBJECTIVES

- Protect individuals, society and the environment in accordance with international best practice, by routinely and systematically monitoring and reviewing the safety of nuclear plant² operated by the Australian Nuclear Science and Technology Organisation (ANSTO).
- Provide technical advice to the Commonwealth, based on international best practice, on the safety and regulation of nuclear facilities, including safety assessments for visits to Australia by nuclear powered warships.
- Ensure consistency between Australian nuclear safety policies and practices and the programs and publications of international nuclear safety organisations.
- Maintain adequacy of Australian regulations for the safe transport of radioactive substances.

SOCIAL OBLIGATION

The NSB recognises its responsibility to consider the expectations of the Australian public in developing its policies and requirements for the safety of nuclear facilities, and is cognisant of the concerns of members of the local community on safety issues at ANSTO. The bureau attempts to keep the public informed of its work, and encourages comment on matters of public interest. In this way, NSB safety policy and requirements can address public perceptions and concerns, as well as international best practice for the regulation of nuclear safety and radiation protection.

PUBLIC INFORMATION

During the year, the NSB responded to many requests for information from individual members of the public, community groups and the media. Advice, information and reports on current

² Nuclear plant in this context refers to nuclear research reactors and associated plant, and other plant where self-sustaining nuclear fission is possible.

CORPORATE OVERVIEW

nuclear safety and radiation protection issues were provided to the public through the NSB information service. Staff of the bureau also provided interviews with the media and addressed community groups, including the ANSTO Community Consultative Committee, on issues related to the safety of ANSTO's nuclear plant and the expectations of the NSB for current and proposed facilities.

In addition, reports of the NSB which addressed community concerns about the safety of operations associated with ANSTO's reactors, and NSB assessments of Australian ports for visits by nuclear powered warships, were provided to public libraries in the locations concerned. Draft reports and proposals of bureau methods and criteria for the review of nuclear facilities were distributed to community groups and individual members of the public for comment, so that public expectations on these issues could be addressed.

EQUAL EMPLOYMENT OPPORTUNITIES IN APPOINTMENTS

The NSB is an Equal Employment Opportunity (EEO) employer under the terms of the Equal Employment Opportunity legislation. The bureau's EEO policy is intended to ensure the following objectives:

- fair practices in the workplace;
- management decisions made without bias;
- recognition of and respect for the social and cultural backgrounds of all staff and customers;
- employment practices which produce staff satisfaction, commitment to the job and the delivery of quality services to customers;
- improvements in productivity by guaranteeing that:
 - the best person is recruited and/or promoted;
 - skilled staff are retained;
 - training and development are linked to employee needs and customer needs; and
 - the workplace is efficient and free of harassment and discrimination.

The NSB's policy is consistent with the Commonwealth's aim to redress past imbalances by encouraging people from disadvantaged groups to compete for employment opportunities on merit.

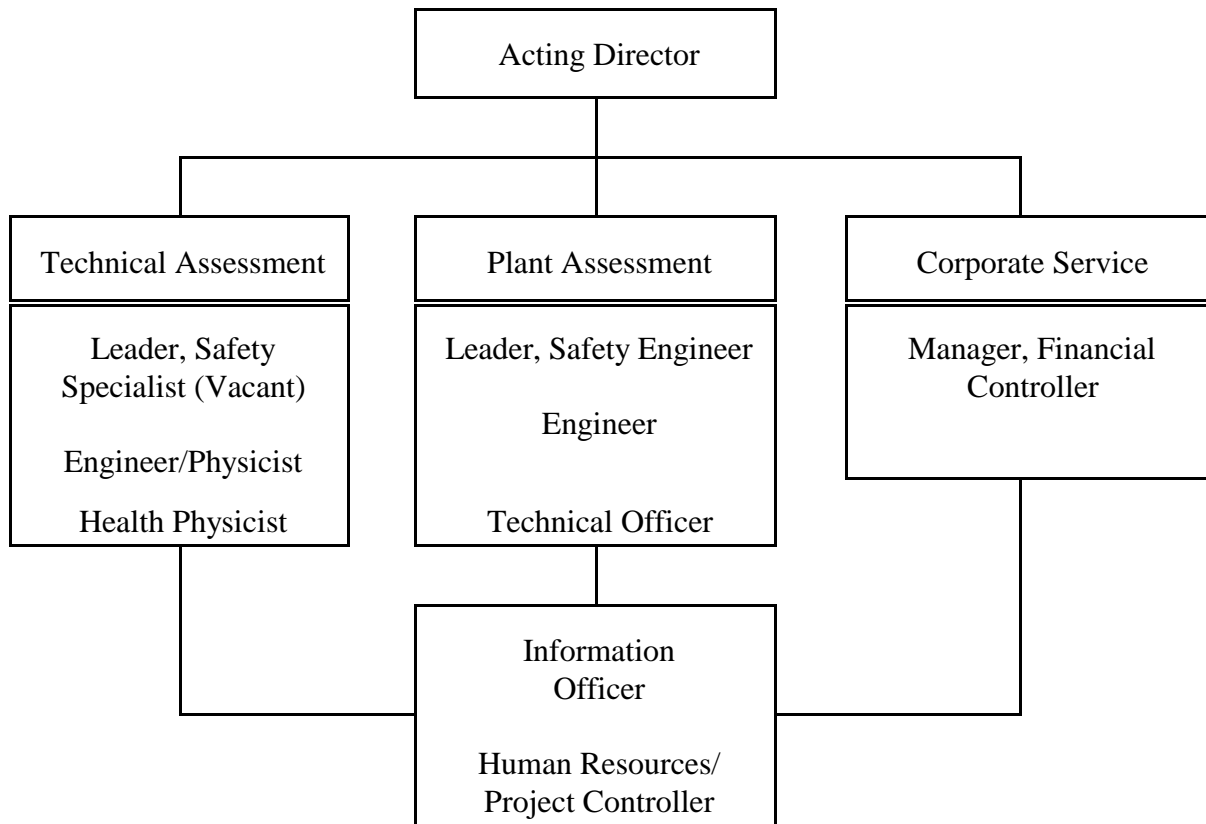
As of 30 June 1997, the number of permanent positions filled was nine, three of which were occupied by women and one by a person from a non-English speaking background (category 2).

DIRECTIONS GIVEN BY THE MINISTER TO THE NUCLEAR SAFETY BUREAU

No directions pursuant to Section 37D of the *Australian Nuclear Science and Technology Organisation Act 1987*, as amended, were given to the NSB for the period of this Annual Report.

CORPORATE OVERVIEW

Figure 1: Organisation of the Nuclear Safety Bureau as at 30 June 1997



CONTACT OFFICERS

Members of Parliament and Senators requiring additional information should contact:

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FUNCTIONS OF THE NSB UNDER SECTION 37A(1)(a) OF THE ACT

Monitor and review the safety of nuclear plant owned or operated by the Australian Nuclear Science and Technology Organisation (ANSTO).

Key Tasks

- Maintain comprehensive and current safety assessment criteria for nuclear plant.
- Ensure that safety assessment criteria reflect international best practice by taking into account operational experience in Australia and overseas, and evolving nuclear safety standards.
- Conduct regular and systematic reviews and audits to assess the safety of operation of ANSTO's nuclear plant and to identify operational deficiencies.
- Require corrective action by ANSTO to rectify operational deficiencies and ensure safe operation of nuclear plant.
- Conduct regular and systematic reviews and audits to assess the safety management of ANSTO's nuclear plant and to identify management deficiencies.
- Require corrective action by ANSTO to rectify safety management deficiencies and ensure adequate management of safety of nuclear plant.

Outcomes

ADOPTION OF THE INTERNATIONAL NUCLEAR EVENT SCALE

In 1992 the International Atomic Energy Agency (IAEA), in conjunction with the Nuclear Energy Agency (NEA) of the Organisation for Economic Co-operation and Development (OECD), invited nuclear and non-nuclear countries alike to formally adopt the International Nuclear Event Scale (INES), developed in 1990 for nuclear power reactors. The primary purpose of the INES is to facilitate communication between the nuclear community, the media and the public, in relation to events at nuclear installations. The scale goes from level 0 for events of no safety significance, to level 7 for major accidents such as the 1986 accident at the Chernobyl reactor. Currently 59 countries have adopted the INES for research and power reactors and other facilities.

For reporting purposes, from 1991 the NSB has assigned levels on the INES to events at ANSTO's reactors, on a trial basis. This involves the bureau rating events with a delay of up to about three months. However, the intended use of the INES involves prompt rating of events, usually by the facility operator, and review by the regulatory authority. Events at level 2 and above are notified to the IAEA within 24 hours, and communicated to the media and public.

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To progress Australia's adoption of the INES, the NSB proposed to end its trial use of the scale as of 1 July 1997, and for ANSTO to use the INES for reporting events at its reactors, as intended. In addition, the bureau proposed that both organisations commence, through the Department of Foreign Affairs and Trade, the process of formal adoption of the INES by Australia, and commit to participating in an IAEA training seminar on use of the scale.

Nuclear Safety Standards and Guidelines

The International Atomic Energy Agency (IAEA) and other prominent international organisations provide extensive nuclear and radiation safety guidance in the form of safety fundamentals, standards, guidelines and recommendations. A challenge of growing importance for regulatory bodies is to clarify those areas to which it assigns most importance, priority and focus when assessing the safety of nuclear facilities. That emphasis may vary from country to country, within a general regulatory framework.

Accordingly, to provide consistency in its approach to nuclear safety and to address international best practice, the NSB has improved its draft safety assessment policy document. The policy is based on the IAEA publication, *Basic Safety Principles for Nuclear Power Plants* (INSAG-3), prepared by the International Nuclear Safety Advisory Group. This emphasises safety culture, defence in depth and human factors in achieving nuclear and radiation safety. The Advisory Group provided additional guidance in the publication *Defence in Depth in Nuclear Safety* (INSAG-10).

The NSB safety assessment policy document lists the bureau's prime expectations in the application of INSAG-3. When the safety of a nuclear facility is assessed by the bureau, those expectations are applied first, then the remainder of INSAG-3 is applied. Whilst the expectations are not necessarily mandatory, and alternative methods may achieve equivalent levels of safety, the bureau gives its expectations the highest importance, priority and focus in its safety assessments.

The development of supporting safety guidelines, addressing siting, decommissioning, life extension, design and nuclear criticality control for nuclear facilities, has been initiated by the NSB. These supplement the bureau's safety assessment policy to assist the operating organisation in preparing its safety cases for nuclear facilities, and to decrease the likelihood of omitting important safety considerations.

Comments are invited on the Nuclear Safety Bureau's draft safety documents, and copies may be obtained from the bureau's information officer.

SAFETY OF HIFAR RESEARCH REACTOR

HIFAR is a DIDO-class research reactor designed primarily for materials testing, which commenced operation in 1958, and operates at a maximum thermal power of 10 megawatts. Currently, operations at HIFAR mainly involve irradiations for semiconductor manufacture and radioisotope production, and research using neutron beams.

Upgrade of the Authorisation - HIFAR Operation

The operation of HIFAR is controlled by the Authorisation - HIFAR Operation, introduced in 1983. The Authorisation consists of 23 Schedule Items, each of which contains specific safety requirements set by the NSB; documentation of ANSTO's arrangements to satisfy the requirements as agreed by the bureau; and an approval by the Executive Director, ANSTO to operate the reactor in accordance with the arrangements. Procedures for amending the arrangements are set by the NSB. Effectively the Authorisation is a licence, with attached conditions, for the safe operation of HIFAR.

In 1992 HIFAR management undertook a program for the overall upgrading of the Authorisation, with a completion date of April 1995. The primary objective of the upgrading was to ensure that the documentation referenced in, and supporting, the Authorisation is consistent with international safety standards for research reactors. In 1995 the NSB reviewed in detail the upgraded documentation and concluded that ANSTO had met the upgrade requirement. In addition, the bureau recommended actions that should be taken by ANSTO to further improve the Authorisation.

In addressing these recommendations, it was agreed by the NSB that HIFAR management should concentrate priorities on improving arrangements for the Schedule Items related to quality assurance programs, design information, the safety case, and operational safety limits and conditions for the operation of HIFAR. During the year, the HIFAR Quality System was certified to AS/NZS ISO 9001:1994. This is a significant achievement for HIFAR management and staff which provides a substantial contribution to the safety documentation for the reactor and enhances the safety of its operations. HIFAR management submitted that the bureau's requirements for quality assurance programs have been completely satisfied and, as a consequence, the requirements for records and reports have also been satisfied. The NSB is considering these submissions.

The HIFAR Safety Document forms the basis of the safety case for HIFAR. The NSB completed its review of a draft revision of the Safety Document, and provided detailed comments to ANSTO. Discussions on the draft revision are continuing.

The envelope of plant and procedural requirements for safe operation of the HIFAR reactor are set by the Operational Limits and Conditions, required under the Authorisation. The NSB reviewed revised limits and conditions and provided comments to HIFAR management. Several

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meetings were held with HIFAR management to discuss the bureau's comments and reach agreement. Implementation of the revised limits and conditions will achieve a significant upgrading in safety procedures.

The NSB also informed ANSTO management during the year that the bureau considered the Instrumentation Power Supply System to be a safety-related system and its configuration should be defined to assure a reliable electric supply to instrumentation. The bureau set out its position on the minimum plant requirements and required an updated program of work for the completion of the Instrumentation Power Supply System as an integral part of the Electrical Power Supply System.

Training and Accreditation of HIFAR Operating Staff

Before being authorised to perform their duties, reactor operations staff undergo a formal accreditation, and periodic re-accreditation is required. Appropriate training and periodic retraining of reactor operations and maintenance personnel is essential for the safe operation of nuclear plant, and is a prerequisite for gaining and maintaining accreditation.

The NSB monitors the accreditation and re-accreditation of key operating staff. An observer was provided by the bureau, as part of formal procedures, for the accreditation and the re-accreditation interviews of seven operations professionals during the reporting period. The bureau is satisfied that appropriate standards were maintained.

Unusual Operating Events

Under the Authorisation, the NSB requires that unusual operating events at the reactor, classified by HIFAR management as abnormal occurrences, are reported by ANSTO. These, and other unusual operating events, are reviewed by the bureau to assess the safety implications and to assign levels on the INES. During 1996–97 there were 43 abnormal occurrences at HIFAR compared to 34 the previous year. The numbers of events assigned each INES Level are shown in Table 1.

Table 1: INES Levels Assigned to HIFAR Abnormal Occurrences

| INES Level | 1996–97 | 1995–96 |
|-------------------|----------------|----------------|
| 2 | 0 | 0 |
| 1 | 3 | 7 |
| 0 | 40 | 27 |
| Total | 43 | 34 |

As shown in Table 2 below, the largest category of abnormal occurrences was equipment fault, some of which were assigned Level 1 on the INES, being anomalies beyond the authorised operating regime, although most were Level 0, having no safety significance. The number of 'human factors related' abnormal occurrences was less than in the previous year, and this is a

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commendable trend. Four abnormal occurrences classified as ‘miscellaneous’ include an unexplained temporary high radiation level on an irradiation rig, an unexplained negative reactor power transient of 9 per cent, and the unauthorised shutting-down of the reactor as part of industrial action.

Table 2: HIFAR Abnormal Occurrences - Breakdown by Type

| Occurrence Type | 1996–97 | 1995–96 |
|------------------------|----------------|----------------|
| Equipment fault | 35 | 27 |
| Human factors related | 4 | 6 |
| Miscellaneous | 4 | 1 |
| Total | 43 | 34 |

Remaining Life of the HIFAR Research Reactor

The HIFAR research reactor was designed in the mid-1950s, before nuclear safety philosophy and standards were formalised. Considerable safety systems upgrading has been achieved throughout the reactor’s operating life, and the NSB considers HIFAR to be safe. However, there is a gap between the design of existing plant safety systems and modern safety standards and expectations, due to the age of the plant and its design. As modern standards evolve, this gap widens. The NSB will not accept this situation indefinitely.

The safety of HIFAR may also be affected by the ageing or failure of several major components which are difficult to inspect and cannot easily be replaced. The increasing obsolescence of safety-related components and systems and the increasing unavailability of spare parts have detrimental effects on plant safety. In addition, the difficulty of inspection of key safety-related operational components creates uncertainty about their lifetimes.

The 1993 Research Reactor Review into the need for a new research reactor for Australia was advised by the NSB that, for planning purposes, the bureau considered that the remaining life of HIFAR would not extend beyond about ten years without major safety upgrading. Beyond this period the NSB would assess the safety case for HIFAR as it would for a new reactor. Therefore, the bureau requires that significant upgrading of the safety systems of HIFAR be undertaken by about 2003, unless the reactor is to be permanently shut down within an acceptable short period from that date. The safety of any life extension significantly beyond about 2003, including the upgrading of research and production facilities, would be assessed against modern nuclear standards and practices. Nevertheless, uncertainty would remain about the lifetime of some difficult-to-inspect components.

The probabilistic safety assessment being undertaken for HIFAR includes an assessment of components that might be life-limiting. The study, which is not yet complete, set out to identify components that perform functions critical to the operation or safety of the reactor but which are impractical to replace or repair.

Radiation Protection at HIFAR

The NSB has been monitoring the effectiveness of arrangements for health physics coverage at HIFAR since Health Physics Surveyors were removed from some shifts a number of years ago. During the year, the bureau accepted proposed changes to the arrangements for health physics coverage which would restore the availability of a surveyor on-site 24-hours per day. Implementation of the proposed arrangements will take some months, while additional staff are recruited and trained. The NSB has accepted interim arrangements, to apply until full coverage can be arranged, by which a health physics technician or professional will be on call to promptly respond to incidents at HIFAR during shifts where no such personnel are rostered on-site.

The minutes of meetings of ANSTO's Reactor Dose Reduction Working Party and the Nuclear Technology Division Health and Safety Committee are reviewed by the NSB as a means of monitoring radiation protection issues at HIFAR. The working party reported that the collective effective dose for HIFAR staff has risen significantly over the past year, but individual doses are still less than the occupational limits recommended by the National Health and Medical Research Council. The increase in collective dose is thought to be mainly due to increased workloads at the reactor, and is under investigation. The working party also noted investigations of ANSTO's personal dosimetry system which revealed that doses recorded between July 1993 to March 1996 underestimated the true dose by 12 per cent. Investigations of the angular response of the dosimeters used at HIFAR, to account for the direction of radiation to workers on the reactor top plate, are continuing.

Under the Authorisation, the NSB requires radiation doses to employees and the public to be as low as reasonably achievable. In response to a request from the Reactor Dose Reduction Working Party, ANSTO's Safety Division drafted a paper setting down the organisation's ALARA policy. The draft policy was amended to account for NSB comments and subsequently issued as an ANSTO Safety Directive. The Directive describes dose objectives and a process for ensuring that radiation exposures are ALARA which are consistent with national and international standards and best practice.

Audit of Radiation Protection at HIFAR

An audit of radiation protection at HIFAR was performed by an officer of the NSB, assisted by an officer from the Australian Radiation Laboratory, during December 1996. The audit criteria were based on ANSTO procedures and Safety Directives, and the bureau's expectations for radiation protection, drawn from national and international recommendations. The audit consisted of interviews and meetings with HIFAR and Safety Division staff and management, review of records and observation of HIFAR operations.

The audit confirmed that radiation doses to HIFAR staff over the preceding year have been less than the monthly action level, and well below the dose limits recommended by the National Health and Medical Research Council. Radiation protection at HIFAR was observed to be generally satisfactory. However, the NSB report on the audit (NSB 4/1997) notes four items that did not comply with audit criteria relating to documentation of procedures, calibration of

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radiation survey meters, signposting of radiation hazards and contamination monitoring of personnel. Actions to address these and other observations and suggestions of the auditors are progressing according to an action plan and schedule accepted by the NSB.

Radiation Dose Limits, Constraints and the ALARA Principle

ANSTO has put in place arrangements, under the Authorisation - HIFAR Operation, to satisfy the NSB requirement that radiation doses arising from reactor operations are less than the appropriate limits of the Australian National Health and Medical Research Council (NHMRC), and are kept as low as reasonably achievable (ALARA).

As a precaution, the NHMRC assumes that all exposures to ionising radiation carry some risk of harm to health, and this risk increases with increasing exposure. Consequently, practices which lead to an increased human exposure to radiation must be justified to ensure that the benefit derived from the practice outweighs the additional risk due to the increased exposure. In addition, radiation protection must be optimised, so exposure of individuals from each source of radiation, and the number of people exposed, is kept as low as reasonably achievable, economic and social factors being taken into account.

Dose limits represent risks from radiation exposure which are deemed to be just acceptable. The NHMRC recommends dose limits for occupational exposures which occur as a result of a person's employment, and exposures received by the public in general. Medical exposures are not subject to dose limits. The NHMRC-recommended radiation dose limit for the public is 1 mSv (1000 μ Sv) per year. This is about one half the average background radiation level received by Australians.

A dose constraint for the public should be chosen for each radiation source or practice to ensure the individual dose limit would not be exceeded when additional exposures from other sources or practices are added, and to promote good management. ANSTO's dose constraint for HIFAR, which has been agreed by the NSB, is 100 μ Sv per year for members of the public. For occupational exposures, the dose constraint corresponds to the dose which may be expected to be achieved in similar, well-managed practices.

Radiation protection is considered to be optimised when the level of protection needed to further decrease radiation exposure cannot be achieved without an unreasonable social or economic cost. The upper bound for optimisation is the dose constraint, which is the highest acceptable level of dose for a particular source or practice. Exposures may be reduced to a level where the associated risk is broadly acceptable to the general population without additional protection. At radiation doses below this level, called the ALARA objective, it is not considered necessary to demonstrate that the ALARA principle has been satisfied. ANSTO's ALARA objective for the public is 20 μ Sv per year, which is 2 per cent of the NHMRC limit and corresponds to a calculated risk of fatality of 1 chance in 1 000 000 per year.

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Radioactive Discharges to the Environment

Following withdrawal of monitoring by the NSW Environment Protection Authority (EPA), a program of independent monitoring of radioactive liquid and gaseous discharges from the Lucas Heights Science and Technology Centre, by the Australian Radiation Laboratory and the NSB, was put in place. Under this program, the laboratory independently verifies the discharge measurements reported by ANSTO, and the bureau inspects monitoring equipment. The NSB also reviews the discharge of radioactive materials from HIFAR, under the Authorisation, as part of its responsibility to monitor and review the safety of HIFAR operations.

Airborne Discharges

Radioactive airborne discharges are monitored and reviewed against working levels derived from the discharge limits previously authorised by the NSW EPA. The working levels, derived in 1969, are no longer appropriate for the current operations of the HIFAR reactor and, as discussed below, ANSTO and the NSB have been working to put an updated airborne radioactive discharge authorisation in place.

For the HIFAR reactor, the most significant radioactive airborne discharge is argon-41 (^{41}Ar), a short-lived radioactive gas produced by the neutron activation of air inside the reactor irradiation facilities. During the year, the release of ^{41}Ar exceeded both quarterly and annual working levels, as shown in Table 3. The lower amounts of ^{41}Ar in the first two quarters of 1995–96 compared to the following year are due to a three-month break in operations during the major shutdown of HIFAR in 1995 for maintenance and inspections. Airborne discharges of other radioactive materials from HIFAR were well within working levels.

Table 3: Airborne Discharges of ^{41}Ar from HIFAR 1996–97 (1995–96)

| Quarter Ending | Amount of ^{41}Ar (TBq) | | % of ^{41}Ar Working Level | |
|---------------------------|----------------------------------|--------------|-------------------------------------|--------------|
| September 96 (95) | 35.4 | (18.9) | 131 | (70) |
| December 96 (95) | 34.0 | (9.7) | 126 | (36) |
| March 97 (96) | 42.1 | (41.8) | 156 | (155) |
| June 97 (96) | 36.2 | (50.4) | 134 | (187) |
| Year 96–97 (95–96) | 148 | (121) | 137 | (111) |

ANSTO calculated that the radiation doses to the public arising from the airborne discharges from the entire site are well below the relevant dose limits recommended by the National Health and Medical Research Council, and that doses arising from airborne discharges from HIFAR are a fraction of the 100 μSv dose constraint agreed by the NSB and ANSTO. This has been independently confirmed by the bureau's own conservative calculations. Nevertheless, work is

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continuing at HIFAR to identify the sources of ^{41}Ar and to reduce the amount of airborne discharges from the reactor. On completion of this work, HIFAR management will be able to assess the options for reduction of the discharges, in line with the ANSTO policy of keeping radiation doses as low as reasonably achievable. Assessed maximum doses to the public from HIFAR approach ANSTO's ALARA objective of $20\ \mu\text{Sv}$ per year, below which it is not necessary to demonstrate that the doses are as low as reasonably achievable.

Revised Airborne Discharge Authorisation

To develop a method for establishing limits on airborne radioactive discharges from HIFAR, during the year the NSB completed a review of international recommendations and practices for the regulation of discharges. This work is published in the report *Regulation of Airborne Radioactive Discharges from HIFAR* (NSB 14/1996), copies of which were forwarded for comment to ANSTO, the Australian Radiation Laboratory, the radiation control officer in each Australian State and Territory, the Sutherland Shire Council and interested members of the public.

After considering comments, the NSB developed a draft authorisation for airborne radioactive discharges from HIFAR which would require the bureau to be notified if the discharges exceed monthly, quarterly or annual levels. These notification levels are based on current levels of airborne discharges from HIFAR and give recognition to the principle that radiation doses from discharges should be as low as reasonably achievable. The bureau's conservative dose assessment methods ensure that the radiation doses to the public would be extremely unlikely to exceed the dose constraint agreed by ANSTO and the NSB. Discussions on the draft NSB discharge authorisation are continuing, with the aim of agreeing to a process for the NSB and ANSTO to report discharges, in time for its use in the first quarter of 1997–98.

Liquid Discharges

Liquid discharges from the Lucas Heights site are authorised by the Sydney Water under a Trade Waste Agreement which specifies limits on the concentration of radioactive materials in the effluent. Measured concentrations at the ANSTO discharge point are compared to limits specified in the repealed NSW Radioactive Substances Regulations (1959). Additionally, since September 1995, calculated concentrations at the Cronulla Sewerage Discharge Plant are compared to the World Health Organisation's *Guidelines for Drinking Water Quality* (1993).

Groups of unspecified radionuclides are assessed against the limits for the most restrictive radionuclides. The concentrations of radioactivity in liquid discharges from the site for the year were within both discharge limits, as is shown in Table 4. ANSTO's measurements of the radioactivity in liquid effluents were verified independently by the Australian Radiation Laboratory.

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Table 4: Liquid Radioactive Discharges from the LHSTC³ for 1996–97 (1995–96)

| Unspecified Alpha Emitters(a) (MBq) | Unspecified Beta Emitters(b) (MBq) | Tritium (GBq) | % of NSW Concentration Limits | % of WHO Concentration Limits |
|----------------------------------------------------|---------------------------------------------------|--------------------------|----------------------------------------------|----------------------------------------------|
| 66.9 (60.6) | 1812 (1470) | 375 (914) | 32 (23) | 30 (29) |

(a) Assessed as all radium-226.

(b) Assessed as all strontium-90.

Audit of Radioactive Discharges from HIFAR

An NSB audit of radioactive discharges from HIFAR was performed in May 1997 by officers of the bureau assisted by an officer of the Australian Radiation Laboratory, together with an observer from the Office of the Supervising Scientist. The audit assessed compliance of HIFAR operations with criteria drawn from ANSTO's arrangements in the Authorisation - HIFAR Operation, and the bureau's expectations for the treatment, storage and disposal of radioactive solid, liquid and gaseous wastes, based on international best practices.

The audit found that radiation doses to staff and the public due to the discharges from HIFAR were well within the annual limits recommended by the NHMRC, and less than the dose constraints adopted by ANSTO. Additionally, ANSTO has adopted a policy to ensure that radiation doses are kept as low as reasonably achievable.

HIFAR operations were found to generally comply with audit criteria, except those relating to documentation of procedures and instructions, and the validation of monitoring methods. The auditors also noted the need for improvements to arrangements to ensure continued compliance with several audit criteria.

The findings of the audit were discussed with HIFAR and ANSTO Safety Division staff, and an action plan was promptly submitted by ANSTO. With minor amendments, the NSB considers the proposed actions to be satisfactory.

Emergency Arrangements at the Lucas Heights Science and Technology Centre

The ANSTO Local Liaison Working Party, formed under the NSW *Emergency Management and Rescue Act 1989*, coordinates the involvement of NSW agencies having responsibilities under the arrangements for emergencies at the Lucas Heights Science and Technology Centre (LHSTC). Meetings of the working party are held each quarter, and an NSB officer attends as an observer.

During the past three years ANSTO has completely redrafted and updated the emergency arrangements for the Science and Technology Centre. Drafting of Standing Operating Procedures

³ Lucas Heights Science and Technology Centre.

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which detail the response of each of ANSTO's operational units, continued during the year, with nine of the ten completed by the end of June 1997. Each of the NSW agencies has drafted separate Standing Operating Procedures.

The policy adopted by ANSTO and the working party is to test the emergency plans with a major exercise every few years and to complement this with the exercising of particular elements of the plans on a more regular basis. A major exercise is to be conducted during the second half of 1997.

ANSTO Emergency Exercises

Exercise 'Bushy', a table-top exercise involving participants from ANSTO and NSW agencies with observers from the NSB and a community group, was carried out at ANSTO in February 1997. The exercise tested the on-site and off-site response to a scenario of a bush fire which was assumed to spread onto the site and ignite the radioisotope production facility, causing an airborne release of radioactive material.

The exercise achieved its objectives of testing initial response procedures, interaction of ANSTO staff and NSW agencies and the understanding of the relevant evacuation arrangements. A report on the exercise was issued which included a number of actions arising from debriefing the participants and observers. The NSB considered that the exercise was very well run, with good performances by all participants.

The bureau is satisfied that the emergency arrangements at the Science and Technology Centre are suitable and in a satisfactory state of preparedness.

SAFETY OF MOATA RESEARCH REACTOR

Moata is a university training reactor of the 'Argonaut' type, which commenced operation in 1961 and operated at thermal powers up to 100 kilowatts until mid-1995, when it was closed down. Moata is the first nuclear reactor in Australia to enter the decommissioning phase of its life.

Authorisation - Moata Operation

The Authorisation - Moata Operation, signed into effect by the Acting Chairman of the ANSTO Board in June 1995, does not address decommissioning of the reactor. During the year, the NSB formally issued its Authorisation Requirement for Moata decommissioning. ANSTO management was advised that the decommissioning arrangements should ensure that radiation doses received by ANSTO employees and the public are kept within acceptable limits and are as low as reasonably achievable. Also, the arrangements should provide for the minimisation, treatment, safe storage and disposal of radioactive wastes arising from the decommissioning and dismantling of the reactor. ANSTO was required to provide, for NSB agreement, appropriate arrangements under the Authorisation covering the current status of the reactor.

Unusual Operating Events at Moata

The reactor remained shut down with the fuel unloaded to temporary storage. On the basis of ANSTO's inspection and gas sampling of the Moata fuel storage facility, the NSB is satisfied with the safety of Moata fuel storage arrangements. No Abnormal Occurrences at Moata were reported during the year.

Moata - Decommissioning

Operation of Moata ceased in May 1995 and the fuel was unloaded to a fuel storage facility in anticipation of permanent closure and decommissioning. During the previous reporting period, ANSTO management advised that a Moata Advisory Panel and a Moata Decommissioning Project Management Group had been formed. The NSB developed draft Safety Guidelines for Decommissioning of Australian Nuclear Facilities and these were forwarded to ANSTO and the Australian Radiation Laboratory for comment.

A draft Task Brief for the decommissioning of Moata, including a project management plan and schedule, has been provided by ANSTO at the bureau's request. Procedures and instructions for the initial phase of decommissioning, or the 'Post Operational Care' phase, are being developed by ANSTO.

SAFETY OF OTHER NUCLEAR AND ASSOCIATED PLANT

Criticality Safety Arrangements

ANSTO has put into place revised criticality⁴ safety arrangements to address the issues raised by the NSB during its 1995 audit of criticality safety arrangements at the Lucas Heights Science and Technology Centre. These arrangements were reviewed by the bureau during the year.

The NSB continues to have concerns regarding the revised criticality safety arrangements, particularly in relation to the issue of criticality exemption certificates, which are intended to indicate that criticality is impossible for a particular assembly of fissile material. The current arrangements allow a criticality exemption certificate to be issued on the basis of conservative calculations covering normal and abnormal conditions. In many cases the amount of fissile material may exceed a minimum critical mass.

A response to ANSTO's revised criticality safety arrangements is currently being considered within the NSB. To support its response, a safety guideline is being drafted to provide guidance on the bureau's approach to assessing the adequacy of criticality safety arrangements at Australian nuclear facilities.

⁴ 'Criticality' refers to the ability of an assembly of fissile material to support a self-sustaining nuclear chain reaction.

New and Spent Fuel Storage Facilities

During discussions with ANSTO on an NSB review of a vault for the storage of new (unirradiated) HIFAR fuel, it was apparent that there was not a common understanding of the role of the bureau at this and similar facilities. The bureau considers that such facilities are plant associated with HIFAR, and therefore subject to monitoring and review by the bureau under the Authorisation - HIFAR Operation, while ANSTO considers the NSB role to be advisory. Differences remain regarding the role of the bureau at a number of ANSTO non-reactor nuclear facilities, including new and spent fuel facilities at the Lucas Heights site.

The NSB recommended the preparation of a Safety Analysis Report for such facilities, and subsequently the bureau was provided with an ANSTO proforma for the preparation of a safety case. The bureau is reviewing this document against IAEA guidelines for the preparation of safety analysis reports. The Authorisation - HIFAR Operation is also being used by the bureau as a benchmark for reviewing the safety documentation for these non-reactor nuclear facilities. ANSTO has advised that it will submit for review a Safety Analysis Report for the unirradiated fuel store, which will consider all potential hazards, including the presence of fissile oxide materials in powder form within the store.

RESTRICTIONS AND CONDITIONS ON OPERATION OF NUCLEAR PLANT

Under Section 37C of the amended *Australian Nuclear Science and Technology Organisation Act 1987*, the NSB may impose restrictions or conditions on the operation of ANSTO's nuclear plant. The bureau uses the term 'restriction' to mean a requirement to shut down or delay start-up of a reactor. The terms 'condition' and 'requirement' are applied to all other types of intervention by the NSB. In assessing the safety of nuclear plant, the NSB considers both the requirements of the relevant Authorisations for reactor operations, and the current and evolving international standards of nuclear safety. The NSB placed the following restrictions, conditions or requirements on the operation of HIFAR, and Moata, during the year:

- **HIFAR Major Shutdowns**⁵ - The NSB imposed a requirement on the operation of HIFAR which set a minimum time after shutdown at which the core of the reactor can be unloaded during future HIFAR Major Shutdowns. The bureau also required that, as for the 1995 Major Shutdown, NSB agreement will be necessary before low power operation, as well as full power operation, following a Major Shutdown. These requirements are additional to those previously imposed on Major Shutdowns.
- **HIFAR Core Excess Reactivity**⁶ - On three occasions, as a result of the NSB granting ANSTO a temporary exemption from an Operational Limit and Condition, the NSB required

⁵ HIFAR Major Shutdowns are scheduled events which the bureau requires about every four years, in order to carry out inspections, maintenance and modifications to plant and equipment that cannot be done during routine monthly refuelling shutdowns.

⁶ Reactivity is a measure of a reactor's departure from criticality.

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ANSTO to provide notification of the measured core excess reactivity of HIFAR approximately 24 hours after startup. Satisfactory information was provided on each occasion.

- **Moata Decommissioning** - The NSB required ANSTO to provide a plan and schedule for the initial phase of decommissioning the reactor and, by the end of June 1997, documentation detailing the arrangements to satisfy the Requirement in the Authorisation - Moata Operation for the initial phase of Moata decommissioning. Appropriate documentation was provided and is being reviewed by the bureau.

CONCLUSIONS ON THE SAFETY OF ANSTO'S NUCLEAR PLANT

The NSB continually monitors and reviews the operation of ANSTO's nuclear plant against the bureau's expectations for nuclear safety and radiation protection. These expectations are drawn from Australian and international standards and recommendations, to reflect best practice for regulation of nuclear facilities. Where significant deficiencies in operations have been found, the NSB has imposed requirements to ensure the safety of operations, and ANSTO has complied. Plans to address other actions arising from the bureau's audits of operations have been submitted by ANSTO and agreed by the NSB.

The incidence of safety-significant abnormal occurrences at a nuclear facility is a measure of the compliance of operations with safety requirements such as operational limits and conditions. Although there was an increase in the total number of abnormal occurrences reported at HIFAR in 1996-97 compared to the previous year, the number of safety significant occurrences (INES Level 1 or higher) was significantly reduced. The increase in the number of abnormal occurrences is almost entirely due to equipment fault, which is characteristic of an ageing plant. It should be noted that the number of 'human factors related' abnormal occurrences in 1996-97 was reduced compared to the previous year.

The NSB has concluded that, overall, the safety of ANSTO's nuclear plant during the year was acceptable, and that the associated risks to on-site personnel and the public were maintained at an acceptably low level.

International Nuclear Safety Culture

The International Atomic Energy Agency (IAEA) 1997 Nuclear Safety Review describes the role of the agency in fostering a global nuclear safety culture, through the development of an international framework for nuclear safety. This framework now extends to all nuclear facilities, and more general uses of radiation. Three components constitute the international framework:

- legally binding international agreements;
- non-binding consensus safety standards; and
- review and advisory services.

International agreements have been sponsored by the IAEA, in the form of conventions with legal requirements on participants, covering liability for nuclear damage, physical protection of nuclear material, notification and assistance after nuclear accidents, and nuclear safety. Australia is generally a party to these conventions. The Convention on Nuclear Safety, which came into force in October 1996, is a major achievement in promoting international nuclear safety. The Joint Convention on spent fuel and radioactive waste management was concluded in March 1997, and is expected to be adopted in September 1997. These conventions place safety obligations on contracting countries, set levels of safety to be achieved and provide for peer review.

While IAEA safety fundamentals, standards and guidelines are non-binding, they are often incorporated in the legislative framework of member countries. In particular, the IAEA Regulations for the Safe Transport of Radioactive Material are adopted in many countries as legal requirements. In addition, the NHMRC has published recommendations for radiation protection which are based on the 1994 International Basic Safety Standards for Protection Against Ionizing Radiation and for the Safety of Radiation Sources, jointly sponsored by the IAEA and other international organisations. Compliance with these recommendations is required by regulatory authorities in Australia, and is expected by the NSB.

Standards and guides for nuclear power and research facilities have been published as IAEA Nuclear Safety Standards, and have been adopted, where appropriate, by the bureau. Most significantly, the Basic Safety Standards for Nuclear Power Plants, published by the agency's International Nuclear Safety Advisory Group, form the basis of the bureau's draft safety assessment policy.

Peer review and advisory services provided by the IAEA have been very effective in sharing international experience on nuclear safety, and in promoting good safety practices. These services include Operational Safety Review Team missions, which use international experts to assess plant management and operational safety performance at nuclear power facilities. Officers of the NSB have in past years observed missions in China and Switzerland, and have benefited from experiencing this audit and review process. More recently, an agency peer-review team visited Australia to undertake an independent review of the probabilistic safety assessment of HIFAR.

FUNCTIONS OF THE NSB UNDER SECTION 37A(1)(b) OF THE ACT

Provide technical advice to the Commonwealth on the safety of nuclear plant and related matters.

Key Tasks

- Provide competent advice on nuclear safety and radiation protection of existing or proposed nuclear plant used for power generation, propulsion, or research and related matters.
- Ensure that the safety assessment criteria applied to visits to Australia by nuclear powered ships takes into account current radiation protection and nuclear safety standards.
- Ensure that international best practice is used for the safety assessments of visits by nuclear powered warships to Australian ports.

Outcomes

PROBABILISTIC SAFETY ASSESSMENT OF HIFAR

The United States company PLG Inc. (part of Princeton Resource Associates) was selected by the Department of Industry, Science and Tourism (DIST) to perform a probabilistic safety assessment (PSA) and residual life study for HIFAR, as recommended by the 1993 Research Reactor Review. The NSB reviewed documentation as the study progressed, including the draft report, and provided comments and advice to DIST's Technical Reference Committee. In general the bureau considered the study to be comprehensive, with detailed and very clear event sequence diagrams and dependency matrices that give good insight into possible system interactions.

An International Atomic Energy Agency peer-review team visited Australia to undertake an independent review of the PSA. The team included experts from Germany, the United Kingdom and Sweden. The NSB reviewed the draft report of the peer-review team and concluded that the peer review was competent and thorough. Many of the matters raised by the team had been the subject of previous comments by the NSB, and the bureau generally supported the team's conclusions and recommendations.

PLG Inc. is working to address the comments of the peer-review team, the NSB and others, and to prepare a final report of the HIFAR probabilistic safety assessment.

VISITS BY NUCLEAR POWERED WARSHIPS TO AUSTRALIA

Visits by nuclear powered warships (NPW) to Australian ports are accepted only to berths and anchorages that have been assessed against radiological criteria and approved by the Visiting Ships Panel (Nuclear) (VSP(N)), a Commonwealth interdepartmental committee responsible for maintaining the arrangements for visits. Visits must comply with conditions of entry, including the existence of satisfactory emergency arrangements. Approvals of ports are revalidated about every 18 months.

Port Assessments

The NSB program of updating the radiological assessments of Australian ports continued during the year, based on priorities agreed by the VSP(N). Assessments for the ports of Fisherman Islands, Queensland and Melbourne, Victoria were updated taking into account evolving radiological risk estimates, changes in populations surrounding the ports, improved meteorological data and berthing arrangements. Copies of the port assessment reports were provided to Commonwealth, State and Territory authorities and local libraries in the port areas. Also, an initial radiological assessment for Port Kembla in New South Wales was prepared.

Emergency Exercises and Port Validation

The NSB contributed to the evaluation of emergency arrangements for visits by NPWs and revalidation of ports. Officers of the NSB participated in revalidation of the port of Fisherman Islands, Queensland, which included a major emergency exercise, and also attended an emergency exercise conducted for the berth of HMAS Stirling, Western Australia.

The bureau updated its CLOUD computer spreadsheet used for making decisions on the need and scope of countermeasures following a hypothetical reactor accident on board a vessel, making the spreadsheet more compatible with the existing emergency arrangements. Copies of the software and associated instructions were forwarded to Commonwealth, State and Territory authorities involved in port emergency arrangements.



Monitoring for contamination during an emergency exercise in the Port of Brisbane

Nuclear Powered Warship Reference Accident

The radiological assessments to determine the suitability of Australian ports for visits by nuclear powered warships are carried out by evaluating the consequences of a hypothetical reference accident to the nuclear reactor on board a vessel in port. The consequences are compared with radiological acceptance criteria.

The NSB completed reviews and published working papers on both the reference accident and the radiological acceptance criteria. These papers were discussed by the VSP(N) technical group and presented at the biennial seminar of Commonwealth, State and Territory agencies with responsibilities for NPW visits. The proposed changes to the reference accident consequence

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modelling, and the radiological acceptability criteria, received the support of both the VSP(N) technical group and seminar participants.

As a result, the NSB, in conjunction with the VSP(N), is currently working towards finalising a new reference accident model and radiological acceptability criteria for assessing Australian ports for NPW visits. As part of this process, an NSB officer visited authorities in the United Kingdom and Canada involved with the safety of nuclear powered warships. The information and references obtained during this visit will be considered in the revision of the reference accident.

Australian Radiation Protection and Nuclear Safety Agency

The Commonwealth Government has announced its decision to establish the Australian Radiation Protection and Nuclear Safety Agency (ARPANSA) from 1 July 1998. The new agency will be formed by combining the expertise and resources of the Nuclear Safety Bureau and the Australian Radiation Laboratory to carry out the following functions:

- Regulate activities within the Commonwealth which involve radiation and nuclear safety, most of which are not presently regulated.
- Develop, jointly with the States and Territories, uniform radiation protection and nuclear safety controls throughout Australia, to protect workers and the public, including for research reactors, uranium mining and the management of radioactive waste.
- Provide advice on radiation protection and nuclear safety to the Government and public.
- Undertake research and provide services of a high standard to ensure radiation protection and nuclear safety.

What will regulation involve?

ARPANSA will establish safety standards and ensure that Commonwealth users of radiation adhere to them by requiring all radiation sources and nuclear facilities to be registered and users and operators to be licensed. Under the proposed legislation, ARPANSA will be empowered to audit the performance of Commonwealth users, enforce compliance with standards and codes of practice, and impose penalties for significant deficiencies.

What are the present regulatory arrangements for the Commonwealth?

Generally speaking, Commonwealth agencies have been responsible in protecting the health and safety of their employees and the public. However, notwithstanding the review and monitoring of the safety of operation of ANSTO's nuclear plant by the NSB, Commonwealth users of radiation have not been subject to independent scrutiny by a body with appropriate regulatory powers. The new body is being introduced to ensure proper regulatory control in line with world standards and public expectations, rather than to address any evident shortcomings of currently unregulated organisations.

How will transparency be ensured and public concerns be taken into account?

There will be community and stakeholder representation on committees and working parties responsible for advising ARPANSA and the Minister. The process of developing standards and codes of practice will also be subject to public scrutiny, input and comment. ARPANSA will prepare an annual report to the Parliament.

How will ARPANSA ensure that it meets international best practice?

Australia is a party to international conventions on nuclear safety and radioactive waste management. ARPANSA will maintain involvement with international organisations such as the IAEA and the International Commission on Radiological Protection, and best practices will be ensured by incorporating their guidance into regulations and codes of practice.

FUNCTIONS OF THE NSB UNDER SECTION 37A(1)(c) OF THE ACT

Such other functions as the Minister has determined in writing.

- Contribute to technical work associated with the *Environment Protection (Nuclear Codes) Act 1978*.
- Participate in activities of the International Atomic Energy Agency and the Organisation for Economic Co-operation and Development's Nuclear Energy Agency relevant to the other functions of the NSB.

Key Tasks

- Ensure, with regard to nuclear regulatory issues, that the Australian Code of Practice for the Safe Transport of Radioactive Substances provides a safe system of transport for Australia.
- Ensure, to the greatest extent practicable, consistency between Australian policies and practices and the programs and publications of the IAEA and the Nuclear Energy Agency of the Organisation for Economic Co-operation and Development, with regard to nuclear safety regulatory issues and consideration of Australia's interests in these areas.

Outcomes

CODE OF PRACTICE FOR THE SAFE TRANSPORT OF RADIOACTIVE SUBSTANCES

International Atomic Energy Agency Transport Safety Standards Advisory Committee

The International Atomic Energy Agency's (IAEA) Regulations for the Safe Transport of Radioactive Material are widely adopted throughout the world. In Australia they are implemented as the Code of Practice for the Safe Transport of Radioactive Substances 1990, which was promulgated under the *Environment Protection (Nuclear Codes) Act 1978*. The IAEA regulations are maintained through its Transport Safety Standards Advisory Committee (TRANSSAC), and revised about every ten years. The Australian member on this committee is provided by the NSB.

During the latter part of 1996 the IAEA published revised transport regulations. The main changes are: incorporation of the revised radiation dose limits recommended by the International Commission on Radiological Protection (ICRP 60); exemption levels consistent with the International Basic Safety Standards; regulations covering packages for the transport of uranium hexafluoride and packages designed specifically for air transport; radiation protection programs; and requirements for fissile materials. The edition of the IAEA Transport Regulations currently in use was published in 1985 and amended in 1990, and the new edition will not be fully implemented world-wide until 1 January 2001. The Australian code of practice will need to be revised to reflect the new IAEA regulations.

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Documents supporting the new regulations are currently being revised under the supervision of TRANSSAC, to be consistent with the 1996 edition of the regulations. This supporting documentation will be published in the next year as new safety guidelines with the titles *Advisory Material for the Regulations for the Safe Transport of Radioactive Material (1996 Edition)* and *Emergency Response Planning and Preparedness for Transport Accidents Involving Radioactive Material*.

There was no Competent Authority to specifically regulate the land transport of radioactive material owned by the Commonwealth. In order to overcome this regulatory gap, an Order-in-Council was signed in December 1996 to make the Australian Radiation Laboratory and NSB joint Competent Authorities for the land transport of Commonwealth-owned radioactive material, to come into effect on 1 July 1997.

Sea Transport of Radioactive Material

The Code for the Safe Carriage of Irradiated Nuclear Fuel, Plutonium and High-Level Radioactive Waste in Flasks on Board Ships was adopted in November 1993 by the International Maritime Organisation (IMO) Assembly as a voluntary code of practice. This followed the detailed considerations and proposals of two joint working group meetings of the IMO together with the International Atomic Energy Agency and the United Nations Environment Programme.

During the year, and at the request of the Australian Maritime Safety Authority, the Competent Authority for the sea transport of radioactive material, the NSB reviewed an ANSTO submission to amend the package approval certificate for ANSTO's cask for the transport of spent nuclear fuel. This is required in preparation for a shipment overseas of HIFAR spent fuel.

INTERNATIONAL CONVENTION ON NUCLEAR SAFETY

Under the auspices of the IAEA, the International Convention on Nuclear Safety entered into force in October 1996. The convention applies to land-based civil nuclear power plants, and places obligations on the signatory States including requirements for a regulatory organisation as well as a number of other items important for safe operation. The convention is also open to States which do not have nuclear power plants. As of 30 June 1997, 65 States had signed the convention and of these, 39, including Australia, had deposited an instrument of ratification, acceptance or approval.

Under the convention, the safety of existing nuclear power plants must be periodically assessed by a peer review process, providing transparency to other countries. Where required, all reasonably practical improvements to safety must be made. If the safety improvements required by the convention cannot be achieved, the affected power plant must be shut down as soon as it is practical to do so. Social, environmental and economic factors may be taken into account in the timing of a plant shutdown. Signatory States, including those not possessing civil nuclear power plants, are required to put in place emergency response plans to deal with the trans-boundary effects of an accident at a nuclear power plant.

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A meeting of States under the convention was held in April 1997 to agree the peer review process, in preparation for the first peer review meeting to be held in April 1999. The NSB provided a delegate to the preparatory meeting and, in consultation with ANSTO and the Department of Foreign Affairs and Trade (DFAT), the bureau prepared a briefing for the Australian delegation.

During the year the NSB provided advice recommending ratification by Australia of the Convention on Nuclear Safety, to the Minister for Health and Family Services and DFAT. Also, a bureau officer appeared as a witness before the Federal Parliament's Joint Standing Committee on Treaties. Australia ratified the Convention in December 1996. The NSB has been designated by the Government to take primary responsibility for Australia's obligations under the Convention, working in consultation with other agencies.

JOINT CONVENTION ON THE SAFETY OF SPENT FUEL MANAGEMENT AND ON THE SAFETY OF RADIOACTIVE WASTE MANAGEMENT

Following the adoption of the IAEA's International Convention on Nuclear Safety in 1994, negotiations began, under the auspices of the IAEA, on the development of a convention on the safety of radioactive waste management. The convention will promote the safe and environmentally sound management of radioactive waste throughout the world, by encouraging sound national requirements and international cooperation. Articles of the convention will cover all aspects of radioactive waste management, including general safety requirements, legislative and regulatory requirements, operational radiation protection, existing facilities and past practices, radioactive waste management facilities, trans-boundary movement and reporting.

The NSB has provided comments on drafts of the convention to the Department of Primary Industries and Energy, which has the primary responsibility for Australia's position on the convention. In particular, the bureau has strongly supported the inclusion of all spent nuclear fuel within the convention. Some member states disagreed with this approach, arguing that spent fuel destined for reprocessing is a resource, rather than waste.

Negotiations on the draft convention were concluded in March 1997, and in June the IAEA Board of Governors agreed that a Diplomatic Conference be convened on 1 September 1997 for the purpose of adopting the draft Joint Convention on the Safety of Spent Fuel Management and on the Safety of Radioactive Waste Management. The draft is consistent with the Australian position in a number of important issues, including the inclusion of spent nuclear fuel and the implementation of the convention under a federal system. There are several outstanding issues still to be resolved, but it is expected that the convention will be open for signature at the General Conference of the IAEA in September 1997. Signing and ratification of the convention by Australia will depend on consultations between the Federal, State and Territory Governments, and any necessary modifications to legislation. However, it is expected that Australia will be able to take part in the first review meeting of the convention, to be held within 30 months of its entry into force.

ATTENDANCE AT MEETINGS OF THE OECD/NEA

The Organisation for Economic Co-operation and Development (OECD) established its Nuclear Energy Agency (NEA) to encourage the safe development of electricity generation by nuclear energy. The NEA undertakes its activities through standing committees which cover particular parts of the nuclear industry. The three committees having activities related to the NSB are the Committee on the Safety of Nuclear Installations (CSNI), the Committee on Nuclear Regulatory Activities (CNRA) and the Committee on Radiation Protection and Public Health (CRPPH). These committees review and discuss reports from groups of sub-committees and working parties that carry out the detailed nuclear safety research program.

The functions of the bureau include providing advice to the Commonwealth on the safety of nuclear plant. Attendance at these meetings helps Australia to monitor the programs for safety and regulation of nuclear installations and radiation protection practices in member States of the OECD, to advise the committees of relevant developments in Australia and to participate in the policy-making of the NEA. The NSB provided the Australian delegates to the annual meetings of these committees during the year, and contributed to specialist technical meetings, which were also attended by an NSB officer.

REPORTS OF THE NSB

- The NSB must submit an Annual Report under Section 63M of the *Audit Act 1901* (*Australian Nuclear Science and Technology Organisation Amendment Act 1992*, Section 36R).
- The NSB must submit reports to the Minister relating to the performance of the functions of the NSB as the NSB considers appropriate (*Australian Nuclear Science and Technology Organisation Amendment Act 1992*, Section 37U(1)).
- The NSB must provide a quarterly report to the Minister (*Australian Nuclear Science and Technology Organisation Amendment Act 1992*, Section 37U(2)).

Key Tasks

- Satisfy requirements under the *Audit Act 1901* in a timely and efficient manner.
- Provide clear and unequivocal reports on the results of the monitoring and reviewing of ANSTO's nuclear plant.
- Report on significant developments with regard to nuclear plant safety issues in the nuclear industry.
- Make recommendations to the Minister regarding proposed changes to legislation relevant to the functions of the NSB.

Outcomes

ANNUAL REPORT

The Annual Report of the NSB for 1995–96 was submitted to the Minister under Section 63M of the *Audit Act 1901*. The Senate Community Affairs legislation Committee considered that the report provided a comprehensive overview of the bureau's functions and operations, and met all reporting requirements.

QUARTERLY REPORTS TO THE MINISTER

Reports on the performance of the NSB were submitted to the Minister each quarter under Section 37U(2) of the *Australian Nuclear Science and Technology Organisation Amendment Act 1992*, and were tabled in both Houses of Parliament.

NUCLEAR SAFETY BUREAU REPORTS

The following technical reports and working papers were published during the year:

REPORTS OF THE NSB

| | | |
|---------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------|
| NSB 11/1996 | Safety of Operation of ANSTO's Nuclear Plant for the period 1 April to 30 June 1996 | |
| NSB 12/1996 | Radiological Assessment of Fisherman Islands, Brisbane for Visits by Nuclear Powered Warships | |
| NSB 13/1996 | Radiological Assessment of Port Kembla for Visits by Nuclear Powered Warships | |
| NSB 14/1996 | Regulation of Airborne Radioactive Discharges from HIFAR | D J Westall |
| NSB WP15/1996 | Review of Accident Consequence Calculations used in the Assessment of the Suitability of Australian Ports for Visits by Nuclear Powered Warships - Working Paper | A J Frikken |
| NSB WP16/1996 | Review of Radiological Criteria used in the Assessment of the Suitability of Australian Ports for Visits by Nuclear Powered Warships - Working Paper | D J Westall |
| NSB 17/1996 | Safety of Operation of ANSTO's Nuclear Plant for the period 1 July to 30 September 1996 | |
| NSB 1/1997 | A Survey to Assess Regulatory Influence on Safety Culture at the HIFAR Reactor | A J Frikken |
| NSB 2/1997 | Safety of Operation of ANSTO's Nuclear Plant for the period 1 October to 31 December 1996 | |
| NSB 3/1997 | Radiological Assessment of the Port of Melbourne for Visits by Nuclear Powered Warships | |
| NSB 4/1997 | 1996 Audit of Radiation Protection at HIFAR | D J Westall |
| NSB 5/1997 | Visit Report - Annual Meeting of the NEA Committee on Radiation Protection and Public Health and the IAEA Preparatory Meeting for the Nuclear Safety Convention | D I Macnab |
| NSB 7/1997 | Safety of Operation of ANSTO's Nuclear Plant for the period 1 January to 31 March 1997 | |
| NSB 8/1997 | 1997 Audit of Radioactive Discharges from HIFAR | D J Westall |

Note: NSB 6/1997 was not published during the reporting period.

NUCLEAR REGULATORY ENVIRONMENT

In fulfilling its functions and ensuring that its safety assessment criteria and expectations reflect best practice, the NSB examines nuclear operations and regulation throughout the world. Exchanges of information with Asian nuclear regulatory authorities are particularly useful, as are contacts with OECD authorities including those in the United Kingdom, the United States and Canada. The bureau also maintains contact with Australian State and Territory radiation regulatory authorities, especially with regard to radiation protection, transport of radioactive materials and emergency arrangements for visits by nuclear powered warships.

COOPERATIVE AGREEMENT WITH KOREAN INSTITUTE OF NUCLEAR SAFETY

As previously reported, the NSB and the Korean Institute of Nuclear Safety (KINS) have agreed to exchange information on the regulation of sources of radiation and research reactors. Several projects were agreed as being useful to both organisations, and an NSB officer visited KINS in 1996. Officers of KINS will visit the bureau in July 1997 to work on specific collaborative projects covering regulation of the use and transport of radioactive materials, radioisotope production facilities, research reactor modifications and maintenance, and new and spent fuel management.

VISITORS TO THE NUCLEAR SAFETY BUREAU

Mr Carl Nohay, a Senior Research Specialist of the Nuclear Regulations Licensing and Safeguards Division, Philippine Nuclear Research Institute, visited the NSB for a week in July 1996 as an IAEA Fellow to discuss the bureau's review of radiation protection and radioactive waste management.

The Chairman, United States Nuclear Regulatory Commission (NRC), Dr Shirley Ann Jackson and NRC and United States Consular officials, visited the NSB in April and met with senior bureau staff. A wide range of subjects was discussed including the role of nuclear regulatory authorities, regional plans for nuclear facilities, the proposed Commonwealth regulatory authority, the International Nuclear Regulators Association and future collaboration and cooperation between the NRC and the NSB. The proposed regulation of United States Department of Energy facilities by the NRC was also discussed, in light of proposals for regulation of ANSTO and other Commonwealth facilities.



Dr Shirley Ann Jackson, US NRC Chairman
with Vince Diamond of the NSB

NUCLEAR REGULATORY ENVIRONMENT

Officers from the nuclear regulatory agencies of China, Japan, Malaysia and the Philippines visited the NSB during an international workshop on nuclear safety culture, held in Sydney in January 1997. Areas of common interest, such as staff training and experience, audits, emergency planning and response and regulatory practices, were discussed. The visit established new links with regional regulators and strengthened existing relationships. Future collaborative projects and attachments or exchanges of officers were also discussed, and the visitors were receptive to the possibility of future work with the NSB.

OVERSEAS VISITS BY NUCLEAR SAFETY BUREAU STAFF

As the Australian delegate, Mr D I Macnab, Acting Director NSB, attended the annual meetings of the OECD/NEA Committee on the Safety of Nuclear Installations and the Committee on Nuclear Regulatory Activities from 2 to 6 December 1996 in Paris, France. The reasons for attending these meetings were to keep Australia informed on nuclear safety programs in OECD member countries, and to advise the committees of developments in Australia. In the United Kingdom, Mr Macnab met with officers of the Environment Agency to discuss regulation of routine environmental discharges of radioactive wastes, and the Health and Safety Executive to discuss regulation of new and spent nuclear fuel storage facilities.

Mr T Mountford-Smith, Senior Engineer, attended, as Australian delegate, the second meeting of the TRANSSAC in Vienna, Austria from 10 to 14 March 1997. TRANSSAC focuses on safety and regulations for the transport of radioactive materials.

Mr Macnab attended, as the Australian delegate, the annual meeting of the OECD/NEA Committee on Radiation Protection and Public Health in Paris, France on 16–17 April 1997. Mr Macnab also attended the Preparatory Meeting of Contracting parties to the IAEA Convention on Nuclear Safety in Vienna, Austria from 21–25 April 1997. The Convention establishes an international framework for cooperation on, and regulation of, civil nuclear power stations, and was ratified by Australia in December 1996. The Minister for Health and Family Services agreed that the bureau should accept primary responsibility for Australia's obligations under the Convention. Mr. Macnab also visited a research reactor, under construction in Munich, Germany.

Mr D J Westall, Health Physicist, visited the headquarters of the United States Nuclear Regulatory Commission in Maryland, USA in June 1997, during a recall to duty while on private travel. Mr Westall discussed developments in nuclear regulation in Australia and the United States with NRC staff involved in international programs, non-power reactor assessment and licensing, and the regulation of United States Department of Energy facilities. The Chairman of the Commission, Dr Shirley Ann Jackson, also received an update on the information presented by the bureau during her visit to Australia in April 1997.

Mr T V Diamond, Leader, Plant Assessment, attended, as the Australian delegate, a special issues meeting of the OECD/NEA Committee on Nuclear Regulatory Activities to review procedures and criteria for regulatory applications of probabilistic safety assessments, in Paris during June 1997. Following the meeting, Mr Diamond met with agencies of the United Kingdom Ministry of Defence to discuss the safety of British nuclear powered warships. Mr Diamond then travelled

NUCLEAR REGULATORY ENVIRONMENT

to Canada and met with the Director-General, Nuclear Safety, Canadian Defence Forces, for discussions on the safety assessment of visits of nuclear powered warships to Canadian ports. While in Canada, Mr Diamond visited the Atomic Energy Control Board to discuss the safety and licensing of research reactors and other non-power nuclear facilities, and the Atomic Energy of Canada Limited to discuss reactor design, criticality safety assessments and to visit the NRU research reactor facility.

Mr A Frikken, Engineer/Physicist, was selected to participate in the IAEA-Interregional Training Course on instrumentation and control of nuclear power plants. The course was held at the Centre for Advanced Technological and Environmental Training, Karlsruhe Research Centre, Germany from 3 June to 3 July 1997.

PAPERS PRESENTED AT CONFERENCES AND MEETINGS

The following papers were presented by NSB officers at conferences and meetings:

| | | |
|----------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------|--------------------------------------------------------------------------------------------------|
| Regulatory Review of Releases from HIFAR of Radioactive Airborne Effluent | D Westall D I Macnab | Engineering and Physical Sciences in Medicine and Health Conference, Canberra, ACT, October 1996 |
| Benchmark Accident Scenarios for Nuclear Powered Warship Visits to Australian Ports | A Frikken | Engineering and Physical Sciences in Medicine and Health Conference, Canberra, ACT, October 1996 |
| Code of Practice for the Safe Transport of Radioactive Substances - Nuclear Safety Bureau Experience | T Mountford-Smith | Engineering and Physical Sciences in Medicine and Health Conference, Canberra, ACT, October 1996 |
| Changes to the Method of Calculating the Consequences of the Reference Accident for Assessing the Suitability of Australian Ports for Nuclear Powered Warship Visits | A Frikken | Biennial Nuclear Powered Warship Seminar, Mt. Macedon, Victoria, November 1996 |
| Changes to the Radiological Criteria Used to Assess the Suitability of Australian Ports for Visits by Nuclear Powered Warships | D I Macnab | Biennial Nuclear Powered Warship Seminar, Mt. Macedon, Victoria, November 1996 |

NUCLEAR REGULATORY ENVIRONMENT

| | | |
|---------------------------------------------------------------------------------------------------------------|-----------|------------------------------------------------------------------------------------------------------------|
| Decision-making Techniques for Implementation of Countermeasures Following a Nuclear Powered Warship Accident | A Frikken | Biennial Nuclear Powered Warship Seminar, Mt. Macedon, Victoria, November 1996 |
| A Survey to Assess Regulatory Influence on Safety Culture at the HIFAR Reactor | A Frikken | International Conference on Nuclear Cooperation in Asia Safety Culture Workshop, Sydney, NSW, January 1997 |

AUSTRALIAN RADIATION AND NUCLEAR COMMITTEES

Radiation activities in Australia are regulated individually by State and Territory governments. National recommendations on requirements for radiation protection and health are developed through the Radiation Health Committee, consisting of State and Territory Radiation Control Officers, Commonwealth officers and other individuals with expertise in radiation protection. The Australian Radiation Laboratory provides the secretariat for the committee, while the NSB contributes to the work of the committee and is represented at committee meetings by an observer. During the year the committee considered revisions to several codes of practice, policy on the use of radioactive materials for research on human subjects, the establishment of the national radiation dose register, and general guidance on radiation health effects. In particular, the NSB contributed to the revision of recommendations on intervention in emergency situations, and to the development of a standard format for codes of practice.

The Radiation Protection Panel of the Radiation Health Committee consists of State and Territory Radiation Control Officers, and representatives of the Australian Radiation Laboratory and the NSB. As well as particular regulatory issues, the panel has been considering the differences between the regulatory requirements of the States and Territories, and is developing agreed standards of regulation which may be adopted in all jurisdictions in order to increase the uniformity of current requirements.

Revisions of the codes of practice promulgated under the *Environment Protection (Nuclear Codes) Act 1978* were initiated during the year through the formation of the Nuclear Codes Committee consisting of the State and Territory Radiation Control Officers and representatives of Commonwealth departments and agencies, including the NSB. The committee is considering the revision of the codes of practice relating to radiation protection and the management of radioactive waste from the mining and milling of radioactive ores, and the safe transport of radioactive substances.

The NSB is also a member of the Commonwealth/State Consultative Committee on the Management of Radioactive Waste. This committee, which is administered by the Department of Primary Industries and Energy, has been established to prepare recommendations for the coordinated management in Australia of radioactive waste. The issues considered by the

NUCLEAR REGULATORY ENVIRONMENT

committee include radioactive wastes generated by ANSTO operations, and the proposed national low-level radioactive waste repository.

In addition to the national committees above, the NSB contributes to the work of the NSW EPA working party on radioactive waste. This working party was established to develop procedures for authorising licensees to dispose of radioactive waste, and consists of officers of the Radiation Control Section of the EPA, the NSB, ANSTO and representatives of licensees. The bureau provided the working party with detailed technical advice on the regulation of radioactive discharges.

ADVICE TO OTHER AGENCIES

From time to time, officers of the NSB provide lectures for ANSTO staff on radiation protection and nuclear safety. The bureau also contributed material on national regulatory infrastructures and requirements for a distance learning course in radiation protection, being prepared by ANSTO on contract to the IAEA. Fees were charged on a cost-recovery basis.

During the year, the NSB was invited to submit a tender for performing an external technical audit of the management of the Queensland Government's storage facility for low-level radioactive waste. The bureau was appointed as the external auditor and performed the audit in May 1997. Fees were charged on a cost-recovery basis.



NSB officer during an audit of the Esk low-level radioactive waste storage facility

HUMAN RESOURCES

STAFFING

Mr D I Macnab continued as Acting Director for the full year.

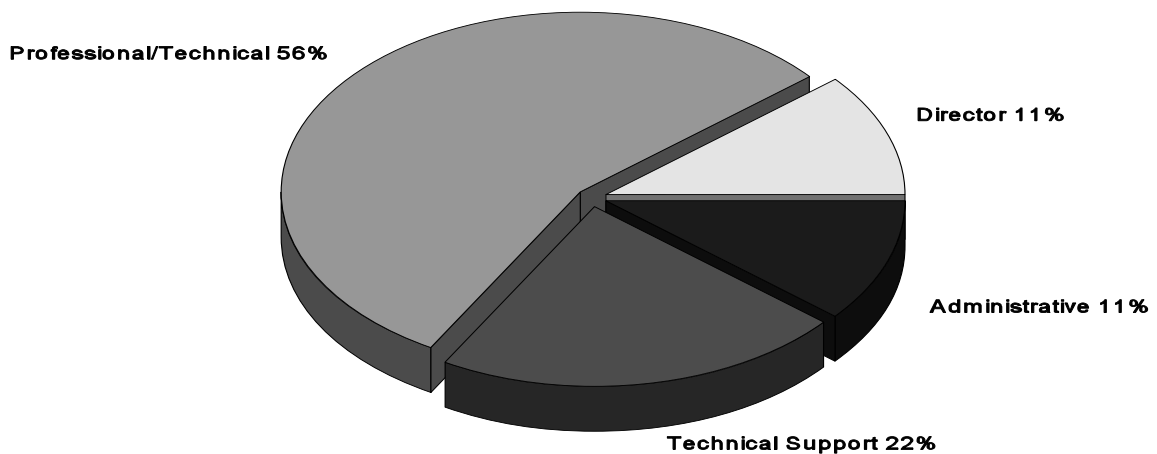
The position of Acting Director was filled from within the bureau but no recruitment action was taken at the lower level. The staffing level at 30 June 1997 totalled nine people, and consisted of the following categories of staff:

Table 5: Categories of Nuclear Safety Bureau Staff

| | Female | Male | Total |
|------------------------------|----------|----------|----------|
| Acting Director | 0 | 1 | 1 |
| Professional/Technical Staff | 0 | 5 | 5 |
| Technical Support Staff | 2 | 0 | 2 |
| Administrative Staff | 1 | 0 | 1 |
| Total | 3 | 6 | 9 |

- All employees were full-time employees.
- No staff were employed under the *Public Service Act 1922*.
- The Acting Director was a full-time holder of a Public Office, whose salary and allowances are determined by the Remuneration Tribunal.
- All employees were located at Miranda, NSW.

Figure 2: Categories of Nuclear Safety Bureau Staff



HUMAN RESOURCES

CORPORATE SERVICE FUNCTIONS

The bureau's Corporate Service personnel are responsible for the efficient operation of the administration of the NSB to ensure that it is consistent with national standards and recommendations, and international best practice. This includes the following matters:

- Develop efficient systems and continuously improve administrative practices for the bureau.
- Develop budget proposals of the bureau and advise the Director on proposals.
- Manage and control the financial expenditure of the bureau and advise management on issues concerning financial expenditure.
- Produce and distribute financial statements and the Annual Report in accordance with the Commonwealth *Audit Act 1901*.
- Provide human resource and financial services to staff.
- Establish and maintain terms and conditions of employment for bureau staff, and represent the bureau in negotiations with staff unions, associations and the Department of Industrial Relations.
- Provide advice to management on financial, staffing and resource issues.
- Arrange upkeep and maintenance of accommodation and equipment.

PERFORMANCE APPRAISAL

All officers of the bureau are required to operate within a formal performance appraisal system. This system aims to improve performance by providing the basis for assessment of individuals' achievements against preset and agreed goals. Apart from the Director, each staff member undergoes this process annually.

OCCUPATIONAL HEALTH AND SAFETY

Due to the small number of staff of the NSB, there is no requirement for a Workplace Safety Committee. However, methods for reducing risks and hazards are discussed at regular staff meetings. During the year staff attended an internal training session on Office Safety Essentials.

TRAINING

The bureau continued its commitment to being a learning organisation through long-term development and ongoing training of staff. Professional staff attended international conferences and fora both to contribute to, and keep abreast of, changes and developments in nuclear safety and regulation.

All staff participated in training courses during the year. These courses included computer applications (including Excel and Paradox), financial management, and human resources courses covering superannuation, occupational health and safety and industrial relations (including the Work Place Relations Act).

HUMAN RESOURCES

To further the long-term commitment to ensuring international best practice and continued productivity enhancement, the Director and NSB managerial staff attended management courses on leadership development, project management, strategic management and planning, and negotiation skills.

An officer completed the HIFAR Reactor Operations Engineer course at the Lucas Heights Science and Technology Centre, and attended an International Atomic Energy Agency interregional training course on Nuclear Power Plant Control and Instrumentation, to gain knowledge and experience in nuclear plant and engineering. One officer completed a Masters degree in industrial safety and the another continued a diploma in technology management. The bureau assisted with expenses incurred in undertaking these university courses.

Bureau staff participated as invited lecturers in various courses organised by ANSTO.

EQUAL EMPLOYMENT OPPORTUNITY

The bureau's EEO program has the following basic objectives:

- To establish and maintain good practice in the recruitment, selection and promotion of staff in line with the merit principle.
- To create a safe working environment that supports the rights, responsibilities and legitimate needs of all staff.
- To incorporate EEO into all strategic and management planning.
- To provide for continuing review of achievements under the program and in the context of wider Australian Public Service objectives.

Table 6: Summary of EEO Statistics at 30 June 1997

| | Numbers Employed | % of Total Staff | Average Salary |
|--------------------|-----------------------------|-------------------------|-----------------------|
| Women | 3 | 33 | \$39 682 |
| Men | 6 | 67 | \$67 208 |
| Total Staff | 9 | 100 | |

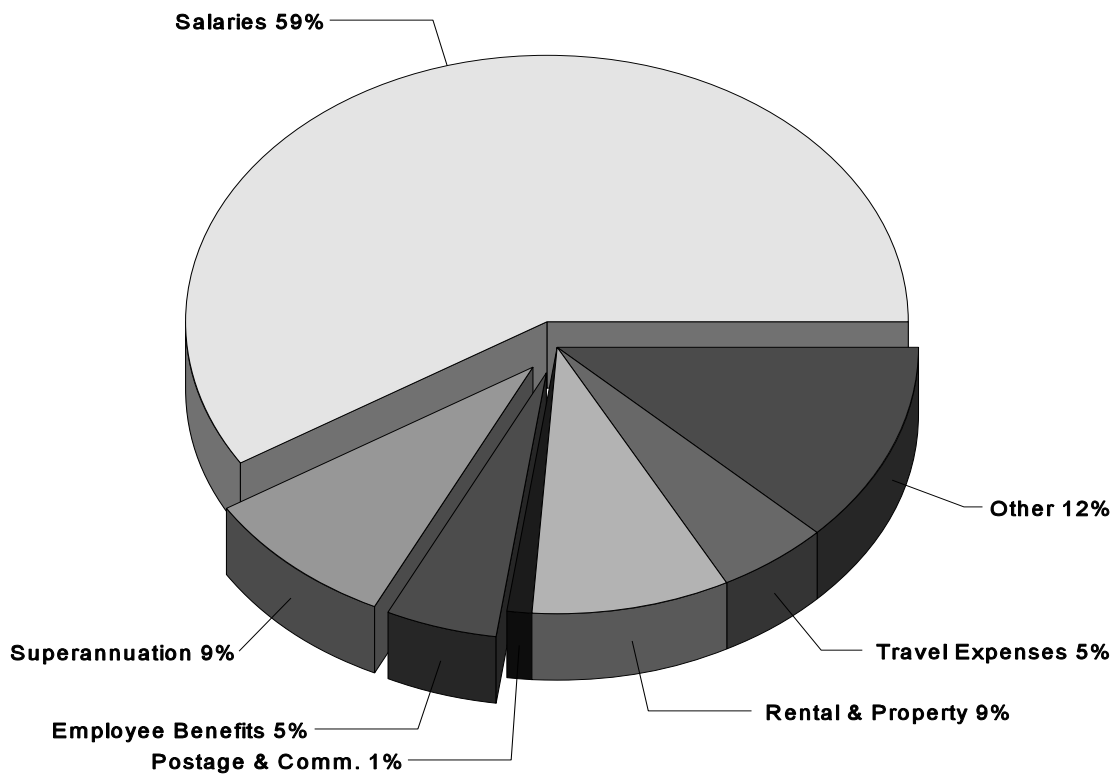
Table 7: Specific Employment Categories

| | Numbers Employed | Average Salary |
|---------------------------------------------|-------------------------|-----------------------|
| People from non-English speaking background | 1 | \$50 257 |

FINANCIAL RESOURCES

The bureau's financial statements for the year ended 30 June 1997 were audited by the Australian National Audit Office during August 1997. An unqualified audit certificate was issued by the office on 11 September 1997. As shown in the following chart, the NSB's main expenditure is on salaries, superannuation, employee benefits and rentals. The salary and related expenses accounted for 73 per cent of the total expenditure, whilst the rental expenses accounted for an additional 9 per cent. Total fixed costs for the bureau were 82 per cent of the total expenditure for the year ended 30 June 1997.

Figure 3: Nuclear Safety Bureau Expenditure Profile



FINANCIAL STATEMENTS

**NUCLEAR SAFETY BUREAU
STATEMENT BY DIRECTOR**
for the year ended 30 June 1997

In my opinion, the attached financial statements present fairly the information required by the Minister for Finance's Guidelines for Financial Statements of Commonwealth Authorities.

Signed.....

D I Macnab
Acting Director

10 September 1997

FINANCIAL STATEMENTS

NUCLEAR SAFETY BUREAU
OPERATING STATEMENT
for the year ended 30 June 1997

| | Notes | 1997 \$ | 1996 \$ |
|--------------------------------------------------------------------------------|-------|----------------|------------|
| NET COST OF SERVICES | | | |
| Operating expenses | | | |
| Employees | 3 | 657,112 | 640,672 |
| Suppliers | 2 | 244,566 | 230,626 |
| Depreciation | 4A | 16,247 | 18,685 |
| Loss on sale of Plant and Equipment | | - | 13,502 |
| Total operating expenses | | 917,925 | 903,485 |
| Operating revenues from independent sources | | | |
| Sales of Goods and Services | 5A | 9,862 | 2,875 |
| Interest | 5B | 11,889 | 10,951 |
| Total operating revenues from independent sources | | 21,751 | 13,826 |
| Net cost of services | | 896,174 | 889,659 |
| REVENUES FROM GOVERNMENT | | | |
| Revenues from government | | | |
| Parliamentary appropriations received | 6 | 889,000 | 924,000 |
| Resources received free of charge | 7 | - | 10,293 |
| Total revenues from government | | 889,000 | 934,293 |
| Surplus (deficit) of revenues from government over net cost of services | | (7,174) | 44,634 |
| Accumulated surpluses at beginning of reporting period | | 143,680 | 99,046 |
| Accumulated surpluses at end of reporting period | | 136,506 | 143,680 |

The accompanying notes form part of these financial statements.

FINANCIAL STATEMENTS

**NUCLEAR SAFETY BUREAU
STATEMENT OF ASSETS AND LIABILITIES**

As at 30 June 1997

| | Notes | 1997 \$ | 1996 \$ |
|--------------------------------------|-------|----------------|------------|
| PROVISIONS AND PAYABLES | | | |
| Employees | 9A | 194,700 | 152,456 |
| Suppliers | 9B | 27,635 | 57,354 |
| Total provisions and payables | | 222,335 | 209,810 |
| EQUITY | | | |
| Accumulated surpluses | 10 | 136,506 | 143,680 |
| Total equity | | 136,506 | 143,680 |
| Total liabilities and equity | | 358,841 | 353,490 |
| FINANCIAL ASSETS | | | |
| Cash | | 51,028 | 102,464 |
| Receivables | 11 | 45,492 | 51,992 |
| Investments | 12 | 237,738 | 152,890 |
| Total financial assets | | 334,258 | 307,346 |
| NON-FINANCIAL ASSETS | | | |
| Infrastructure, plant and equipment | 4A | 24,583 | 38,140 |
| Other | 4B | - | 8,004 |
| Total non-financial assets | | 24,583 | 46,144 |
| Total assets | | 358,841 | 353,490 |
| Current liabilities | | 46,725 | 113,552 |
| Non-current liabilities | | 175,610 | 96,258 |
| Current assets | | 334,258 | 315,350 |
| Non-current assets | | 24,583 | 38,140 |

The accompanying notes form part of these financial statements.

FINANCIAL STATEMENTS

NUCLEAR SAFETY BUREAU
STATEMENT OF CASH FLOWS
for the year ended 30 June 1997

| | Notes | 1997 \$ | 1996 \$ |
|-------------------------------------------|-------|------------------|------------|
| OPERATING ACTIVITIES | | | |
| Cash Received | | | |
| Appropriation | | 889,000 | 924,000 |
| Interest | | 11,889 | 10,951 |
| Other | | 9,862 | 2,875 |
| Total cash received | | 910,751 | 937,826 |
| Cash used | | | |
| Employees | | (657,112) | (640,672) |
| Suppliers | | (220,145) | (195,676) |
| Total cash used | | (877,257) | (836,348) |
| Net cash from operating activities | 17 | 33,494 | 101,478 |
| INVESTMENT ACTIVITIES | | | |
| Cash Received | | | |
| Term deposit | | - | 17,530 |
| Total cash received | | - | 17,530 |
| Cash used | | | |
| Term deposit | | 84,848 | - |
| Purchase of plant and equipment | | 2,690 | (26,593) |
| Total cash used | | 87,538 | (26,593) |
| Net cash from investing activities | | 87,538 | (9,063) |
| Net increase in cash held | | (51,436) | 92,414 |
| add cash at 1 July | | 102,464 | 10,050 |
| Cash at 30 June | | 51,028 | 102,464 |

The accompanying notes form part of these financial statements.

FINANCIAL STATEMENTS

**NUCLEAR SAFETY BUREAU
SCHEDULE OF COMMITMENTS**

as at 30 June 1997

| | 1997 | 1996 |
|--------------------------------|----------------|---------------|
| | \$ | \$ |
| BY TYPE | | |
| OTHER COMMITMENTS | | |
| Operating lease | 142,317 | 38,549 |
| Total other commitments | 142,317 | 38,549 |
| BY MATURITY | | |
| One year or less | 69,763 | 38,549 |
| From one to two years | 72,554 | - |
| Net commitments | 142,317 | 38,549 |

**NUCLEAR SAFETY BUREAU
SCHEDULE OF CONTINGENCIES**

as at 30 June 1997

No contingencies exist at the end of the reporting period.

The accompanying notes form part of these financial statements.

NUCLEAR SAFETY BUREAU
NOTES TO AND FORMING PART OF THE FINANCIAL STATEMENTS
for the year ended 30 June 1997

1. SUMMARY OF SIGNIFICANT ACCOUNTING POLICIES

1.1 Basis of Accounting

The Financial Statements are a general purpose financial report.

They have been prepared in accordance with

- Guidelines titled *Financial Statements of Commonwealth Authorities* issued by the Minister for Finance in July 1997 (the 'Guidelines') which require that the financial statements are prepared
 - in compliance with Australian Accounting Standards and Accounting Guidance Releases issued by the Australian Accounting Research Foundation, and
 - provisions of Part VIIA of the *Australian Nuclear Science and Technology Organisation Act 1987*, and
 - having regard to Statements of Accounting Concepts.
- The Consensus Views of the Urgent Issues Group.

The financial statements have been prepared on an accrual basis and are in accordance with historical cost convention. No allowance is made for the effect of changing prices on the results or the financial position.

1.2 Plant and Equipment

• **Cost and valuation**

All assets with a cost of less than \$1,000 are expensed in the year of acquisition except where they form a group of similar items which are significant in total.

Plant and equipment, furniture and computer software are reported at cost. The carrying values of non-current assets have been reviewed to determine whether they are in excess of their recoverable amounts. In assessing recoverable amounts, the relevant cash flows have not been discounted to their present value.

• **Depreciation**

Plant and equipment, furniture and computer software are depreciated over the estimated useful life of the asset using the straight line method of depreciation.

1.3 Cash

For the purpose of the Statement of Cash Flows, cash refers only to cash held at call with a bank.

1.4 Taxation

The bureau is exempt from all forms of taxation except fringe benefits tax.

1.5 Liability for Employee Benefits

Provision has been made for the bureau's estimated liability for long service leave entitlements for its staff. The liability represents the present value of estimated future cash flows to be made by the bureau in respect of services provided by employees up to the balance date. In determining the present value of the liability, attrition rates and pay increases through promotion and inflation have been taken into account.

A written agreement with the Australian Nuclear Science and Technology Organisation (ANSTO) exists to cover the liability for long service leave for ANSTO staff who are currently working for the Nuclear Safety Bureau and on leave without pay from ANSTO. ANSTO has agreed to accept the long service leave liability for five staff that has accrued up to 30 June 1992, a liability of \$51,992 (1996: \$51,992). The bureau has accepted the liability from 1 July 1992 onwards.

Provision is made for the bureau's estimated liability for recreation leave and leave bonus entitlements for its staff and is recognised at its nominal value.

Staff of the bureau are entitled to sick leave which accumulates with length of service and is payable upon valid claims. No provision has been made for sick leave as all sick leave is non-vesting and the average sick leave taken by employees is less than the annual entitlement for sick leave.

1.6 Leases

A distinction is made between finance leases which effectively transfer from the lessor to the lessee substantially all the risks and benefits incidental to ownership of leased assets and operating leases under which the lessor effectively retains all such risks and benefits.

Operating lease payments are charged to the Operating Statement on a basis which is representative of the pattern of benefits derived from the leased assets.

1.7 Resources Received Free of Charge

Resources received free of charge are recognised in the Operating Statement where the amounts can be reliably measured. Use of the resources is recognised as an expense.

FINANCIAL STATEMENTS

1.8 Investments

Investments are brought to account at the lower of cost or valuation.

1.9 Comparative Figures

Where necessary, comparative figures have been adjusted to conform with changes in the presentation in the current year.

2. SUPPLIERS

Supplier expenses comprised of the following:

| | 1997 | 1996 |
|----------------------------------|----------------|----------------|
| | \$ | \$ |
| Rental and Property Outgoings | 81,402 | 71,303 |
| Travel Expenses | 44,674 | 31,627 |
| Office Supplies and Stationery | 5,236 | 6,190 |
| Postage and Telecommunications | 11,412 | 12,685 |
| Training Courses, Conferences | 7,945 | 13,877 |
| Auditors' Remuneration (Note 15) | 6,000 | 6,000 |
| Consultant Fees | 13,404 | 7,113 |
| Computer Software | 34,410 | 9,686 |
| Advertising | - | 9,026 |
| Legal Services | - | 899 |
| Library Expense | 14,697 | 20,027 |
| Printing | 1,102 | 1,619 |
| Minor Assets | 398 | 1,060 |
| Vehicle Expenses | 8,205 | 7,760 |
| Library Services - ANSTO | 5,500 | 5,500 |
| Protective Services | 1,019 | 1,366 |
| Comcare | 5,172 | 10,409 |
| Insurance | 796 | 521 |
| FBT Expenses | 1,372 | 1,282 |
| Computer Maintenance | 550 | 9,283 |
| Other Expenses | 1,272 | 3,393 |
| | 244,566 | 230,626 |

FINANCIAL STATEMENTS

3. EMPLOYEE EXPENSES

| | 1997 | 1996 |
|-----------------------------------------------|----------------|----------------|
| | \$ | \$ |
| Salaries | 510,926 | 510,092 |
| Annual and Long Service Leave provided | 38,753 | 30,898 |
| Allowances | - | 8,309 |
| Senior Officers Work Related Expenses (SOWRE) | 12,020 | 15,095 |
| Superannuation Administration Fee | 1,587 | 1,586 |
| Superannuation - employer's contribution | 93,526 | 74,467 |
| Auto EFT Charges | 300 | 225 |
| | 657,112 | 640,672 |
| | 657,112 | 640,672 |

4. NON-FINANCIAL ASSETS

| <u>4A. Plant and Equipment</u> | 1997 | 1996 |
|------------------------------------|-----------------|---------------|
| | \$ | \$ |
| Office Equipment (at cost) | 56,041 | 53,351 |
| less Accumulated Depreciation | (42,340) | (33,825) |
| | 13,701 | 19,526 |
| Furniture (at cost) | 15,930 | 15,930 |
| less Accumulated Depreciation | (5,808) | (2,134) |
| | 10,122 | 13,796 |
| Computer Software (at cost) | 12,175 | 12,175 |
| less Accumulated Depreciation | (11,415) | (7,357) |
| | 760 | 4,818 |
| Total Plant and Equipment | 24,583 | 38,140 |

FINANCIAL STATEMENTS

TABLE A - Movement summary 1996-97 for all assets

| Item | Office Equipment | Furniture | Computer Software | Total Plant and Equipment |
|--------------------------------------------------------|---------------------|---------------|----------------------|---------------------------------|
| | \$ | \$ | \$ | \$ |
| Gross value as at 1 July 1996 | 53,351 | 15,930 | 12,175 | 81,456 |
| Additions: | 2,690 | 0 | 0 | 2,690 |
| Gross value as at 30 June 1997 | 56,041 | 15,930 | 12,175 | 84,146 |
| Accumulated Depreciation as at 1 July 1996 | 33,825 | 2,134 | 7,357 | 43,316 |
| Depreciation charge for assets held 1 July 1996 | 8,480 | 3,674 | 4,058 | 16,212 |
| Depreciation charge for additions | 35 | | | 35 |
| Accumulated Depreciation as at 30 June 1997 | 42,340 | 5,808 | 11,415 | 59,563 |
| Net book value as at 30 June 1997 | 13,701 | 10,122 | 760 | 24,583 |
| Net book value as at 1 July 1996 | 19,526 | 13,796 | 4,818 | 38,140 |

4B. Other Non-Financial Assets

1997

1996

\$

\$

Prepayments

-

8,004

5. OPERATING REVENUE FROM INDEPENDENT SOURCES

5A. Sale of Goods and Services

1997

1996

\$

\$

Lectures

9,862

2,875

FINANCIAL STATEMENTS

| <u>5B. Interest</u> | 1997 | 1996 |
|---------------------|---------------|--------|
| | \$ | \$ |
| Fixed Term Account | 9,949 | 9,059 |
| Operating Account | 1,940 | 1,892 |
| Total Interest | 11,889 | 10,951 |

6. PARLIAMENTARY APPROPRIATION

An appropriation of \$889,000 was made by Parliament under *Appropriation Act (No.1) 1996/97*. The Appropriation for the previous year was \$924,000.

7. RESOURCES RECEIVED FREE OF CHARGE

Last year the Department of Health and Family Services supplied computer equipment and a Gestetner printer free of charge to the bureau. These resources were valued at \$10,293.

8. SUPERANNUATION

The bureau contributes to the Commonwealth Superannuation Scheme and the Public Sector Superannuation Scheme, in accordance with Section 159 of the *Superannuation Act 1976*, to provide retirement, death and disability benefits for employees. The bureau meets its liability as costs accrue, on the basis of contribution rates set by the Australian Government Actuary. An amount of \$93,526 was contributed during the year (1995/96: \$74,467). This represents a composite contribution rate of 18% of superannuable salaries which includes the Superannuation Productivity Benefit entitlements. These schemes provide benefits in the form of lump sum payments and pensions.

9. PROVISIONS AND PAYABLES

| <u>9A. Liabilities to Employees</u> | 1997 | 1996 |
|------------------------------------------|----------------|---------|
| | \$ | \$ |
| Salaries and Wages | 5,989 | 4,644 |
| Annual Leave | 68,799 | 52,918 |
| Long Service Leave | 119,912 | 94,894 |
| Aggregate employee entitlement liability | 194,700 | 152,456 |

| <u>9B. Suppliers</u> | 1997 | 1996 |
|----------------------|---------------|--------|
| | \$ | \$ |
| Trade Creditors | 27,635 | 57,355 |

FINANCIAL STATEMENTS

10. EQUITY

| Item | Accumulated results | TOTAL EQUITY |
|-----------------------------|---------------------|----------------|
| | \$ | \$ |
| Balance 1 July 1996 | 143,680 | 143,680 |
| Surplus/(Deficit) | (7,174) | (7,174) |
| Balance 30 June 1997 | 136,506 | 136,506 |

11. RECEIVABLES

| | 1997 | 1996 |
|---------------|---------------|---------------|
| | \$ | \$ |
| Other Debtors | <u>45,492</u> | <u>51,992</u> |

12. INVESTMENTS

| | 1997 | 1996 |
|--------------|----------------|----------------|
| | \$ | \$ |
| Term Deposit | <u>237,738</u> | <u>152,890</u> |

13. REMUNERATION OF DIRECTORS

| | 1997 | 1996 |
|--------------------------------------------------------------------|----------------|----------------|
| | \$ | \$ |
| Income received or due and receivable by director(s) of the bureau | <u>113,607</u> | <u>208,071</u> |

The number of directors of the bureau included in these figures are shown below in the relevant income bands:

| | Number | Number |
|---------------------|--------|--------|
| \$110,001-\$120,000 | 1 | - |
| \$130,001-\$140,000 | - | 1 |

Amounts paid to an approved Superannuation Fund throughout the year on behalf of the director of the bureau was \$11,593 (1996: \$14,300).

FINANCIAL STATEMENTS

14. REMUNERATION OF AUDITORS

Remuneration for the audit of the bureau's financial statements performed by the Australian National Audit Office (ANAO) for the year ended 30 June 1997 was \$6,000 (1996: \$6,000). No other services were provided by the ANAO during the financial year.

15. ECONOMIC DEPENDENCY

The bureau is economically dependent on Parliamentary appropriations to perform its functions.

16. SEGMENT REPORTING

The activities of the bureau being confined to a single industry and undertaken predominantly in New South Wales make segment reporting unnecessary.

17. CASH FLOW INFORMATION

| Reconciliation of net cash flows from operating activities to Net Cost of Services | 1997 | 1996 |
|-------------------------------------------------------------------------------------------|------------------|-------------|
| | \$ | \$ |
| Net Cost of Services | (896,174) | (889,659) |
| Revenues from government | 889,000 | 934,293 |
| | <hr/> | <hr/> |
| Operating Surplus/(Deficiency) | (7,174) | 44,634 |
| (Increase)/Decrease in Plant and Equipment | (2,609) | - |
| (Increase)/Decrease in Other Non-Financial Assets | 14,504 | (46,480) |
| Increase/(Decrease) in Trade Creditors | (25,638) | 21,463 |
| Increase/(Decrease) in Other Current Liabilities | (2,734) | 26,534 |
| Increase in Employee Entitlements | 40,898 | 23,140 |
| Depreciation | 16,247 | 18,685 |
| Loss on Disposal of Plant and Equipment | - | 13,502 |
| | <hr/> | <hr/> |
| Net Cash Used by Operating Activities | 33,494 | 101,478 |
| | <hr/> <hr/> | <hr/> <hr/> |

18. RELATED PARTY DISCLOSURES

Director of the Bureau

The Director of the bureau during the year was:

D I Macnab (Acting 1/7/96 - 30/6/97)

The aggregate remuneration of Director is disclosed in Note 13.

The aggregate of superannuation payments paid to an approved Superannuation Fund in connection with the retirement of the Director was reported in Note 13.

INDEPENDENT AUDIT REPORT



**NUCLEAR SAFETY BUREAU
INDEPENDENT AUDIT REPORT**

To the Minister for Health and Family Services

Scope

I have audited the financial statements of the Nuclear Safety Bureau for the year ended 30 June 1997. The financial statements comprise:

- Statement by Director;
- Operating Statement;
- Statement of Assets and Liabilities;
- Statement of Cash Flows;
- Schedule of Commitments;
- Schedule of Contingencies; and
- Notes to and forming part of the Financial Statements.

The Director is responsible for the preparation and presentation of the financial statements and the information they contain. I have conducted an independent audit of the financial statements in order to express an opinion on them to the Minister for Health and Family Services.

The audit has been conducted in accordance with Australian National Audit Office Auditing Standards, which incorporate the Australian Auditing Standards, to provide reasonable assurance as to whether the financial statements are free of material misstatement. Audit procedures included examination, on a test basis, of evidence supporting the amounts and other disclosures in the financial statements, and the evaluation of accounting policies and significant accounting estimates. These procedures have been undertaken to form an opinion whether, in all material respects, the financial statements are presented fairly in accordance with Australian Accounting Standards, other mandatory professional reporting requirements (Urgent Issues Group Consensus Views) and statutory requirements so as to present a view of the entity which is consistent with my understanding of its financial position, the results of its operations and its cash flows.

The audit opinion expressed in this report has been formed on the above basis.

Address all mail to PO Box A456 SYDNEY SOUTH NSW 1235
130 Elizabeth Street SYDNEY NSW 2000 Phone (02)9367 7100 Fax (02)9367 7104

Audit Opinion

In accordance with sub-section 63M(2) of the Audit Act 1901, I now report that the statements are in agreement with the accounts and records of the Nuclear Safety Bureau, and in my opinion:

- (i) the statements are based on proper accounts and records;
- (ii) the statements present fairly in accordance with applicable Accounting Standards, and other mandatory professional reporting requirements, the financial position of the Nuclear Safety Bureau as at 30 June 1997 and the results of its operations and its cash flows for the year ended;
- (iii) the receipt, expenditure and investment of moneys, and the acquisition and disposal of assets, by the Nuclear Safety Bureau during the year have been in accordance with Part VIIA of the Australian Nuclear Science and Technology Organisation Act 1987; and
- (iv) the statements are in accordance with the Guidelines for Financial Statements of Commonwealth Authorities.

Australian National Audit Office



Russ Chantler
Executive Director

For the Auditor-General

Sydney
11 September 1997

OTHER RESOURCES

OTHER RESOURCES

FRAUD CONTROL

The bureau had no reported instances of fraud during the year, and therefore no cases have been referred to the Australian Federal Police, and no staff resources have been used in investigating fraud during the year. The arrangements for controls were reviewed by the Australian National Audit Office during their audit of the bureau's accounts for the year ended 30 June 1996.

CLAIMS AND LOSSES

No claims or losses were made during the year. The bureau's risk management measures included utilising the Australian Protective Services for site security during the year. As a policy, all new staff attend an Occupational Health and Safety course. Procedures have been put in place designed to minimise the risks associated with the NSB's capability to sue and be sued.

INFORMATION TECHNOLOGY PURCHASING ARRANGEMENTS

The Government's purchasing policy guidelines have been adhered to for hardware, software and services purchased from the information technology industry.

During the year, a local area network with external linkages to the Department of Human Services and Health, including the Australian Radiation Laboratory, continued to be used.

PAYMENT OF ACCOUNTS

The bureau's payment policy complies with the Commonwealth standard terms of accounts payment. During the year the following payments were processed:

| | <u>1997</u> | <u>1996</u> |
|---------------------------------------------------------------------------|-------------|-------------|
| Number of accounts received during the year | 233 | 264 |
| Number of accounts processed on or prior to the due date | 233 | 264 |
| Number of accounts received but not processed for payment during the year | 0 | 0 |

CONSULTANCY SERVICES

The bureau engaged the services of the following consultant during 1996-97:

| | |
|--------------------------------------------------------------------|-----------------|
| BR Lawrence Consulting: | |
| Provision of consultancy services for safety assessment principles | \$13,179 |

OTHER RESOURCES

PROPERTY USAGE

The bureau continued the lease on the premises at Level 3, 14–16 Central Road, Miranda, NSW which will be renewable on 1 January 2000.

EXTERNAL SCRUTINY

REPORTS BY THE AUDITOR-GENERAL

No reports by the Auditor-General relating specifically to the bureau were tabled in Parliament during the year.

FREEDOM OF INFORMATION

In compliance with Section 8 of the *Freedom of Information Act 1982*, the following information is the annual statement on consultative arrangements, categories of documents maintained and facilities and procedures for access to documents relating to the NSB. Details of the functions and decision-making powers are contained in the Annual Report.

Arrangements for External Participation

Community

NSB officers meet with the Lucas Heights liaison group, employees of the Sutherland Shire Council and community service organisations, to discuss nuclear safety matters including siting of the HIFAR research reactor, the discharge of airborne radioactive wastes and emergency arrangements at the Lucas Heights Science and Technology Centre. Quarterly and annual reports, and relevant technical reports of the bureau are provided to the council and other libraries and to community groups. Comments are sought on the bureau's nuclear safety processes and positions.

An information officer is available to address requests from the public for information concerning nuclear safety and regulation, and radiation protection.

Safety Review Committee

The Safety Review Committee oversees the safety of ANSTO's operations, including the safety of its nuclear plant. The bureau provides copies of its reports to, and meets with, the committee on a quarterly basis to review these safety aspects of ANSTO's operations.

State Government Arrangements

As a member of the Visiting Ships Panel (Nuclear), the NSB, located in NSW, liaises with State Government departments responsible for safety, in conjunction with Nuclear Powered Warship visits to Australia. An officer of the bureau is a member of a working party on radioactive waste of the NSW Environment Protection Authority's Radiation Control Section. Proposals of the NSB for the regulation of airborne radioactive discharges from HIFAR were reviewed by this working party. Other reports and documents of the bureau are regularly forwarded to State and Territory regulatory authorities for review and comment.

Commonwealth Government Arrangements

The NSB communicates with other Commonwealth Government departments and agencies, principally on nuclear safety and associated issues related with IAEA and OECD activities in connection with the bureau's functions under Section 37A(1)(c) of the *Australian Nuclear Science and Technology Organisation Act 1987*.

Categories of Documents Held

Available on Request

Copies of the bureau's quarterly reports and technical reports.

Documents Related to the Decision-making Process

Cabinet documents relating to matters in which the NSB has an interest, Ministerial correspondence, determinations and directions, memoranda and decision, deeds, legal contracts and formal arrangements, minutes and submissions, and employment, delegations, security, finance and accounting handbooks and manuals.

General Correspondence

Ministerial briefs, speeches, conference papers for national and international meetings, Parliamentary questions and answers, cables, telexes and facsimiles and general records files.

Technical Documents

Scientific and technical reports, computer discs and printouts, plant and equipment operating manuals, records of audits, inspections and reviews, maintenance, quality assurance and safety manuals, accounting records and photographs.

Health and Safety Related Documents

Staff medical records, accident reports and emergency response procedures.

Administration Documents

Personnel records including staff promotion files, organisation and establishment reports, compensation files, word processor disc systems for administrative instructions and information storage, staff lists and classifications, accounting records, payroll, flextime and overtime records, contract documents, building plans, instructions, directives, orders, memoranda, bulletins, notices and information.

Facilities for Access

Written requests for access to documents under the *Freedom of Information Act 1982* should be addressed initially to Mr D I Macnab, Acting Director, Nuclear Safety Bureau, PO Box 655, Miranda NSW 2228, Australia. The Acting Director has been appointed as an authorised officer under Section 23 of the *Freedom of Information Act 1982*.

ENABLING LEGISLATION

The *Australian Nuclear Science and Technology Organisation Amendment Act 1992* was given Royal Assent on 30 June 1992. The Principal Act is known as the *Australian Nuclear Science and Technology Organisation Act 1987*. The amendment established the functions of the bureau.

Functions of the Bureau

- 37A (1) The functions of the Bureau are:
- (a) to monitor and review the safety of any nuclear plant owned or operated by the Organisation; and
 - (b) to provide technical advice to the Commonwealth on the safety of nuclear plant and related matters; and
 - (c) such other functions as the Minister determines in writing.
- (2) A determination under paragraph (1)(c) is a disallowable instrument for the purposes of section 46A of the *Acts Interpretation Act 1901*.
- (3) The Bureau may perform its functions to the extent only that they are not in excess of the functions that may be conferred on it by virtue of any of the legislative powers of the Parliament, and, in particular, may perform its functions:
- (a) in so far as it is appropriate for those functions to be performed by the Bureau on behalf of the Government of the Commonwealth as the national Government of Australia; and
 - (b) for purposes for which it is appropriate for the Parliament as the national Parliament of Australia to authorise the Bureau to perform functions; and
 - (c) by way of expenditure of money that is available for the purposes of the Bureau in accordance with an appropriation made by the Parliament; and
 - (d) for purposes related to external affairs; and
 - (e) for purposes in or in relation to a Territory.
- (4) In this section:
- ‘**nuclear plant**’ means a nuclear reactor or assembly of fissionable material in respect of which criticality is contemplated or possible;
- ‘**nuclear reactor**’ means a facility or device, including any plant associated with such a facility or device, in which a controlled nuclear chain reaction can be maintained without an additional source of neutrons.

Powers of the Bureau

37B The Bureau has power to do all things necessary or convenient to be done for or in connection with the performance of its functions.

Restrictions on operation of nuclear plant

- 37C (1) The Bureau may, by instrument in writing given to the Organisation, impose such restrictions or conditions as the Bureau thinks appropriate on the operation of nuclear plant owned or operated by the Organisation.
- (2) In deciding whether to impose such conditions or restrictions, the Bureau must follow the procedures (if any) determined by the Minister in writing.
- (3) The Organisation must comply with any such conditions or restrictions.

Directions to Bureau

- 37D (1) Where the Minister is satisfied that it is desirable in the public interest to do so, the Minister must, by notice in writing to the Director give directions to the Bureau with respect to the performance of its functions or the exercise of its powers.
- (2) The Bureau must comply with any such directions.
- (3) The Minister must, within 15 sitting days of issuing a notice to the Director under this section, cause a copy of the notice to be tabled in each House of the Parliament.

IMPACT MONITORING

The bureau has in place energy policy and monitoring measures designed to achieve optimum energy consumption.

Purchases initiated by the NSB are evaluated to determine full-life cost and energy ratings.

GLOSSARY, ABBREVIATIONS AND ACRONYMS

| | |
|------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| ⁴¹ Ar | Argon-41 |
| ALARA | As Low As Reasonably Achievable |
| ANAO | Australian National Audit Office |
| ANSTO | Australian Nuclear Science and Technology Organisation |
| ARPANSA | Australian Radiation Protection and Nuclear Safety Agency |
| AS/NZS ISO | Australian Standard/New Zealand Standard International Standards Organisation |
| CLOUD | NSB emergency dose assessment spreadsheet |
| CNRA | Committee on Nuclear Regulatory Activities (OECD/NEA) |
| CRPPH | Committee on Radiation Protection and Public Health (OECD/NEA) |
| CSNI | Committee on the Safety of Nuclear Installations (OECD/NEA) |
| DFAT | Australian Department of Foreign Affairs and Trade |
| DIDO | Class of materials testing reactor. HIFAR (Australia), FRJ2 Jülich (Germany) and DR3 Risø (Denmark) are still operational, but DIDO, PLUTO and the Dounreay MTR in the UK have been shutdown |
| DIST | Australian Department of Industry, Science and Tourism |
| EEO | Equal Employment Opportunity |
| EFT | Electronic Funds Transfer |
| EPA | NSW Environment Protection Authority |
| FBT | Fringe Benefit Tax |
| GBq | gigabecquerel |
| HIFAR | High Flux Australian Reactor |
| IAEA | International Atomic Energy Agency |
| ICRP | International Commission on Radiological Protection (IAEA) |
| IMO | International Maritime Organisation |
| INES | International Nuclear Event Scale (IAEA) |
| INSAG | International Nuclear Safety Advisory Group (IAEA) |
| KINS | Korean Institute of Nuclear Safety |
| LHSTC | Lucas Heights Science and Technology Centre |
| MBq | megabecquerel |
| mSv | millisievert |
| NEA | Nuclear Energy Agency (OECD) |
| NHMRC | National Health and Medical Research Council |
| NPW | Nuclear Powered Warship |
| NRC | Nuclear Regulatory Commission (USA) |
| NRU | Canadian research reactor built in the 1950s |
| NSB | Nuclear Safety Bureau (Australia) |
| NSW | New South Wales |
| OECD | Organisation for Economic Co-operation and Development |
| PLG Inc | US consulting company on PSA, part of Princeton Resource Associates |
| PSA | Probabilistic Safety Assessment |
| SOWRE | Senior Officers Work Related Expenses |
| TBq | terrabecquerel |
| TRANSSAC | Transport Safety Standards Advisory Committee (IAEA) |

GLOSSARY, ABBREVIATIONS AND ACRONYMS

| | |
|----------------|--------------------------------|
| VSP(N) | Visiting Ships Panel (Nuclear) |
| WHO | World Health Organisation |
| μSv | microsievert |

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