



Australian Government

Australian Radiation Protection and Nuclear Safety Agency

**REGULATORY GUIDELINE ON
REVIEW OF
PLANS AND ARRANGEMENTS**

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Version 0

PREFACE

The Australian Radiation Protection and Nuclear Safety Agency (ARPANSA) is a Commonwealth agency created under the *Australian Radiation Protection and Nuclear Safety Act 1998* (the Act). The object of the Act is to protect the health and safety of people and protect the environment from the harmful effects of radiation. The office of the CEO of ARPANSA is created under the Act to perform specific functions and exercise defined powers.

One of the functions of the CEO under the Act is to regulate the use of controlled material and controlled apparatus (hereafter referred to as ‘dealings’) and activities in relation to controlled facilities (hereafter referred to as ‘conducts’) by Commonwealth entities (including contractors to Commonwealth entities). To meet this objective the CEO has implemented a regulatory framework that reflects international best practice in radiation protection and nuclear safety.

The regulatory framework consists of a licensing system together with a compliance monitoring, inspection and enforcement program. A number of regulatory guidelines are used within this framework for the assessment of licence applications and for the evaluation of compliance with legislative requirements and applicable Standards and Codes of Practice. This document is one such guideline.

Parts 1(4) and 2(4) of Schedule 3 to the *Australian Radiation Protection and Nuclear Safety Regulations 1999* (the Regulations) set out the information that may be required by the CEO in a licence application made under the Act. The information required may include ‘plans and arrangements’ describing how the applicant proposes to manage the controlled facility, controlled material or controlled apparatus to ensure the health and safety of people and protection of the environment. The plans and arrangements should contain information on: the arrangements for maintaining effective control, the safety management plan, the radiation protection plan, the radioactive waste management plan, the plan for ultimate disposal or transfer, the security plan and the emergency plan.

The CEO must be satisfied that the proposed management structures, policies, procedures and organisational arrangements described in any licence application are commensurate with the nature and extent of the risks and that the plans and arrangements establish that the proposed conduct or dealing can be safely undertaken.

Once a licence is issued and an applicant becomes a licence holder, regulation 49 requires the licence holder to comply with those plans and arrangements for managing safety that formed the basis of the application. Changes to the plans and arrangements may be made during the annual review required by regulation 50 or by seeking prior approval of the CEO under regulation 51 to make a relevant change where there is a significant implication for safety. Regulation 52 allows for a change unlikely to have significant safety implications provided the CEO is told about such changes on a quarterly basis.

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INTRODUCTION

This regulatory guideline sets out the information requirements that should be satisfactorily demonstrated in an applicant's or a licence holder's plans and arrangements. The primary users of this guideline are the CEO of ARPANSA and regulatory staff. The document may also assist applicants in the preparation of licence applications and licence holders in the review of their current plans and arrangements.

This guideline is broad ranging in its application and is intended to cover all dealings and conducts involving ionizing and non-ionizing radiation sources, prescribed radiation facilities and nuclear installations for which a licence is sought or has been issued. ARPANSA regulatory staff apply this guideline to the extent practicable and commensurate with the degree of hazard associated with the conduct or dealing.

Adherence to this guideline by applicants or licence holders is not mandatory. ARPANSA will consider other means of achieving compliance provided this can be adequately demonstrated by the applicant or licence holder.

This regulatory guideline does not provide an interpretation of the ARPANS Act or regulations or prescribed recommendations, standards, codes of practice or any other legislative requirements. Nothing contained in this guideline may be construed as having the force and effect of regulations, as relieving any licence holder from the requirements of other pertinent regulations, or as indicating that applications reviewed in accordance with this guideline will necessarily be approved for a licence issued by the CEO of ARPANSA.

In preparing this document, ARPANSA has researched international best practice in radiation protection and nuclear safety, drawing from national and international publications and experience, especially from the International Atomic Energy Agency. The separate ARPANSA document on a bibliography of regulatory and safety standards and guidance provides details and useful links.

ARPANSA regularly reviews its regulatory assessment guidelines, modifying them as required to recognise evolving international standards of best practice in radiation protection and nuclear safety.

This regulatory guideline RB-STD-15-03 is the second revision of the document formerly known as the *Expectations Guideline*, with this revision representing a significant restructuring, title change and context change to reflect that this regulatory guideline may apply to licence holders as well as applicants.

This guideline is considered a 'living' document that will further develop with time and experience in its application. Comments are welcome and should be addressed to the Director, ARPANSA Regulatory Branch.

Note:

1. No glossary of terms is provided within this guideline as the reader is referred to the current ARPANSA Glossary available at <http://www.arpansa.gov.au/pubs/glossary.pdf>.
2. No references or bibliography is provided with this regulatory guideline. Users of the guideline are referred to the current ARPANSA Bibliography of Regulatory and Safety Standards and Guidance available at <http://www.arpansa.gov.au/pubs/bibliography.pdf>.

1. EFFECTIVE CONTROL

ACCOUNTABILITY OF APPLICANT

The Licence Holder or Applicant is responsible for maintaining control over all aspects of conducts and dealings for which licences are held or sought, and for ensuring compliance with all applicable requirements of the ARPANS Act and Regulations. The Licence Holder or Applicant may authorise people to carry out certain actions and tasks associated with their responsibilities under the Act, but the Licence Holder or Applicant remains ultimately accountable.

Plans and arrangements should demonstrate:

- 1.1 Management control over conducts and dealings, that is, ability to ensure safety by directing tasks.
- 1.2 Authority to ensure that the resources and arrangements are sufficient to ensure safety of the conducts and dealings, and that they meet the requirements of the licence.
- 1.3 Authority over users to ensure that only persons authorised under a facility or source licence are permitted use the controlled facility, controlled apparatus or controlled material.
- 1.4 Sufficient safety awareness by management of conducts and dealings.

ORGANISATIONAL ARRANGEMENTS

The Licence Holder or Applicant is responsible for ensuring arrangements exist to effectively control technical, administrative and human factors associated with conducts and dealings. The arrangements should provide a clear description of the lines of communication, responsibilities and authorities, functions, duties and competencies required for all such activities.

Plans and arrangements should demonstrate:

- 1.5 An organisational structure, showing clear lines of authority and responsibility for all activities, particularly those relating to safety, training, radiation protection, operations, maintenance, modifications, quality management, radioactive waste management, security, emergency planning and emergency preparedness.
- 1.6 A communication network from management to staff, and the feedback system to management, showing how it will result in an open exchange of information at and between all levels of the organisation.
- 1.7 Defined responsibilities and lines of communication with other parts of the organisation and with external organisations, under all operating conditions.
- 1.8 Appropriate delegations in relation to operational and financial matters.
- 1.9 Deputising arrangements for key safety personnel in their absence.
- 1.10 Defined responsibilities and lines of communication relating to the control and supervision of contractors.
- 1.11 A description of the precise roles of individual positions, particularly those relating to radiation protection and nuclear safety, as defined in job descriptions, profiles or similar documents.

- 1.12 A statement of responsibilities for key safety positions and the required training, accreditation, authorisation for individuals to adequately fulfil these positions.
- 1.13 Systematic evaluation of staff performance benchmarked against achievable goals.
- 1.14 Periodic review of the adequacy of the organisational structure, including staffing and resources related to conducts and dealings.
- 1.15 Established liaison channels with ARPANSA and other statutory authorities for the purposes of considering, understanding and achieving compliance with the requirements of respective legislation, licence conditions, and any obligations of Australia under international treaties.

MANAGEMENT SYSTEMS

The Licence Holder or Applicant is responsible for ensuring that management systems, consistent with current AS/NZS ISO standards and commensurate with the type of controlled facility, controlled apparatus or controlled material, are developed, implemented and maintained.

Plans and arrangements should demonstrate:

- 1.16 Defined and documented policies relating to all conducts and dealings.
- 1.17 Documented objectives pertaining to key elements such as radiation protection, safety performance and protection of the environment.
- 1.18 Procedures to ensure that the policies are understood, implemented and reviewed at all levels of the organisation.
- 1.19 A procedure for records management and document control.
- 1.20 Documentary evidence to demonstrate the effectiveness of the management systems and arrangements for identification of non-conformity and the completion of corrective actions in a timely manner.
- 1.21 A procedure for reviewing authorisation of personnel to undertake conducts and dealings.
- 1.22 Certification of management system from Standards Australia, NATA, or equivalent.

RESOURCES

The Licence Holder or Applicant is responsible for ensuring that adequate and appropriate human, financial and material resources are provided to effectively implement the plans and arrangements for radiation protection and nuclear safety and to maintain effective control over conducts and dealings.

Plans and arrangements should demonstrate:

- 1.23 Means for identifying safety resource requirements.
- 1.24 A process for the allocation of safety related resources, including planning and evaluation.
- 1.25 A sufficient number of competent and authorised safety and operational personnel to perform allocated tasks without undue haste or pressure.
- 1.26 Sufficient funding to ensure staff have available to them the necessary training, equipment, facilities and technical infrastructure.

- 1.27 Clear requirements and delegations for the purchase of items and services related to the safety of conducts and dealings.

2. SAFETY MANAGEMENT

SAFETY CULTURE

The Licence Holder or Applicant is responsible for establishing safety as the organisation's highest priority, consistent with international best practice in radiation protection and nuclear safety and overriding, if necessary, the demands of production or project schedules.

Plans and arrangements should demonstrate:

- 2.1 Management's commitment to achieving and maintaining the highest level of safety by addressing safety in the organisation's strategic plan.
- 2.2 Management's expectations of staff in terms of values, beliefs, attitudes and practices concerning safety expressed as an official policy statement.
- 2.3 Processes for ensuring that the safety policy is provided to all staff, including contractors, and that it is read, understood and observed.
- 2.4 Regular review of the safety policy to ensure its adequacy for current and anticipated circumstances.
- 2.5 Isolation of safety responsibilities from commercial, financial or other pressures.
- 2.6 Mechanisms for staff consultation in the development and review of policies and procedures relating to safety of conducts and dealings.
- 2.7 A multi-layer (defence in depth) system of provisions for protection and safety commensurate with the magnitude and likelihood of the potential exposures involved for all conducts and dealings.
- 2.8 Defined objectives, schedules and reporting arrangements for committees established to review safety, radiation protection, security, emergency preparedness, etc.
- 2.9 Mechanisms for consultation, both within and outside the organisation (eg external representation on the safety committee).
- 2.10 Documented contractor selection criteria, including minimum requirements for safety procedures and performance.
- 2.11 The organisation uses safety improvement and safety accountability indicators that take into account such things as records of maintenance and modification, radiation doses to operations staff and abnormal event reports.
- 2.12 The contribution of human factors to accidents and other events that could give rise to exposure has been reduced as far as practicable.
- 2.13 A system of rewards and sanctions that promotes an open questioning attitude, discourages complacency, shortcuts and risk-taking, and encourages reporting of safety concerns and suggestions for improvement.
- 2.14 A process for the prompt detection and correction of non-conformance with safety policies in a manner commensurate with their importance including review and reporting of incidents, abnormal occurrences and safety breaches and the monitoring of safety trends.
- 2.15 Independent assessment and surveillance of safety attitudes and safety practices.
- 2.16 Mechanisms for communicating the outcomes of reviews, assessments and audits to staff.

ADMINISTRATIVE ARRANGEMENTS

The Licence Holder or Applicant is responsible for ensuring that the organisation has recognised its responsibility for ensuring the health and safety of people and the protection of the environment.

Plans and arrangements should demonstrate:

- 2.17 Controlled persons and visitors are provided with adequate information on the possible health risks associated with their occupational exposure.
- 2.18 Operational activities are only carried out according to approved written procedures.
- 2.19 The information contained in safety related policies and directives is disseminated to all controlled persons and visitors.
- 2.20 All contractors work under a system of safe work permits.
- 2.21 No person under the age of 16 years is subjected to occupational exposure.
- 2.22 No person under the age of 18 years is permitted to work in a controlled area unless supervised and then only for the purpose of training.
- 2.23 Female controlled persons and female visitors who are liable to enter controlled areas or supervised areas, are provided with appropriate information on:
 - the importance of notifying the *Licence Holder or Applicant* as soon as pregnancy is suspected
 - the risk of radiation exposure to the embryo or foetus
 - the risk to an infant ingesting radioactive substances in breast milk.
- 2.24 Appropriate measures are in place for when a controlled person declares that she is pregnant.
- 2.25 Appropriate measures are in place to control exposure of other special categories of controlled persons and visitors (eg exposure of persons with medical implants to non-ionizing radiation).
- 2.26 Every reasonable effort is made to provide controlled persons with suitable alternative employment in circumstances where it has been determined that the controlled person, for health reasons, may no longer continue in employment involving occupational exposure.

SAFE PREMISES, BUILDINGS AND EQUIPMENT

The Licence Holder or Applicant is responsible for ensuring that management has recognised their obligations to provide a safe working environment.

Plans and arrangements should demonstrate:

- 2.27 Design and construction of buildings to an appropriate standard.
- 2.28 Where relevant, the hazard categorisation of the building.
- 2.29 Housekeeping inspection procedures.
- 2.30 Procedures for safety approval of equipment.
- 2.31 Procedures for waste management and storage of hazardous materials (see Section 4).
- 2.32 Adequate security provision (see Section 6).
- 2.33 The provision of safe entry and exit.
- 2.34 Adequate emergency procedures (see Section 7).

COMPETENCY, TRAINING & SUPERVISION

The Licence Holder or Applicant is responsible for ensuring that arrangements are in place and implemented, for identifying and transferring the knowledge and skills needed by controlled persons to ensure that all conducts and dealings are performed or supervised by competent and authorised staff. In addition, the Licence Holder or Applicant is responsible for ensuring that visitors who may be exposed to any radiation arising from conducts and dealings receive appropriate supervision and instruction.

Plans and arrangements should demonstrate:

- 2.35 A requirement for the qualifications, knowledge, skills, experience and training of staff to be appropriate for the responsibilities allocated.
- 2.36 All activities which may affect safety are carried out under the control and supervision of competent personnel who are suitably authorised, qualified, trained and experienced.
- 2.37 Minimum qualification levels are established (including minimum education, training and work experience) for controlled persons to undertake each conduct or dealing.
- 2.38 Controlled persons possess appropriate qualification levels to safely and competently perform their duties with respect to conducts and dealings.
- 2.39 Controlled persons possess appropriate behavioural attributes to safely and competently perform their duties with respect to conducts and dealings.
- 2.40 All controlled persons and visitors who may be exposed to radiation from conducts and dealings receive appropriate training.
- 2.41 All staff receive training in radiation protection and response to emergencies before they commence their duties.
- 2.42 Training needs are identified in consultation with controlled persons and by appropriate means.
- 2.43 Training programs are based on the identified training needs.
- 2.44 Training programs include emergency procedure awareness training.
- 2.45 Training programs consist of a combination of training courses and on-the-job training.
- 2.46 Suitably qualified instructors are used throughout the training program.
- 2.47 Training courses include both theoretical and practical components where appropriate.
- 2.48 Assessment of the effectiveness of the training program is undertaken after instruction and during operations.
- 2.49 A formal accreditation process exists for the training program either by interview or written examination.
- 2.50 Successful completion of a training program is formally recognised by the issue of an accreditation certificate to the individual by the recognised examining body.
- 2.51 Following successful completion of a training program, controlled persons are authorised to perform specific functions to which their training relates.
- 2.52 Controlled persons undergo refresher training at periodic intervals or where a need is identified from interviews with those directly involved, or observation of job performance.
- 2.53 Refresher training is structured and implemented so that the desired competency is maintained.

- 2.54 The training program is regularly reviewed and updated.
- 2.55 Visitors staying for extended periods of time receive comparable training and induction to that given for controlled persons.
- 2.56 Records are kept of periodic reviews with measurable outcomes to demonstrate that:
- there is an adequate number of competent staff
 - training plans and schedules are specified for various staff categories, including retraining, to limit the risk of human error
 - appropriately qualified staff are used as instructors and supervisors.
- 2.57 Training records are retained and, as a minimum, include:
- contents of the training program
 - details of the qualifications of the supervisors and instructors
 - details of the training programs received by each controlled person or visitor
 - examination results for each training course
 - any accreditations/authorisations received by controlled persons and visitors as a result of the training program.
- 2.58 An adequate level of corporate knowledge is maintained within the organisation (eg with regard to staff retirement and resignation).

VISITORS, CONTRACTORS AND OTHER PERSONS

The Licence Holder or Applicant is responsible for ensuring that duty of care obligations have been met with regard to the safety of anyone entering a workplace where a conduct or dealing is undertaken. This includes contractors, their employees and visitors.

Plans and arrangements should demonstrate:

- 2.59 A single point of entry to the workplace where conducts or dealings are undertaken.
- 2.60 A visitor's log book maintained at the single point of entry.
- 2.61 The identification and escort at all times of visitors and others.
- 2.62 Adequate signage to prevent unauthorised entry into the workplace where the conduct or dealings are undertaken.
- 2.63 A briefing on critical safety rules for visitors entering the working environment where known hazards are present.
- 2.64 The provision of appropriate personal protective equipment.
- 2.65 A record of radiation doses recorded during a visit (see Section 3).
- 2.66 A requirement that contractors demonstrate appropriate knowledge of the workplace where conducts and dealings are undertaken, and of its safety requirements.

CONTROL OF HAZARDS

The Licence Holder or Applicant is responsible for ensuring that all hazards associated with conducts and dealings are appropriately controlled.

Plans and arrangements should demonstrate:

- 2.67 A system for the appropriate hazard categorisation of controlled facilities, controlled apparatus and controlled materials.
- 2.68 A documented hierarchy for the control of hazards which places principal reliance on engineered solutions before the institution of administrative measures or the introduction of personal protective equipment. Such demonstration would typically involve a systematic documented assessment of:
- the avoidance of exposure, where practicable
 - the isolation of sources of radiation, where practicable, through permanent or fixed shielding, containment and remote handling techniques
 - the engineering controls, such as local exhaust ventilation to remove contaminants from the workplace environment
 - the adoption of safe work practices, including methods which make appropriate use of time, distance and shielding to minimise exposure
 - where other means of controlling exposure are not practicable, the use of approved personal protective equipment.
- 2.69 A system for ensuring that operators, management, engineers, safety personnel and external consultants are involved in the hazard identification and assessment process, as appropriate.
- 2.70 A system for the internal safety review and approval of new and existing conducts and dealings (including modifications and decommissioning) by suitably qualified personnel and safety committees, with the level of review and approval being commensurate with the nature of the hazard.
- 2.71 A system for ensuring that external consultants and safety committees are involved in the internal safety review and approval, as appropriate.
- 2.72 A system to ensure that the hazards associated with conducts and dealings are reassessed, re-reviewed and re-approved at appropriate intervals and upon any changes, new information or incidents.

DEVIATIONS, ANOMALIES, INCIDENTS AND ACCIDENTS

The Licence Holder or Applicant is responsible for ensuring that arrangements are in place and are implemented for dealing with deviations, anomalies, incidents and accidents arising from conducts and dealings. The Licence Holder or Applicant is also responsible for ensuring that these arrangements are regularly reviewed and updated in accordance with international best practice.

Plans and arrangements should demonstrate:

- 2.73 Procedures for coping with reasonably foreseeable deviations where operational limits and conditions are not exceeded (eg a minor spread of contamination), anomalies (eg minor equipment failure or human factors resulting in minor breaches) and incidents (eg an event resulting in a dose to a controlled person exceeding the dose limit or a severe spread of contamination on-site).

- 2.74 A system for the internal reporting of ‘near-misses’, deviations, anomalies, incidents and other matters which may compromise radiation protection or nuclear safety.
- 2.75 A system to ensure that after reporting, appropriate action is taken to investigate the root cause and make recommendations to rectify the problems.
- 2.76 A system to ensure that recommendations made as a result of any ‘near-miss’, deviation, anomaly or incident are implemented within a specified timeframe.
- 2.77 A system for informing ARPANSA without delay of the occurrence of an incident or accident and, as soon as practicable, of its cause and consequences and of the steps taken to remedy the situation and to prevent a recurrence in compliance with the Act and Regulations.
- 2.78 A system for the regular review and updating of these systems and procedures in accordance with national and international best practice.

AUDITS AND REVIEWS

The Licence Holder or Applicant is responsible for ensuring that arrangements are in place and are implemented for the assessment of the performance of the radiation protection plan through audits and reviews to ensure compliance with the ARPANS legislation and consistency with international best practice.

Plans and arrangements should demonstrate:

- 2.79 Audits and reviews of the effectiveness and efficiency of the Radiation Protection Plan at the administrative and management level through to the operational level are scheduled and performed on a regular basis.
- 2.80 A process for the identification and correction of administrative and management problems that may prevent the effective and efficient performance of the Radiation Protection Plan is implemented and regularly reviewed.
- 2.81 The findings of reviews, assessments and internal audits are continuously incorporated into plans and arrangements to improve the standard of radiation protection at the management and operational level.

RECORDS AND REPORTING

The Licence Holder or Applicant is responsible for maintaining and retaining records relevant to health and safety information associated with conducts and dealings.

Plans and arrangements should demonstrate:

- 2.82 A record system compliant with a recognised quality system (See Section 1).
- 2.83 Specifications of the plans and arrangements for the protection of people and the environment from the harmful effects of radiation.
- 2.84 The maintenance of radiation records including:
- personal dose records and details of dose calculation methods
 - safety assessments, reviews and approvals
 - any accreditations and authorisations
 - calibration certificates and source certificates
 - standard operating procedures
 - minutes of committee meetings

- area monitoring results
 - environmental monitoring results
 - training records
 - incident and accident reports
 - incident and accident investigation reports and corrective measures taken.
- 2.85 The maintenance of relevant medical records (for example, the optical examination of controlled persons working with lasers).
- 2.86 The maintenance of injury records including:
- forms for notification of injury to the relevant government authorities
 - an injury register
 - a First Aid register
 - the use of Accident Report Forms
 - the use of Worker's Compensation Report Forms.
- 2.87 Copies of controlled person's dose and exposure records are provided to the controlled person on request and on termination of employment.
- 2.88 Records of ionising radiation doses that have been received by a controlled person, including details of monitoring results and dose calculation methods, are kept during the working life of the controlled person and afterwards for not less than 30 years after the last dose assessment and at least until the controlled person reaches, or would have reached, the age of 75 years.

3. RADIATION PROTECTION

PRINCIPLES OF RADIOLOGICAL PROTECTION

The Licence Holder or Applicant is responsible for ensuring that plans and arrangements are in place and implemented for the safe management of conducts and dealings in accordance with international best practice in radiological protection.

Plans and arrangements should demonstrate:

- 3.1 Conducts and dealings are justified, that is, they must produce a net benefit to the exposed individual or the community, taking into account social, economic and other relevant factors.
- 3.2 The normal exposure of individuals must be limited so that neither the total effective dose nor the total equivalent dose to relevant organs or tissues, caused by the possible combination of exposures from conducts and dealings, exceeds any relevant dose limit specified in the Regulations.
- 3.3 For any conduct or dealing under the Licence Holder or Applicant's control, protection and safety must be optimised so that the magnitude of individual doses, the number of people exposed and the likelihood of incurring exposures are kept As Low As Reasonably Achievable (ALARA), taking into account economic and social factors. For each radiation source, the level of radiation protection provided is optimised so that both individual and collective (normal and potential) exposures are kept ALARA .
- 3.4 The optimisation of the protection and safety measures associated with any particular conduct or dealing must be subject to dose constraints which:
 - do not exceed either the appropriate values established or agreed to by ARPANSA for such a conduct or dealing, or values which can cause the dose limits to be exceeded
 - ensure that the cumulative effects of each annual release of radiation to the environment be restricted so that the effective dose in any year to any member of the public, including people distant from the radiation source and people of future generations, is unlikely to exceed any relevant dose limit. Cumulative releases and the exposures expected to be delivered by all other relevant conducts or dealings under the Licence Holder or Applicant's control must be taken into account.
- 3.5 Exposure to non-ionizing radiation is kept below relevant exposure limits and to the lowest level that can be achieved, consistent with best practice.

RADIATION PROTECTION OFFICER

The Licence Holder or Applicant is responsible for ensuring that arrangements are implemented for a suitably qualified Radiation Protection Officer (RPO) to be appointed as appropriate, to undertake specific duties to ensure that the Licence Holder or Applicant's responsibilities for radiation protection and nuclear safety are met.

Plans and arrangements should demonstrate:

- 3.6 A RPO has been appointed if:
- the annual doses have the potential to exceed 10% of the limits prescribed in the Regulations
 - the conduct involves a controlled facility
 - the dealing involves pink, blue or green hazard category sources
- 3.7 The RPO has written authorisation from the Licence Holder or Applicant to conduct some or all of the duties of the Licence Holder or Applicant under the ARPANS legislation. Authorisation does not relieve the Licence Holder or Applicant of their responsibilities.
- 3.8 The RPO has operational duties that are clearly specified in the radiation protection plan.
- 3.9 Is competent and has appropriate qualifications which include:
- Appropriate minimum educational qualifications
 - Satisfactory completion of an approved training course in radiation protection;
 - an appropriate level of on-the-job work experience.
- 3.10 The RPO has sufficient knowledge of the ARPANS legislation and of relevant codes of safe practice, such as the NHMRC Radiation Health Series, relevant Australian Standards and other guidance material and information relevant to the duties of the RPO, to facilitate the achievement of best practice for the conduct or dealing being undertaken.
- 3.11 The RPO deputises another suitably trained controlled person or consultant to perform the duties of the RPO during periods of absence.

RADIATION SAFETY COMMITTEE

The Licence Holder or Applicant is responsible for ensuring that arrangements are implemented for a suitably qualified Radiation Safety Committee (RSC) to be appointed as appropriate, to undertake specific duties to ensure that the Licence Holder or Applicant's responsibilities for radiation protection and nuclear safety are met.

Plans and arrangements should demonstrate:

- 3.12 A RSC has been established if:
- the conduct or dealing has multiple activities involving controlled facilities, controlled apparatus and controlled material, or is spread over a number of premises
 - the annual doses of ionizing radiation from any conduct or dealing at any of the premises has the potential to exceed 10% of the limits specified in the Regulations
 - there is potential exposure to non-ionizing radiation above the limits specified in Schedule 1 of the Regulations
- 3.13 The RSC has functions that are clearly specified in the radiation protection plan.

- 3.14 The RSC acts as an administrative and consultative body that reviews the radiation protection plans and policies for all conducts and dealings within the organisation and recommends to the Licence Holder or Applicant the radiation protection policy that should be implemented.
- 3.15 The RSC is of size and membership determined by the type and size of the organisation using controlled facilities, controlled apparatus and controlled material.
- 3.16 The RSC meet at regular intervals (eg. quarterly) and hold special meetings to review important safety issues as required.
- 3.17 The RSC deputise persons for the Chairman, the Secretary/Executive Officer and the Radiation Protection Officer if any of them is unable to attend a meeting.
- 3.18 The RSC have standing orders relating to a quorum of members which would normally consist of at least one half of the committee membership including the Chairperson (or their deputy) and the Radiation Protection Officer (or their deputy).
- 3.19 The RSC have a standard agenda item for the Radiation Protection Officer to present a report on the state of radiation protection in the organisation.
- 3.20 The RSC keep minutes of the RSC meetings that should be ratified at following meetings of the RSC.
- 3.21 The RSC forward a copy of the RSC minutes to the senior management of the organisation.
- 3.22 The RSC establish and maintain a channel of communication with the Occupational Health and Safety Committee of the organisation (if one exists).
- 3.23 The RSC undertake consultation with controlled person and visitors who may be exposed to radiation in their work, and with controlled persons' representatives, where appropriate.

PLANNING AND DESIGN OF THE WORKPLACE

The Licence Holder or Applicant is responsible for ensuring that arrangements are in place and are implemented to ensure that the planning and design of any workplace where conducts and dealings are undertaken is optimised for radiation protection and that the design is in compliance with relevant national and international standards and codes.

Plans and arrangements should demonstrate:

- 3.24 The workplace has been planned and designed to ensure that:
 - Doses, including effective dose and equivalent dose, are in compliance with prescribed dose limits and are As Low As Reasonably Achievable (ALARA), economic and social factors being taken into account, and that appropriate dose constraints have been used
 - For each radiation source, the level of radiation protection provided is optimised so that both individual and collective (normal and potential) exposures are kept ALARA.
 - Exposure to ionizing radiation is in compliance with a source related dose constraint of 10% of the effective dose limits specified in Section 59 and 62 of the Regulation (or another percentage agreed with the CEO).
- 3.25 Priority is given to engineering controls (including ventilation, interlocks and shielding) to minimise reliance on administrative controls and personal protective equipment.

- 3.26 Ventilation and containment systems are designed to:
- limit, prevent and minimise the spread of contamination
 - limit and minimise the level of airborne radioactive material
 - limit and minimise airborne release to the environment
 - eliminate the need for the use of respiratory devices for routine operations
 - meet engineering specifications in accordance with national and international standards and best practice.
- 3.27 Interlocking devices, preferably of mechanical nature and failsafe in operation, are considered at the design stage and are incorporated into the equipment and design of the workplace to prevent inadvertent exposure.
- 3.28 Shielding is incorporated into the design of the workplace in accordance with the ALARA principle.
- 3.29 Appropriate monitoring instruments and area alarms are included in the design of the workplace.
- 3.30 The planning, design and construction of the workplace where conducts and dealings are undertaken is in compliance with relevant codes, standards and international best practice.
- 3.31 Arrangements are in place to ensure that for dealings involving non-ionizing radiation:
- 3.32 The workplace has been designed to ensure that exposure is always kept below relevant exposure limits to the lowest level that can be achieved, consistent with international best practice.
- 3.33 The planning, design and construction of laboratories undertaking any dealing is in compliance with relevant codes and standards.

CLASSIFICATION OF WORK AREAS

The Licence Holder or Applicant is responsible for ensuring that arrangements are in place for the classification of work areas associated with conducts and dealings involving ionizing radiation in accordance with ARPANS legislation, national and international standards and codes.

Plans and arrangements should demonstrate:

- 3.34 Areas are classified as controlled areas wherever specific protective measures or safety measures are or could be required for:
- Controlling normal exposures or preventing the spread of contamination during normal working conditions
 - Preventing or limiting the extent of potential exposures
 - Areas are classified as controlled areas where there is potential for significant internal exposure from surface or airborne contamination.
- 3.35 Areas are classified as controlled areas where the potential exists for significant dose rates.
- 3.36 Controlled areas are delineated by physical means or, where this is not reasonably practicable, by some other suitable means.
- 3.37 Where controlled apparatus or controlled material is brought into operation or energised only intermittently or is moved from place to place, controlled areas are delineated by means that are appropriate under the prevailing circumstances.

- 3.38 Suitable warning symbols and appropriate instructions are displayed at access points and other appropriate locations within controlled areas.
- 3.39 Appropriate occupational protection and safety measures are established for each controlled area, including the provision of local rules and procedures.
- 3.40 Access to controlled areas is restricted by means of administrative procedures (such as the use of work permits) and by physical barriers (which could include locks or interlocks), the degree of restriction being commensurate with the magnitude and likelihood of the expected exposures.
- 3.41 The following items are provided, as appropriate, at entrances to controlled areas:
- protective clothing and equipment
 - monitoring equipment
 - suitable storage for personal clothing.
- 3.42 The following items are provided, as appropriate, at exits from controlled areas:
- equipment for monitoring for contamination of skin and clothing
 - equipment for monitoring for contamination of any object or substance being removed from the area
 - washing or showering facilities
 - suitable storage for contaminated protective clothing and equipment.
- 3.43 Conditions are periodically reviewed to determine any need to revise the protection measures or safety provisions, or the boundaries of controlled areas.
- 3.44 Any area not already designated as a controlled area but where occupational exposure conditions need to be kept under review (even though specific protection measures and safety provisions are not normally needed) is designated as a supervised area.
- 3.45 Supervised areas are delineated by suitable means taking into account the nature and extent of radiation hazards in the supervised areas.
- 3.46 Appropriate warning signs are displayed at appropriate access points to supervised areas.
- 3.47 The conditions are periodically reviewed to determine any need for protective measures, safety provisions, changes to the boundaries of supervised areas, or reclassification of areas.

LOCAL RULES AND PROCEDURES

The Licence Holder or Applicant is responsible for ensuring that local rules and procedures are in place and are implemented to provide an adequate level of protection, safety and supervision for controlled persons and visitors.

Plans and arrangements should demonstrate:

- 3.48 Local rules include a description of the procedures to be followed on entering and exiting controlled and supervised areas.
- 3.49 Local rules include a description of the level of conduct to be observed in controlled and supervised areas (eg prohibition of smoking, eating, drinking etc).
- 3.50 Local rules exist which define the person responsible for radiation safety and describe the emergency procedures in the event of an incident or accident.
- 3.51 Local rules and procedures exist and are implemented for the accountability of sources.

- 3.52 Local rules and procedures exist to ensure that criticality assessments are performed where appropriate.
- 3.53 Local rules and procedures exist and are implemented for housekeeping and maintenance programs.
- 3.54 Local rules and procedures exist and are implemented for individual and workplace monitoring programs.
- 3.55 Local rules and procedures exist and are implemented to ensure that all monitoring instruments (including area alarms) are operational and appropriately calibrated.
- 3.56 Controlled apparatus and controlled materials are adequately labelled.
- 3.57 Standard operating procedures are prepared and adhered to for all activities relating to conducts and dealings.
- 3.58 Controlled persons and visitors are made aware of the local rules and procedures.
- 3.59 Local rules and procedures are reviewed and updated on a regular basis within a quality system.

PERSONAL PROTECTIVE EQUIPMENT

The Licence Holder or Applicant is responsible for ensuring that plans and arrangements are implemented for the provision of adequate and appropriate personal protective equipment.

Plans and arrangements should demonstrate:

- 3.60 Controlled persons and visitors are provided with adequate and appropriate personal protective equipment which meets relevant standards or specifications, including:
 - protective clothing
 - protective respiratory equipment for which the protection characteristics are made known to the user
 - protective aprons, gloves and organ shields.
- 3.61 Controlled persons and visitors receive adequate instruction in the proper use of respiratory protective equipment, where appropriate, including testing for good fit.
- 3.62 Tasks requiring the use of some specific personal protective equipment are assigned only to controlled persons who on the basis of medical advice are capable of safely sustaining the extra effort necessary.
- 3.63 All personal protective equipment is maintained in proper condition and tested at regular intervals.
- 3.64 Appropriate personal protective equipment is maintained for use in the event of intervention.

MONITORING OF THE WORKPLACE

The Licence Holder or Applicant is responsible for ensuring that plans and arrangements are in place and are implemented for regular radiation and contamination monitoring of the workplace.

Plans and arrangements should demonstrate:

- 3.65 A workplace monitoring program is established, maintained and regularly reviewed under the supervision of a Radiation Protection Officer.

- 3.66 Workplace monitoring includes, as appropriate:
- leak and wipe tests
 - external ionizing radiation levels
 - surface contamination levels
 - airborne contamination monitoring levels
 - readily accessible exposure levels for non-ionizing radiation.
- 3.67 Standard operating procedures are adhered to when workplace monitoring surveys are performed.
- 3.68 All monitoring instruments are calibrated periodically as required. The calibration of instruments should be checked prior to use.
- 3.69 Written reports are prepared following each workplace survey.
- 3.70 The written reports are referred to the Radiation Protection Officer and any non-routine occurrences are investigated and remedied where feasible.
- 3.71 Workplace survey results are analysed for trends and appropriate action is taken.
- 3.72 Records of the findings of workplace monitoring are retained and are made available to controlled persons.

MONITORING OF INDIVIDUALS

The Licence Holder or Applicant is responsible for ensuring that plans and arrangements are in place and are implemented for individual monitoring and assessment of exposure to controlled persons and visitors.

Plans and arrangements should demonstrate:

- 3.73 Individual monitoring is undertaken, where appropriate, and is adequate and feasible for any controlled person who is normally employed in a controlled area, or who occasionally works in a controlled area and may receive significant exposure.
- 3.74 Where individual monitoring is inappropriate, inadequate or not feasible, the exposure of the controlled person is assessed on the basis of the results of monitoring of the workplace and on information on the locations and duration of exposure of the controlled person.
- 3.75 The nature, frequency and precision of individual monitoring is determined with consideration of the magnitude and possible fluctuations of exposure levels and the likelihood and magnitude of potential exposures.
- 3.76 Controlled persons who enter and work in controlled and supervised areas wear appropriate dosimetry devices (eg whole body exposure dosimeters, extremity exposure dosimeters, direct reading dosimeters, personal air samplers).
- 3.77 Visitors who enter controlled or supervised areas are accompanied by a controlled person, each of whom wear a direct reading dosimeter.
- 3.78 Dosimetry devices are worn in the correct location and manner.
- 3.79 Controlled persons and visitors who may be exposed to radioactive contamination are identified and appropriately monitored (eg by bioassay and whole body monitoring) to demonstrate the effectiveness of the protection provided and to assess the intake of radioactive substances or the committed doses.
- 3.80 Equivalent, effective and collective doses received by controlled persons and visitors are assessed and collated.

- 3.81 Individual and collective doses are monitored and reviewed on a regular basis by the Radiation Protection Officer and/or Radiation Safety Committee.
- 3.82 Abnormal dose results are reported and investigated and actions are taken to avoid recurrence.
- 3.83 Exposures to non-ionizing radiation received by controlled persons and visitors are assessed, including the determination of parameters which affect the exposure.

MONITORING OF THE ENVIRONMENT

The Licence Holder or Applicant is responsible for ensuring that plans and arrangements are in place and are implemented for the monitoring of the environment where appropriate.

Plans and arrangements should demonstrate:

- 3.84 All potential exposure pathways to the environment have been identified.
- 3.85 The level of potential exposure has been assessed for all potential exposure pathways.
- 3.86 Pathway analysis and relevant calculations are performed for each potential exposure pathway.
- 3.87 Where ongoing environmental monitoring is not considered necessary for a specific potential exposure pathway, this decision must be justified by appropriate analysis and calculations.
- 3.88 For those potential exposure pathways where exposure levels could be significant, an ongoing environmental monitoring regime is established, maintained and regularly reviewed.
- 3.89 The environmental monitoring regime complies with relevant standards and codes and is in accordance with international best practice.

TRANSPORT

The Licence Holder or Applicant is responsible for ensuring that arrangements are implemented for the safe transport of controlled apparatus and controlled material, both on and off site, in compliance with the ARPANS legislation and international standards and codes.

Plans and arrangements should demonstrate:

- 3.90 All controlled apparatus and controlled material, on and off site, is transported in compliance with the *Code Of Practice Safe Transport Of Radioactive Material 2001*.
- 3.91 All controlled apparatus or controlled material is transported by road or rail in compliance with the *Australian Code For The Transport Of Dangerous Goods By Road Or Rail, 1997*.
- 3.92 All controlled apparatus or controlled material is transported by post in compliance with the *Postal Guide* (Australia Post, July 1990).
- 3.93 All controlled apparatus or controlled material is transported by air in compliance with the *Dangerous Goods Regulations* (International Air Transport Association; issued annually).

4. RADIOACTIVE WASTE

MANAGEMENT OF RADIOACTIVE WASTE

The Licence Holder or Applicant is responsible for ensuring that all radioactive waste (including gaseous and liquid discharges) arising from conducts and dealings, existing and anticipated, is appropriately managed. The Licence Holder or Applicant is also responsible for ensuring that appropriate plans and arrangements are in place for the safe handling, treatment, transport, storage and transfer or ultimate disposal of any such waste.

Plans and arrangements should demonstrate:

- 4.1 A description of the arrangements for the safe handling, treatment, transport, storage and ultimate transfer or disposal of any waste arising from all past, current and proposed conducts and dealings.
- 4.2 A full description of the radioactive waste (including gaseous and liquid discharges) arising from all past, current and proposed conducts and dealings.
- 4.3 A full description of all disposal pathways (including gaseous and liquid discharges) arising from all past, current and proposed conducts and dealings.
- 4.4 Documented procedures to ensure that details of any radioactive waste arising from conducts and dealings are provided to ARPANSA.
- 4.5 Documentation detailing procedures for minimisation of radioactive waste generation.
- 4.6 If fissile material is present, documentation (including calculations) to assess whether criticality is possible.
- 4.7 If criticality is possible, documentation detailing the provisions for ensuring that criticality cannot occur.
- 4.8 Compliance with the following, where appropriate:
 - the Code of Practice for the Disposal of Radioactive Wastes by the User (1985)
 - the Code of Practice for the Near Surface Disposal of Radioactive Waste in Australia (1992)
 - the Code of Practice for the Safe Transport of Radioactive Material(2001)
 - the Code of Practice on the Management of Radioactive Wastes from the Mining and Milling of Radioactive Ores (1982)
 - the requirements of appropriate statutory authorities and any local regulations (eg. Trade Waste Agreements)
- 4.9 Provisions for advising ARPANSA and relevant emergency response agencies of any occurrence which may result in gaseous or liquid discharges in excess of the licensed maximum activity levels, or in significant spillages of radioactive waste.
- 4.10 Provision to provide information to ARPANSA and relevant emergency response agencies of any loss or suspected loss of a radioactive source that might inadvertently have been included with waste for disposal.

LIMITING EXPOSURE TO RADIOACTIVE WASTE

The Licence Holder or Applicant is responsible for ensuring that exposure levels to radiation workers and members of the public are limited during the handling, treatment, transport, storage and transfer or ultimate disposal of radioactive waste.

Plans and arrangements should demonstrate:

- 4.11 Identification of all credible exposure pathways for all radioactive waste.
- 4.12 Documented procedures for how exposure is limited during handling, treatment, transport, storage and transfer or ultimate disposal of all radioactive waste.
- 4.13 Documented procedures to ensure that employees receive training and that they understand and comply with the procedures for the handling, treatment, transport, storage and transfer or ultimate disposal of all radioactive waste.
- 4.14 Provision of suitable equipment for safe handling, treatment, transport, storage and transfer or ultimate disposal of all radioactive waste.
- 4.15 Minimisation of exposure by ensuring appropriate shielding is provided and used.
- 4.16 Provision of adequate ventilation for gaseous releases during normal operation or abnormal conditions.
- 4.17 Conservative design of areas for the handling, treatment, transport, storage and transfer or ultimate disposal of radioactive waste to ensure exposure is ALARA.
- 4.18 Clearly specified limits on waste discharges for each disposal pathway based on conservative methods and modelling.
- 4.19 Documented operational procedures for monitoring and assessing results to show that discharges are within specified limits. These procedures must clearly specify the following:
 - a reference to the method used for deriving the limits for the particular discharge pathway
 - the method of keeping records to show that these limits are not exceeded
 - actions to be taken when radioactive waste discharges approach or exceed the discharge limit.
- 4.20 Documented system for demonstrating and reporting compliance with discharge limits based on the following:
 - the monitoring of discharges
 - environmental monitoring results
 - dose assessments, including independent checking of results.
- 4.21 Provision of a designated work area for the handling of unsealed radioactive waste, including:
 - a clean and well ordered working environment
 - documented procedures for each type of waste operation
 - documentation of instruction given to employees
 - clearly labelled cupboards, equipment and receptacles.
- 4.22 Documented procedures on the periodic measurement and survey of radiation levels outside any radioactive waste store.

PACKAGING AND CONTAINMENT OF RADIOACTIVE WASTE

The Licence Holder or Applicant is responsible for ensuring that radioactive waste arising from all conducts and dealings is packaged and contained so as to minimise the potential for migration or dispersion of radionuclide and to limit the external dose rate to within acceptable limits.

Plans and arrangements should demonstrate:

- 4.23 Provision of appropriate waste handling and packaging areas and facilities.
- 4.24 Documented procedures for the segregation of radioactive and non-radioactive waste.
- 4.25 Documented procedures for the segregation and packaging of radioactive waste based on radionuclide, physical form and method of storage/disposal.
- 4.26 Documented procedures to ensure that containers are clearly labelled with the radiation warning sign, a description of the radioactive contents (ie. the radionuclide and form of the waste), the activity when packaged, the date of packaging and the name of the person who is to be contacted for further information or in the event of an abnormal occurrence.
- 4.27 Documented procedures for performing and recording dose rate measurements at the surface of each package and at one metre from the surface of each package to ensure compliance with the maximum allowable dose rates.
- 4.28 Provision of non-flammable spillage trays (with 2.5 times the volume of waste) for containers of liquid waste.
- 4.29 Compliance with Annex C, Guidelines for the Packaging and Transport of Radioactive Waste of the Code of Practice for the Disposal of Radioactive Wastes by the User (1985).

INTERIM STORAGE OF RADIOACTIVE WASTE

The Licence Holder or Applicant is responsible for ensuring that all radioactive waste arising from existing and anticipated conducts and dealings which is to be stored prior to transfer or ultimate disposal is stored safely within interim stores. The Licence Holder or Applicant is also responsible for ensuring that all such interim stores are adequately sited, designed, constructed, operated, secured and maintained to allow for the optimisation of provision of safe custody of the waste packages, and for the protection of persons, property and the environment from radiological hazards associated with radioactive waste.

Plans and arrangements should demonstrate:

- 4.30 Arrangements for the siting, design, construction, operation and maintenance of all interim stores to ensure that:
 - The store is sited to minimise the impact of natural or man-made hazards.
 - The store is sited above groundwater level (where practicable) and not in a flood plain
 - The store is constructed of durable, fire resistant (2 hour fire rating) material
 - The store is conservatively designed to limit external dose rates to an acceptable level
 - The store is designed to control any contamination from gaseous or liquid releases which could conceivably occur
 - The store surfaces are constructed to allow for ease of decontamination

- There is enough space in the store for stacking, sorting and visual inspection of packages
 - The storage capacity is designed to accept at least the maximum operational holdings anticipated from the system
 - Provision is made for adequate environmental conditions in the store (heating, cooling, humidity control) to ensure proper conservation of waste packages.
 - Provision is made for cooling of heat-generating waste if there is a potential for heat-generating waste to be present
 - A documented maintenance program exists with records being kept of all maintenance
 - Appropriate radiation warning signs are displayed on each entrance to the store
 - An extraction system is present to cope with gases or vapours originating from controlled material, or for particulate material to which radioactive atoms are attached as contaminants.
- 4.31 Construction of a radioactive waste store complies with Annex E, Requirements for a Store for Radioactive Waste of the Code of Practice for the Disposal of Radioactive Wastes by the User (1985).
- 4.32 Construction of holding tanks for liquid radioactive waste comply with Annex D, Requirements for a Tank for Holding Liquid Radioactive Waste of the Code of Practice for the Disposal of Radioactive Wastes by the User (1985).
- 4.33 Radioactive waste is stored in packaging suitable for the type of storage and foreseeable timeframe of storage.
- 4.34 Documented procedures to ensure that short-lived radioactive waste is stored so as to allow the material to decay to a level at which it can be disposed of by methods such as burial, incineration or release to the sewer.
- 4.35 Documented procedures to ensure that each storage container for short-lived radioactive waste is clearly labelled with the radiation warning sign, a description of the radioactive contents, the activity when stored, the anticipated date when it may be released from the store and the name of the person responsible for placing it in the store.
- 4.36 Documented procedures for ensuring that an accurate inventory is kept of all waste packages and containers and their contents in the interim store at any time.
- 4.37 Documented procedures for the inspection, monitoring and environmental monitoring of stored radioactive waste.

DOCUMENTATION OF RADIOACTIVE WASTE

The Licence Holder or Applicant is responsible for ensuring that documentation detailing the nature of any radioactive waste arising from conducts and dealings, its location, and all safety and security procedures is maintained.

Plans and arrangements should demonstrate:

- 4.38 An adequately maintained register or database which includes, for all radioactive waste:
- the radionuclide type/content (physical, chemical and radiological characteristics)
 - the chain of custody (including details of acceptance, movement, storage, discharge and disposal)

- the waste matrix used for immobilisation
 - the treatment or conditioning method
 - the ID number of the package (ie. a unique package designator).
- 4.39 Provision for periodic review of the documented procedures and systems for the handling, transport, treatment, storage and ultimate disposal of radioactive waste.
- 4.40 Documented procedures for the maintenance of records associated with the inspection, monitoring and environmental monitoring of stored radioactive waste.
- 4.41 Provision for periodic review of effluent records.
- 4.42 Maintenance of documentation detailing any local government, State or Territory approvals and requirements which the Licence Holder or Applicant is obliged to follow.

ROUTINE DISCHARGE OF RADIOACTIVE WASTE TO THE SEWER

The Licence Holder or Applicant is responsible for ensuring that all radioactive waste arising from existing and anticipated conducts and dealings which is to be discharged to the sewer is disposed of safely.

Plans and arrangements should demonstrate:

- 4.43 A system for the discharge of liquid waste into a waste holding tank prior to disposal to the sewer (where appropriate).
- 4.44 Documented procedures to ensure that prior approval is obtained from the appropriate statutory authorities and local water authorities for the discharge of radioactive waste to the sewer.
- 4.45 Documented procedures to ensure that appropriate statutory authorities are notified, prior to disposal, of the maximum activities of each radionuclide which it is envisaged will be disposed of by this method.
- 4.46 Documented procedures to ensure that the discharge of aqueous solutions of radioactive material and macerated biological material is restricted to levels acceptable to the sewerage authorities.
- 4.47 Documented procedures to ensure that the activity of each radionuclide discharged to the approved sewerage system does not exceed twenty times the current Annual Limit on Intake by Ingestion for Workers during any period of seven days, and that any additional limits imposed by state or local water authorities are not exceeded.
- 4.48 A proposal of alternative methods of disposal for approval by the appropriate statutory authority, if the contents of the waste holding tank are found to be too active to release into the sewerage system.
- 4.49 Provision for periodic inspections of the plumbing system by a competent sewerage authority to ensure that it remains leak free.
- 4.50 Maintenance of signed records of radioactive waste discharged to sewer.

ROUTINE DISCHARGE OF RADIOACTIVE WASTE TO THE ATMOSPHERE

The Licence Holder or Applicant is responsible for ensuring that all radioactive waste arising from existing and anticipated conducts and dealings which is to be discharged to the atmosphere is disposed of safely.

Plans and arrangements should demonstrate:

- 4.51 Documented procedures to ensure prior approval for the disposal of radioactive gaseous products to the atmosphere based on provision of the following details to appropriate statutory authorities:
- design of the proposed discharge system
 - the activities, volumes and types of radionuclides likely to be discharged
 - the expected frequency of discharge
 - the meteorology of the area, especially with regard to usual wind direction and speed, and the occurrence of inversion conditions
 - the distribution of members of the public in the area
 - the proximity of inlet ducts for air conditioning systems
 - any other details that the statutory authority may require.
- 4.52 Documented procedures to ensure that appropriate statutory authorities are notified of the proposed discharge of radioactive material to the atmosphere, including the routes of discharge, prior to disposal.
- 4.53 Documented procedures to ensure that the discharge of radioactive waste to the atmosphere is restricted to levels acceptable to the appropriate statutory authorities.
- 4.54 Provision for periodic inspection of the ventilation system by a competent organisation to ensure that it remains leak free.

ROUTINE DISCHARGE OF SOLID RADIOACTIVE WASTE TO THE MUNICIPAL TIP

The Licence Holder or Applicant is responsible for ensuring that all solid radioactive waste (including animal carcasses) arising from existing and anticipated conducts and which is to be discharged to the municipal tip is disposed of safely.

Plans and arrangements should demonstrate:

- 4.55 Documentation showing that the municipal tip is approved for disposal of radioactive waste by the appropriate statutory authority.
- 4.56 Documented procedures to ensure that the maximum activity of each radionuclide included in one disposal package is below that recommended by the *Code of Practice for the Disposal of Radioactive Wastes by the User (1985)*.
- 4.57 Documented procedures to ensure that the maximum dose rate at the surface of each disposal package is less than $5 \mu\text{Sv h}^{-1}$ before the package leaves the premises.
- 4.58 Documented procedures or checklists to ensure that all relevant codes and guidelines are consulted when the radioactive waste is transported to, and disposed of at the tip.
- 4.59 Provision for obtaining prior approval from appropriate statutory authorities where waste is to be packaged differently from the guidelines in the *Code of Practice for the Disposal of Radioactive Wastes by the User (1985)*.

ROUTINE DISCHARGE OF RADIOACTIVE WASTE BY INCINERATION

The Licence Holder or Applicant is responsible for ensuring that all radioactive waste arising from existing and anticipated conducts and dealings which is to be incinerated is disposed of safely.

Plans and arrangements should demonstrate:

- 4.60 Documented procedures to ensure that only suitable radioactive wastes for incineration (including flammable solid waste, animal carcasses, vials containing organic solvents and bulk solvents) are disposed of by this method.
- 4.61 Documented procedures to ensure that glass vials with closed metal caps are not incinerated.
- 4.62 Documented procedures and appropriate calculations to demonstrate that the maximum activity of the gaseous products likely to be released to the atmosphere complies with emission standards specified by the relevant licence, approval or statutory authority prior to disposal.
- 4.63 Documented procedures for the packaging of incinerator waste in a form acceptable to the appropriate statutory authority and the incinerator operator.
- 4.64 Signed records detailing the type and activity of radionuclides disposed of by incineration

5. ULTIMATE DISPOSAL OR TRANSFER

MANAGEMENT OF ULTIMATE DISPOSAL OR TRANSFER

The Licence Holder or Applicant is responsible for ensuring that all radioactive waste (including gaseous and liquid discharges) arising from existing and anticipated conducts and dealings is ultimately disposed of or transferred in an appropriate manner. In the case of the decommissioning of controlled facilities, the Licence Holder or Applicant is responsible for the safe management of such an operation.

Plans and arrangements should demonstrate:

- 5.1 Documented procedures to ensure that details of any radioactive waste to be ultimately disposed of or transferred are provided to ARPANSA.
- 5.2 Compliance with the following where appropriate:
 - the Code of Practice for the Disposal of Radioactive Wastes by the User (1985)
 - the Code of Practice for the Near Surface Disposal of Radioactive Waste in Australia (1992)
 - the Code of Practice for the Safe Transport of Radioactive Material (2001)
 - the requirements of appropriate statutory authorities and any local regulations (eg. Trade Waste Agreements).
- 5.3 For radioactive wastes arising from mining and milling of radioactive ores, compliance with the Code of Practice on the Management of Radioactive Wastes from the Mining and Milling of Radioactive Ores (1982).
- 5.4 For facilities which are to be decommissioned, compliance with ARPANSA's 'Criteria for the decommissioning of controlled facilities' Regulatory Guideline.
- 5.5 A full description of the radioactive waste (including gaseous and liquid discharges) which is to be ultimately disposed of or transferred.
- 5.6 A description of the arrangements for the safe handling of the radioactive waste during ultimate disposal or transfer.
- 5.7 Documentation showing undertakings by other organisations to accept responsibility for controlled apparatus and controlled material when no longer required by the Applicant.
- 5.8 A provision for consultation with local government and other relevant authorities on all matters connected with ultimate disposal of controlled facilities, controlled apparatus and controlled material.

6. SECURITY

SECURITY PROCEDURES

The Licence Holder or Applicant is responsible for ensuring arrangements are made and implemented for the security of controlled facilities, controlled apparatus and controlled material, to prevent sabotage, damage, theft, loss or unauthorised use. The arrangements should include administrative and physical controls and barriers to ensure that the control of these items is not relinquished or improperly transferred, taking account of any relevant requirements imposed by the ARPANS legislation and, where applicable, the Australian Safeguards and Non-proliferation Office.

Plans and arrangements should demonstrate:

- 6.1 Clearly defined lines of responsibility for security and of authority for decision-making in matters of security of controlled facilities, controlled apparatus and controlled material.
- 6.2 Accountability, within a reasonable period of time, for all controlled facilities, controlled apparatus and controlled material in the organisation's possession.
- 6.3 Authorised personnel responsible for the storage area keys and access to use keys.
- 6.4 Appropriate access controls if controlled apparatus or controlled material are to be used off site.
- 6.5 Periodic reviews of inventories to confirm that controlled facilities, controlled apparatus and controlled material are in their designated locations and are in good external condition.
- 6.6 A documented description of staffing arrangements for providing security and responding to security threats.
- 6.7 A documented description of the selection and training of security personnel and operators (including accreditation and authorisation).
- 6.8 Routine refresher programs to ensure the skills and knowledge of personnel are current.
- 6.9 Security arrangements are compatible with emergency arrangements and the arrangements for the safety of controlled facilities, controlled apparatus, controlled material and controlled persons.
- 6.10 Records and reports include:
 - Records of inventory reviews
 - Records of any actions taken as a result of routine inspections
 - Records to log sources in and out of storage.
- 6.11 Appropriate security for storage of controlled apparatus and controlled material including:
 - Details of the storage location of the controlled apparatus and controlled material
 - A description as to the authorised use of the controlled apparatus and controlled material
 - The provision of a secure storage area for the controlled apparatus and controlled material when not in use
 - The provision of a suitable temporary storage area for controlled apparatus and controlled material in the event of off-site dealings

- The provision of a secure storage area for any radioactive waste arising from conducts and dealings which is awaiting disposal.
- 6.12 Consideration of the Design Basis Threat (DBT), in particular:
- Documented evidence that an assessment of the potential for sabotage of the controlled facility has been undertaken
 - Documented evidence that this assessment of the threat to security has been undertaken by competent persons, and that it has been used to define the DBT
 - That the Physical Protection System (PPS) to protect against the DBT includes physical barriers, access control to the plant and secure areas, surveillance systems, communication systems, and provisions for maintenance and testing of security systems.
- 6.13 Appropriate procedures and instructions, including the following:
- A listing by title of security procedures
 - Security and back-up of documentation
 - Maintenance of computer security, for example, access and changes to hardware and software.
- 6.14 Security of fissile material as required by the Australian Safeguards and Non-proliferation Office (ASNO), including:
- Appropriate selection of the Design Basis Threat and an adequate Physical Protection System (PPS) to protect against the Design Basis Threat
 - Evidence of compliance with any conditions associated with an ASNO permit.
- 6.15 Secure transport arrangements, including:
- The provision of a suitable storage container which can be locked and physically secured to the transport vehicle to prevent accidental loss, tampering or removal of controlled apparatus and controlled material by unauthorised personnel.
 - A documented system of routine checks to verify proper storage and security of the controlled apparatus and controlled material at the commencement and conclusion of transportation.
 - The maintenance of records such as shipping documents.
 - Where controlled apparatus and controlled material are transported in a vehicle owned by the organisation, the provision of routine security refresher training programs to ensure that the knowledge of the driver and operator remain current.

7. EMERGENCIES

EMERGENCY PLANS

The Licence Holder or Applicant is responsible for providing detailed emergency plans for any conduct or dealing which could give rise to a need for emergency intervention. This plan should be based on an assessment of the consequences of reasonably foreseeable accidents, and should aim to minimise the consequences and ensure the protection of on-site personnel, the public and the environment.

Plans and arrangements should demonstrate:

- 7.1 Emergency plans for any conduct or dealing which could give rise to a need for emergency intervention.
- 7.2 Identification of the various operating and other conditions which could lead to the need for intervention.
- 7.3 Identification of accident situations in terms of the hazard, the personnel at risk, and the consequences of potential accidents.
- 7.4 Classification of potential emergencies in terms of their consequences.
- 7.5 Suitable intervention and action levels are defined for the relevant protective actions taking into account the possible degrees of severity of accidents that could occur.
- 7.6 Consideration of a range of intervention measures.
- 7.7 The degree of emergency planning is commensurate with the nature and magnitude of the risk, and the feasibility of mitigating the consequences should an accident occur.
- 7.8 Responsibilities are specified for the management of interventions on-site, off-site and across state and national boundaries, as appropriate, in separate but interconnecting plans.
- 7.9 Intervening Organisations have been involved in the preparation of emergency plans as appropriate.
- 7.10 Allocation of responsibilities for notifying the relevant authorities and for initiating intervention.
- 7.11 Identification of methods and instruments for assessing the accident and its consequences on and off the site.
- 7.12 The content, features and extent of emergency plans take into account:
 - The results of any accident analysis
 - Any lessons learned from operating experience
 - Any lesson learned from accidents that have occurred with conducts or dealings of a similar type.
- 7.13 Training and retraining arrangements for personnel involved in implementing the emergency plans.
- 7.14 Arrangements for public information releases in the event of an accident.
- 7.15 Provision for the early prediction or assessment of the extent and significance of any accidental discharge of radioactive substances to the environment.
- 7.16 Provision for rapid and continuous assessment of the accident, and determine the need for protective actions as the accident proceeds.

- 7.17 Provision for dissemination of information to members of the public who could reasonably be expected to be affected by the emergency both prior to and during the emergency.
- 7.18 Provision for protection and mitigation actions, and assigned responsibilities for initiating and discharging such actions.
- 7.19 Criteria for terminating each protective action are defined.
- 7.20 Defined actions to be taken during restoration.
- 7.21 Compliance with current legislation and national and international agreements.

EMERGENCY PROCEDURES

The Licence Holder or Applicant is responsible for ensuring that comprehensive emergency procedures are prepared in accordance with the objectives of the emergency plan for any conduct or dealing which could give rise to the need for emergency intervention.

Plans and arrangements should include emergency procedures that:

- 7.22 Cover the range of emergencies that could conceivably occur.
- 7.23 Have been written for each organisational unit involved in the emergency response.
- 7.24 Have been prepared in consultation with the personnel who will be using the procedures.
- 7.25 Include a statement describing the potential emergency situation to which each procedure applies.
- 7.26 Include a statement of purpose of each procedure.
- 7.27 Include an organisational structure where the lines of authority and the functions of all individuals who will respond to an emergency are clearly defined.
- 7.28 Detail the communication arrangements for contacting any relevant on-site personnel and intervening organisations, and for obtaining assistance from fire-fighting, medical, police and any other relevant organisations.
- 7.29 Detail the actions needed both during the emergency and during restoration after the emergency including:
 - A description of appropriate intervention and action levels
 - A description of the action sequence to achieve the purpose of the procedure
 - A description of the prerequisites to the performance of the specified actions
 - Specification of the precautions and limitations during the performance of the prescribed tasks
 - Specification of guidelines to be followed in the exercise of judgement on the part of an individual, either in interpretation of results, action levels, or recommendations of protective actions.
- 7.30 Detail the initial and retraining requirements for all personnel involved in implementing the emergency plans.
- 7.31 Have been presented in a standard format within a quality system.
- 7.32 Include copies of examples of forms to be used in carrying out tasks relevant to the procedures.
- 7.33 Include sign-off sheets, checklists and data sheets to document completion of the actions prescribed in the procedures.

- 7.34 Include a list of the emergency response facilities and equipment for use in the case of an accident (including radiation monitoring instruments, sampling and counting equipment, personnel dosimeters, personal protective equipment, decontamination supplies, emergency control rooms, communication facilities, maps, facility floor plans and reference material).
- 7.35 Provide for the periodic review and updating of the procedures.
- 7.36 Include provisions for all actions related to emergency preparedness (see 7.3 – 7.43).

EMERGENCY PREPAREDNESS

The Licence Holder or Applicant is responsible for ensuring that all organisations identified in the emergency plan are prepared for such emergencies, and that adequate facilities and equipment are available and maintained.

Plans and arrangements should demonstrate:

- 7.37 An appropriate rostering system and back-up procedure is in place to ensure that emergency personnel are always available.
- 7.38 The emergency plan is exercised regularly to:
- test emergency equipment
 - test the adequacy of on-site personnel resources
 - ensure that personnel thoroughly understand their responsibilities and relationships within their organisation and at interfaces with Intervening Organisations
 - test communications and communication equipment
 - test evacuation procedures and evacuation routes
 - confirm the viability of intervention measures to protect off-site personnel and the environment
 - confirm the availability of suitable public information systems
 - confirm the availability of required external aid groups and facilities, including those for the provision of medical aid to treat injured and/or contaminated persons
 - confirm the adequacy of the interface with government, local authorities and off-site agencies.
- 7.39 The emergency plan is reviewed and updated regularly taking into consideration the results of the emergency exercises.
- 7.40 Initial training and regular retraining is carried out for personnel in each organisational unit involved in the emergency plan.
- 7.41 Emergency contact lists and procedures are regularly reviewed and updated.
- 7.42 Emergency response facilities (including suitable rooms and communication facilities) are provided and maintained.
- 7.43 Operable and calibrated monitoring and sampling equipment for use in the case of an emergency is readily available.

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