**Performance objectives and criteria for facility licence holders**

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| These Facility Performance Objectives and Criteria (FPOC) set out ARPANSA’s expectations for facility licence holders. They are based on ARPANSA’s *Regulatory Guide: Plans & Arrangements for Managing Safety* and reflect international best practice. They should be adapted and applied using a graded approach to suit the complexity of the licence holder’s operations. Regulatory Officers and licence holders should be mindful of the distinction between mandatory requirements (usually expressed as ‘must’ statements) and non-mandatory guidance (usually expressed as ‘should’ statements) and apply these appropriately.  These FPOC are used as a guide by ARPANSA inspectors when planning an inspection and to assess ongoing compliance of existing systems and arrangements against the objectives, criteria and sub-criteria as well as assessing compliance with licence conditions, applicable national codes and standards or where no national code/standard exist, with international standards such as the safety standards published by the International Atomic Energy Agency (IAEA).  ARPANSA encourages licence holders to conduct self-assessment using these FPOC. | | |
| **OBJECTIVE 1 – EFFECTIVE CONTROL**  *At all times the Responsible Person maintains effective control over facilities and any controlled apparatus or controlled material authorised under the licence*  **Principles of radiation risk management (RPS F-1)**[[1]](#footnote-2)  *Principle 1 - Clear division of responsibilities: The prime responsibility for management of radiation risks must rest with the person or organisation responsible for facilities and activities that give rise to radiation risks* | | |
| **Criteria**  With reference to P&A Guide[[2]](#footnote-3), RPS C-1(Rev.1)[[3]](#footnote-4) & POC Cross Cutter Objectives | **Sub-Criteria**  For more details refer to the relevant sections of the P&A Guide  and other documents listed in the criteria | **Observations / Comments** |
| **C1 Accountabilities & Responsibilities**  Accountabilities and responsibilities for safety and security are identified for all key functions and operations.  *P&A Guide (s1.9-1.11)*  *RPS C-1 (Rev.1) Role of the Responsible Person (s2.5)*  *RPS C-1 (Rev.1) Compliance of workers (s3.2.3)*  *RPS C-1 (Rev.1) Cooperation between Responsible Persons (s3.2.4)* | C1.1 Accountabilities and responsibilities for any function or action affecting safety are established in the plans and arrangements. In practice they are in-line with plans and arrangements for managing safety and understood and implemented in the workplace. Ultimate accountability rests with the Responsible Person (defined in RPS C-1).  C1.2 Workers know when to report, what to report and who to report to as specified in the plans and arrangements. This is demonstrated in practice.  C1.3 Reports are made in accordance with written requirements. Reports contain correct information, are issued when required and are delivered to the correct destination.  C1.4 Roles and responsibilities for groups involved in radioactive material management are defined and followed.  C1.5 Accountabilities are established, and responsibilities allocated to suitably qualified and experiences people that have authority to carry out their responsibilities.  C1.6 Accountability for safety and security is clear. Workers at all levels of an organisation understand and accept their responsibilities for safety and security. Accountabilities are documented in everyday procedures and instructions. |  |
| **C2 Management Commitment**  Management is committed to maintaining safe and secure operations and work environment.  *P&A Guide (s1.5-1.8)*  *RPS C-1 (Rev.1) Management & protection for safety (s3.1.9)* | C2.1 Top management clearly and consistently ensure that protection, safety and security are effectively integrated into the organisation’s plans and arrangements and are acted on. Examples - provision of safety and security policies/procedures, meeting minutes, monitoring of compliance with procedures, management response to event control/protection, risk appetite from interaction, observed leadership support of worker safety behaviours.  C2.2 Safety and security are clearly recognised values. The importance of safety and security is apparent in all business undertakings.  C2.3 Leadership for safety and security is clear. Leaders establish, support, and reinforce high standards of safety excellence to meet team objectives using international best practice safety standards. Leaders monitor safety and take prompt intervention at signs of declining or poor performance.  2.4 Effective control is maintained throughout the entire life cycle of controlled material and controlled apparatus for both normal, degraded, and abnormal operations (e.g., emergencies).  C2.5 The licence holder’s corporate commitment in achieving criteria C2 is understood and acted on by top management and workers. |  |
| **C3 Statutory & Regulatory Compliance**  Statutory and regulatory compliance underpins all operations.  *P&A Guide (s1.1-1.4)*  *RPS C-1 (Rev.1) Management for protection & safety (s3.1.10-11)* | C3.1 The licence holder has implemented effective processes to monitor and prevent non-compliance with the Act, Regulations and licence conditions.  C3.2 Issues with implications for safety that do not meet the threshold of statutory & regulatory compliance are investigated in the interest of continuous improvement.  C3.3 A root cause analysis or similar methodology should be applied to investigate incidents of non-compliance with significant implications for safety. |  |
| **C4 Resources**  Resources are adequately allocated and controlled.  *P&A Guide (s1.12-1.16)*  *RPS C-1 (Rev.1) Radiation Management Plan (s3.1.7)* | C4.1 The licence holder has systems in place to identify resource requirements (including financing, assets and personnel) and can demonstrate how the organisation’s resources are controlled for the purpose of safety and security. Nuclear safety, radiation protection and security are considered in the allocation of resources.  C4.2 The plans and arrangements demonstrate systems to review resource allocations if circumstances change to ensure continued safety and security of operations. Examples of the types of circumstances to be considered may be wide-ranging including responses to extreme situations such pandemics.  C4.3The licence holder uses systems to track, monitor and review resource allocations and resource risks. May include measures such as maintenance of an asset management plan to guard against erosion over time of safety systems, structure, components, equipment etc.  C4.4 The licence holder has effective systems for supply chain verification. |  |
| **C5 Communication**  Information is effectively communicated throughout the organisation.  *P&A Guide (s1.17-1.20)* | C5.1 Communication channels are in place between management, personnel, contractors and *permitted persons[[4]](#footnote-5)* on matters relevant to effective control and safety.  C5.2 The implementation of procedures and instructions match what is being communicated by leaders, management, and operational staff.  C5.3 Communication demonstrates situational awareness and teamwork to effectively support safe and secure operations.  C5.4 The reporting system and the organisation management foster open reporting. |  |
| **C6 Process Implementation**  Operations, processes, functions, and activities are adequately controlled.  *P&A Guide (s1.21-1.24)* | C6.1 Monitoring and management of safety margins - actual design and operating margins, are understood and proactively managed within the bounds of the safety case. Organisational drift is identified and managed.  C6.2 Operating staff and stakeholder consultation is included in process development and implementation.  C6.3 Process implementation is monitored and controlled. Opportunities for continuous improvement in safety are sought out and implemented.  C6.4 All processes (organisational, administrative, and practical) with implications for safety and security are carried out in accordance with written procedures. Operational documentation is used to maintain risk awareness with risks clearly documented and critical controls highlighted as appropriate. |  |
| **C7 Documentation & Document Control**  Documentation is organised and effectively managed.  *P&A Guide (Introduction and s1.25-1.30)*  *RPS C-1 (Rev.1) Record keeping (s3.1.20-24)* | C7.1 All conducts, dealings and operations with implications for safety and security are adequately documented and periodically reviewed in consultation with operational staff. Opportunities for continuous improvement in safety and security are sought out with operational staff and implemented.  C7.2 There are systems in place to ensure documents are integrated and consistent with one another. The content and quality of documents is learning driven from across the organisation.  C7.3 Documentation is accessible to all staff (including contractors if required). The documentation is meaningful, used by default and periodically reviewed.  C7.4 Changes to documentation are implemented in line with change control processes with appropriate assessments and approvals sought as applicable. |  |
| **OBJECTIVE 2 - SAFETY MANAGEMENT**  *The fundamental safety objective of protecting people and the environment from harmful effects of ionising and non-ionising radiation is achieved and is underpinned by an established and effective management system.[[5]](#footnote-6)*  **Principles of radiation risk management (RPS F-1)**  *Principle 3 - Leadership and management for safety: Effective leadership and management of radiation risks must be established and sustained in organisations concerned with, and facilities and activities that give rise to, radiation risks* | | |
| **Criteria**  With reference to P&A Guide, RPS C-1 (Rev. 1) & AS/NZS 2243.5[[6]](#footnote-7) | **Sub-Criteria**  For more details refer to the relevant sections of the P&A Guide  and other documents listed in the criteria | **Observations / Comments** |
| **C8 Safety Policy & Objectives**  Overarching policies and objectives for safety and security are clearly defined.  *P&A Guide (s2.1-2.5)*  *RPS C-1(Rev.1) Radiation Management Plan (s3.1.4)* | C8.1 A comprehensive overarching safety policy covering organisational values and behaviour expectations exists relating to all conducts and dealings. There are systems to ensure the policy will be monitored, reviewed, and kept up to date.  C8.2 The safety policy and objectives are known, understood, and adopted by workers.  C8.3 Safety and security is integrated into all activities. Considering the safety and security implications of work is a routine process which is undertaken as normal business. This routine is reinforced through organisational policies and procedures. |  |
| **C9 Risk Assessment & Mitigation**  Risks are reduced to acceptable levels by applying risk assessment and mitigation strategies.  *P&A Guide (s2.14-2.21)*  *RPS C-1 (Rev.1) Safety assessment (s3.1.17-19)*  *AS/NZS 2243.5 (s1.5.1)* | C9.1 Processes are in place to identify hazards, assess risks and develop control measures for risks that warrant mitigation. Implementation of risk mitigation measures are in accordance with change control and process implementation guidelines/procedures (see Process Implementation (C6) and Managing Change (C11)).  C9.2 Risks associated with a change are appropriately assessed holistically and systematically using suitable techniques. Frequencies for review of safety assessments and safety case is formally established as appropriate.  C9.3 Safety assurance process (nuclear, radiological, and conventional) and risk management processes are integrated within the management process.  C9.4There is a process by which safety and security data collected from monitoring and measurement is assessed. The assessment process enables safety and security data to be filtered and assessed according to the risk and used as an input to safety assessments where appropriate.  C9.5 Control measures, hazard identification, risk assessment and associated processes include management of human and organisational factor issues, e.g., work design, ergonomics, psychosocial risks, safety commitment/policies, leadership management of risk, training. |  |
| **C10 Monitoring & Measurement**  Operations are tracked, monitored, and measured.  *P&A Guide (s2.6-2.13)*  *RPS C-1(Rev.1) Prevention and mitigation of accidents (s3.1.15)*  *RPS C-1 (Rev.1) Monitoring & reporting (s3.3.3)*  *AS/NZS 2243.5 (s1.6)* | C10.1 The licence holder has in place processes used to collect and report safety data (sources of data may include near misses, incidents, accidents, exceedances, events, tests, walk-downs, assessments, dose reports, observations, reports, audits, comments, and suggestions).  C10.2 Any existing and potential hazards are identified. Managers and personnel are aware of significant potential hazards.  C10.3 The licence holder has processes in place to advocate, support and assess strong safety culture.  C10.4 The licence holder can demonstratethe process used to analyse, report, and communicate safety data to all applicable stakeholders.  C10.5 Internal safety and security reporting requirements are established and met. Deficiencies are categorised according to safety and security importance and are rectified in a timely manner.  C10.6 Independent safety and security groups - Significant safety and security performance issues (technological, organisational, and human) are managed by operationally independent groups with authority to make necessary corrective actions.  C10.7 Learning from experience is consistently applied; lessons from other facilities inside and outside the organisation are consistently communicated, evaluated and lessons from the experience are implemented. Actual organisation learning includes learning from event causes. This includes learning from events when things went right, and other good practices identified.  C10.8 The internal event reporting system is accessible by all personnel. A formal process implemented and owned by the top Executive (e.g. the CEO) for review of events and near misses and formally communicated across the organisation.  C10.9 Operating limits and conditions - Any action or condition that may result in operations beyond those normally permitted is assessed and resolved. Special attention is given to those conditions which challenge the safety limits specified in the safety case.  C10.10 Actual plant conditions and operating practices are understood and evaluated against design and operating safety margins. Actions commensurate with the risk are taken when operating margins are degraded.  C10.11 Safety management systems are clear to the staff and changes to the systems are traceable. Individual process documents ensure the relevant quality standards are met.  C10.12 The impact of reduced margins is communicated and understood by managers.  C10.13 Configuration control - Procedures are used to maintain the configuration of controlled plant and material. These controls extend to operational and security aspects.  10.14 Configuration and use of controlled plant and material is consistent with procedures, drawings, and other operational documents, including verification of manufacturers’ quality control (supply chain verification). The configuration is confirmed by routine activities which are used to detect degraded performance. |  |
| **C11 Managing Change**  Changes are safely managed.  *P&A Guide (s2.22-2.29)* | C11.1 A formal change management policy and process is in place when making changes for example to plant, equipment, operating processes, and management arrangements. Aspects to consider include (where appropriate):   * How the need and objective for change will be identified or established? * The systems or processes used to develop options to meet the change objective * How for each option the safety and security benefits, detriments and risks will be evaluated and compared? * How the preferred option(s) will be identified? * How plans to effectively implement the preferred option(s) are developed and how these plans are consistent with process implementation guidelines or instructions? * The systems or processes to ensure that the implemented change will be controlled and monitored so that safety is maintained and not degraded. * Changes are subjected to post implementation review and where appropriate, ongoing monitoring. Reviews are undertaken to determine whether implemented solutions and improvements have helped the organisation to improve safety and security performance. Where necessary, consequential changes are made to performance criteria, monitoring, and analysis processes to match the improved safety and security performance of the organisation.   C11.2 Management of change - Any changes to the licensed activity are undertaken in consideration of the safety case. The impact on nuclear safety and radiation protection safety margins is always understood.  C11.3 Changes are appropriately categorised under Regulations 63 or 64.  C11.4 Change management process for changes to systems, structures, people, and process takes due cognisance of quality, environmental, radiological, nuclear safety and workplace health and safety.  C11.5 Development and implementation of change - Design requirements, specifications and implementation plans are established for changes. The safety and security impact of alterations to the change is assessed.  C11.6 Authorisation of changes - Changes should be authorised by a leader with suitable design and operating knowledge of the controlled activity, plant, and equipment and who is not conflicted in relation to the authorisation (e.g., the design authority).  C11.7 Configuration control - Procedures are used to maintain the configuration of controlled plant and material. These controls extend to operational and security processes.  C11.8 There is a consistent method or approach to develop, approve and roll-out of new processes and operations and review of existing ones.  C11.9 Management of temporary change - The planning and management of temporary changes to a controlled activity, plant or equipment is undertaken in a similar process to permanent changes. The impact on the safety case of any temporary works, including adjacent construction, are properly assessed and managed. Examples may include the impact of construction vehicles and cranes, undermining of foundations, adjacent fire, explosion or introduced security threats.  C11.10 Internal safety review - All changes are subject to an internal safety oversight. The internal review level is determined by the safety categorisation of the change.  C11.11 Long term effectiveness - Where short-term rectifications are introduced pending a permanent change, their long-term effectiveness (useful life) is considered in in the planning and prioritising of the permanent solution.  C11.12 Post implementation review - Reviews are undertaken to establish the effectiveness of a change and of the change management process.  C11.13 Periodic review of temporary changes as appropriate is undertaken to ensure that they are still effective.  C11.14 Communication and where appropriate training to affected persons is provided of technical information relating to configuration changes (temporary and permanent). Operational workers understand the implications for safety of any configuration changes.  C11.15 The impact on the safety case of proposed or new structures, or changes in land usage around the facility are assessed. Examples may include the introduction of additional fire or explosive hazards, increase water runoff, changed airflow, increased population, etc. |  |
| **C12 Training & Education**  Staff are provided with relevant safety training and education programs.  *P&A Guide (s2.36-2.41)*  *RPS C-1 (Rev.1) Information, instruction & training (s3.2.7-10)*  *AS/NZS 2243.5 (s1.5.4)* | C12.1 Systems or processes are used to identify and determine the competency requirements for operations with safety and security implications. Established training standards and objectives are established and met.  C12.2 Safety and security positions have role and competency profiles that includes clearly defined behavioural competencies, accountabilities, ownership, and responsibilities. Senior managers determine the competencies and resource necessary to carry out the activities safely.  C12.3 Safety and security training needs for staff (and their respective role and job functions) are identified to maintain and meet competency requirements. Training is provided to workers in both technical and non-technical skills such as safety culture, human and organisational factors, leadership, communication skills and teamwork.  C12.4 Activities are conducted by suitably qualified and experienced personnel (SQEP) - the safety and security functions of positions is assessed. There are systems in place and used to ensure that key positions are filled with SQEP. Tasks of safety and security importance are competently undertaken.  C12.5 A plan, program or method exists to ensure training requirements continue to be met, such as succession-planning and refresher training. Training material, including assessment criteria are developed in accordance with the training plan. Managers approve training plans.  C12.6 General and task specific information about the health effects of radiation exposures are included in the training modules.  C12.7 There is a systematic process for developing, approving, and reviewing training to ensure it is effective and continues to reflect operational needs.  C12.8 Training records for all staff are kept up-to-date and monitored. Records cover content, attendees, and assessment results. Training status is known by workers and line management on an individual and group basis.  C12.9 Training is implemented according to a developed plan and is delivered by persons with competence in training.  C12.10 Training is regarded as a strategic issue. The process and delivery of training supports stated organisational strategies for the safety of undertakings relating to nuclear safety and radiation protection.  C12.11 Accountabilities are established that ensure training is developed and delivered in a systematic manner. Workers (including leaders and managers) understand their responsibilities for training.  C12.12 Training supports the integration of risk identification, risk assessment and contingency planning into everyday activities.  C12.13 Where appropriate Pass/Fail criteria are clearly defined for written, oral and practical examinations before the examination. Examination standards are consistent.  C12.14 There is formal selection and training processes for trainers. This requirement covers classroom and on-the-job trainers.  C12.15 Worker accreditations and authorisations are provided by line managers or above.  C12.16 On-the-job training is supported by good facilities and quality time for learning purposes.  C12.17 Training material, including any simulators, properly represents the current configuration of plant, equipment, and processes. Changes to plant, equipment and processes are quickly reflected in training.  C12.18 Training materials are up to date and regularly reviewed. Training is conducted using training materials developed.  C12.19 Managers reinforce expectations by being involved in the delivery of training as appropriate.  C12.20 Managers monitor and influence performance improvement by observing work activities and training. Managers identify and evaluate good and bad deviations from designed performance and training adjusted accordingly.  C12.21 Training reinforces expected behaviours.  C12.22 Trained workers adequately understand the job requirements that must be met. Workers demonstrate the behaviours of an engaged, thinking worker.  C12.23 Methods used to evaluate the effectiveness of training are established before training is implemented. All aspects of training programmes are evaluated. Immediate and delayed feedback on improvements is captured and used. |  |
| **C13 Learning & Continuous Improvement**  Learning from experience and continuous improvement underpin all operations.  *P&A Guide (s2.30-2.35)* | C13.1 Policies/procedures are in place to ensure learning and continuous improvement occurs for all operations (including security and emergency preparedness and response).  C13.2 There are systems, processes, or performance criteria in place to determine when operations or functions are reviewed which include learning and continuous improvement. Aspects to consider include:   * How the review takes place and who is involved are detailed? * How learning processes are identified and shared across the organisation, where applicable? * How operations and learning requirements change under different conditions (normal, degraded, emergency)? * How learnings and improvements are reflected in processes, systems, procedures, equipment, resources, and work? * How continuous improvement and learning is supported at all levels of management and through existing organisational processes? * There are feedback processes in place to ensure improvements are being implemented on the shop floor, enhancing continuous improvement.   C13.3 There is a threshold or criteria to determine when deviations from expected outcomes are investigated.  C13.4 The licence holder can demonstrate how investigations will take place and how they will be conducted. This should include the licence holder’s investigations of potential breaches as required under s57 of the Regulations.  C13.5 Investigations are conducted by personnel with relevant subject matter knowledge, experience, and competence.  C13.6 Near misses are investigated and outcomes used as learning opportunities and a culture of open reporting is fostered.  C13.7 Integration across organisational boundaries - There are systems and a willingness across the organisation to work together to improve safety. A central safety group co-ordinate this effort and has real powers of intervention to enact improvements.  C13.8 Performance requirements are defined and understood - workers understand the safety performance requirements relating to people and the controlled sources and facilities under their responsibility. When performance differs from what is expected, systems are implemented to understand and manage the deviation*.*  C13.9 Performance data is appropriately analysed - the organisation analyses reported performance data for safety and security implications. The details and reasons for deviations are understood.  C13.10 Performance improvements are planned and implemented in a timely manner - Systems are used to design and implement appropriate control measures to ensure performance is maintained or improved. Measures to improve performance are designed in consultation with workers and with regard to international best practice. Formal change management processes are applied where appropriate. |  |
| **OBJECTIVE 3 – RADIATION PROTECTION**  *The principles of radiation protection against the harmful effects of radiation and the means for achieving them are applied for all exposure situations.[[7]](#footnote-8) [[8]](#footnote-9)*  **Principles of radiation risk management (RPS F-1)**  *Principle 4 - Justification: Facilities and activities that give rise to radiation risks must yield an overall benefit*  *Principle 5 - Optimisation of protection: Protection must be optimised so that radiation risks are as low as reasonably achievable*  *Principle 6 - Limitation of risks: Measures for controlling radiation risks must ensure that no individual bears an unacceptable risk of harm, and that the environment is protected* | | |
| **Criteria**  With reference to P&A Guide, RPS C-1, AS/NZS 2243.4[[9]](#footnote-10), AS/NZS 2243.5 & IAEA SSG-10[[10]](#footnote-11) | **Sub-Criteria**  For more details refer to the relevant sections of the P&A Guide  and other documents listed in the criteria | **Observations / Comments** |
| **C14 Principles of Radiological Protection**  The fundamental principles of justification, optimisation and limitation are considered.  *P&A Guide (s3.1 - 3.7)*  *RPS C-1 (Rev.1) Application of the principles of radiation protection (s3.1.2)*  *RPS C-1 (Rev.1) Optimisation of protection & safety (s3.1.12-14)*  *AS/NZS 2243.4 (s4.1)* | C14.1 Conducts and dealings continue to be justified. The licence holder can show an ongoing net benefit to the exposed individual or the community taking into account socio-economic factors.  C14.2 Optimisation of protection requires that the likelihood of incurring exposures, the number of people exposed, and the magnitude of the exposures should be all kept as low as reasonably achievable, taking into account economic and societal factors. The level of protection should be the best under prevailing circumstances and should provide for an adequate margin of benefit over harm. Optimisation is a prospective and iterative process that requires both qualitative and quantitative judgements to be made.  C14.3 The normal exposure of individuals is limited so that neither the total effective dose nor the total equivalent dose caused by the possible combination of exposures exceeds relevant dose limits specified in the Regulations. Appropriate dose constraints are applied.  C14.4 Exposure to non-ionising radiation is kept below relevant exposure limits.  C14.5 Managers use performance improvement programs to reduce individual and collective doses to ALARA.  C14.6 Assessment of doses to the public and environment continue to consider all exposure pathways and identify critical groups. |  |
| **C15 Radiation Safety Officer**  A suitably qualified radiation safety officer (RSO) is appointed to undertake specific duties in relation to radiation protection and nuclear safety.  *P&A Guide (s3.8 - 3.10)* | C15.1 If required a RSO is appointed with sufficient knowledge of legislation, guidance etc., and their duties specified in the licence holder’s plans and arrangements.  C15.2 RSOs monitor and identify radiation hazards in the workplace.  C15.3 RSOs are involved in decision making regarding the design of the workplace and processes.  C15.4 Radiation protection specialists are used as an integral part of an operational team rather than simply a service provider. | . |
| **C16 Radiation Safety Committee**  A suitably qualified radiation safety committee (RSC) is appointed to undertake specific duties in relation to radiation protection and nuclear safety.  *P&A Guide (s3.11 - 3.22)* | C16.1 A RSC is established if required. The functions of the RSC are specified in the licence holder’s plans and arrangements.  C16.2 The RSC meets at regular intervals. The functions of the RSC should include the review of radiation protection plans and policies.  C16.3 RSC meetings should include a report from the RSO on the status of radiation protection in the organisation.  C16.4 The RSC reports to senior management and communicates with the organisation’s work health and safety committee. |  |
| **C17 Planning & Design of the Workplace**  Design of the workplace is optimised for radiation protection.  *P&A Guide (s3.23 – 3.31)*  *RPS C-1 (Rev.1) Application of the principles of radiation protection (s3.1.3)*  *RPS C-1 (Rev.1) Optimisation of protection & safety (s3.1.13)*  *AS/NZS 2243.4 (s3, s4.2 & s4.4)*  *AS/NZS 2243.5 (s1.5.2, s1.5.3)* | C17.1 The licence holder applies a hierarchy of controls to achieve risk reduction. Where reasonably achievable priority is given to engineered controls (including elimination, substitution, ventilation, interlocks and shielding) to minimise reliance on administrative controls and personal protective equipment.  C17.2 The workplace has been planned and designed to assist in ensuring that the objectives of optimisation, limitation and dose constraints are met.  C17.3 Facility and process design is supportive of safe and secure human performance - the workplace is designed to take account of the strengths and weaknesses in human performance and to maximise safety and security. Human performance is a factor considered in all stages of the design, operation, and modification of a controlled activity and is subject to regular review.  C17.4 Work areas are classified and delineated into controlled or supervised areas. Radiation areas are properly classified and visibly identified. Access controls are used to prevent unauthorised access  C17.5 Appropriate occupational protection and safety measures are established for each controlled area including the provision of local rules and procedures.  C17.6 Supervised areas are reviewed at a frequency specified in the licence holder’s plans and arrangements to determine any need for protective measures and safety provisions or changes to boundaries.  C17.7 Systems communicate the radiological status and condition of work areas to other workers and visitors before they enter a workplace. Updates are provided as necessary and promptly. |  |
| **C18 Local Rules & Procedures**  Local rules and procedures are implemented for protection and safety of workers and other persons.  *P&A Guide (s3.32)*  *AS/NZS 2243.4 (s4.4)* | C18.1 The licence holder can demonstrate the implementation of local rules and procedures that describe:  • The persons responsible for radiation safety and emergency arrangements in the event of an accident or incident  • The accountability for all sources  • Decontamination  • Calibration and maintenance of equipment   * Investigation level or authorised level and measures to be followed if any such level is exceeded.   C18.2 Criticality safety for nuclear material is adhered through the implementation of approved procedures. Criticality certificates are issued and displayed for all areas where nuclear material is handled.  C18.3 Material management controls protect the integrity of nuclear and radioactive materials from contamination and unplanned deterioration.  C18.4 Operational procedures, instructions, work permits, method statements, ALARA plans, etc. are used effectively to communicate radiation protection requirements to all workers.  C18.5 Requirements of protective practices for radiation protection, including the use of temporary shielding and PPE stated in procedures and instructions, etc. are followed.  C18.6 There is good compliance with approved procedures and instructions. | |  | | --- | |  | |  | |
| **C19 Personal Protective Equipment**  Adequate and appropriate personal protective equipment (PPE) is provided.  *P&A Guide 3.33 – 3.37)*  *RPS C-1 (Rev.1) Radiation management plan (s3.1.7)*  *AS/NZS 2243.4 (s4.8.5)* | C19.1 Controlled persons, permitted persons and visitors are provided with adequate and appropriate personal protective equipment.  C19.2 All personal protective equipment is fit for purpose, meets relevant standards, is maintained in proper condition and tested at regular intervals.  C19.3 Requirements for protective practices, including the use of shielding and PPE etc., are clearly communicated in readily available procedures, instructions, signs etc. |  |
| **C20 Monitoring of the Workplace**  Regular radiation and contamination monitoring of the workplace is conducted where appropriate.  *P&A Guide (s3.38 – 3.44)*  *RPS C-1 (Rev.1) Responsibilities of the Responsible Person for the protection of workers (s3.2.1, 3.2.2)*  *RPS C-1 (Rev.1) Assessment of occupational exposure and workers’ health (s3.2.5-6)*  *AS/NZS 2243.4 (s4.8.5, s6)*  *ARPANSA Guide Wipe Testing of Sealed Sources & use of Sealed Sources beyond recommended working life (REG-COM-SUP-270A V7.1 2019) (s2 and s3)* | C20.1 A workplace monitoring program is established, maintained, and regularly reviewed under the supervision of the RSO. Contamination surveys are undertaken outside of controlled areas to verify that contamination has not spread beyond the area boundary  C20.2 Standard operating procedures are adhered to when workplace monitoring surveys are performed.  C20.3 All monitoring instruments are calibrated as required and the calibration of instruments checked prior to use. Portable and fixed radiation Instruments are well maintained, and calibrations are up to date  C20.4 Written reports are prepared following each workplace survey and made available to controlled persons.  C20.5 Workplace survey reports are referred to persons identified in the workplace monitoring program and any unexpected deviations are investigated and appropriate action taken.  C20.6 Survey results are analysed for risks and trends (See C9 Risk Assessment and Mitigation) and are used to drive continuous improvement.  C20.7 Sealed sources are within their recommended working life and undergo wipe testing at the appropriate intervals (Re: REG-COM-SUP-270A V7.1 2019)  C20.8 Requirements for the clearance of equipment and materials from radiological controlled areas are defined and followed.  C20.9 As far as practicable, radiation areas are kept clean and free of contamination.  C20.10 Where there is a potential for contamination, monitors are used at all entry and exit points of a controlled area to verify the absence of contamination.  C20.11 Workers in contamination control workplace abide by good radiation protection hygiene practices and barrier controls. Contamination is controlled at the source.  C20.12 Workers identify radiation hot spots, and contamination and take appropriate mitigating actions.  C20.13 Workers demonstrate an ability to identify, document and correct radiological issues encountered in the workplace. Workers identify changing and unexpected radiological conditions and apply suitable mitigation. Decision making is conservative. |  |
| **C21 Inspection, Testing & Maintenance**  Inspection, Testing, and Maintenance (ITM) is undertaken in a manner which ensures the safe operation of the facility. Workers undertaking ITM are suitably qualified and experienced and demonstrate competence at all times.  *Information from reference: REG-INS-SUP-280K - December 2015.*  *IAEA SSG-10 Ageing Management for Research Reactors* | C21.1 Management systems ensure that safety and security functions are maintained through a comprehensive programme of ITM. Systems important to radiation safety are properly maintained (e.g., shielding, ventilation systems, hot cells, glove boxes and fume cupboards, filters, breathing air supplies, access controls, signs, and notices).  C21.2 Responsibilities for ITM are identified and reinforced by management.  C21.3 There are accurate procedures, instructions, specifications, drawings, etc. for ITM. Safety requirements are informed by the safety case claims and are clearly documented on formal maintenance and test schedules.  C21.4 The maintenance requirements are supported by a suitable maintenance strategy.  C21.5 Systems are implemented that ensure effective communications (including handover) on plant and equipment status within and between operations and maintenance groups.  C21.6 Arrangements are in place to ensure that work undertaken by contractors is properly supervised and meets required standards. The licence holder maintains effective ‘ownership’ of contractor-maintained equipment and fully aware of the scope of work undertaken.  C21.7 There is compliance with all ITM requirements relating to OLCs. Safety system tests are undertaken in accordance with OLCs or design authority/manufacturers recommendations. Analysis of results is undertaken, and intervention is taken on signs of declining performance.  C21.8 Maintenance and operational oversight programs are used to confirm that safety margins are not degraded, including by the drift of operating processes.  C21.9 Activities that affect the status of controlled plant or material, (e.g. maintenance and testing) is controlled to maintain acceptable safety margins at all times.  C21.10 The implications of degraded performance of systems (technological and human) is assessed for the system directly affected and for its impact on interfacing equipment, systems, and emergency response.  C21.11 Any implications for other operational areas from degraded performance is considered and communicated to corresponding managers. Managers have knowledge of such information.  C21.12 Management systems ensure that ITM work is properly authorised beforehand and documented during and after.  C21.13 ITM systems ensure that the causes of unexpected failures and performance issues are investigated. The leadership and policy areas are investigated when warranted by safety or security significance.  C21.14 ITM is conducted at the required frequency. ITM frequencies should be reviewed when equipment is found repeatedly out of specification or there is a systematic issue or a connected non-compliance. The safety consequences to safety systems found out of specification are assessed.  C21.15 Systems ensure that wide implications are considered when a single system is found repeatedly to be outside of specification.  C21.16 Priority is given to maintenance of safety functions over operational availability and production.  C21.17 Any impact on facility safety, security and EPR of temporary equipment is properly assessed. Examples include scaffold, heavy equipment, combustible, and energetic materials, electrical and communications equipment.  C21.18 Systems are in place to ensure ITM equipment is properly maintained and calibrated where applicable.  C21.19 ITM is conducted in accordance with written and approved procedures and instructions. Maintained equipment meets it design and safety and security its specifications. Special attention is given to verifying that safety functions are met.  C21.20 Workers have good situational awareness for unexpected conditions, details of which are accurately recorded and assessed for the purpose of process improvements.  C21.21 There is effective planning for ITM. Work is undertaken with the correct equipment tools and material (including specifications and drawings where appropriate).  C21.22 The correct replacement parts are used. Where an identical replacement is not available, the alternative replacement is subject to an effective equivalency evaluation.  Note: an identical replacement has the same technical and physical characteristics.  C21.23 Maintenance workers have good situational awareness and can anticipate and prevent unplanned system trips and faults associated with the work at hand.  C21.24 There is good reporting of any unexpected or abnormal conditions found during ITM. Where necessary, when faced with uncertainty or unexpected conditions, the work is safely halted to allow for advice to be sought on the best way forward.  C21.25 Tools and equipment are properly maintained and calibrated.  C21.26 Knowledge of workers - Workers have good knowledge of the processes and methods used in ITM. Workers have detailed knowledge relating to facility and worker safety and adequately understand the impact that the ITM tasks being undertaken may have.  C21.27. ITM workers have adequate understanding of the design and safety functions of the systems and components that they work on.  C21.28 ITM workers make good selection of tools and equipment in conducting their work in relation to radiation safety and understand the correct use of tools and equipment needed to conduct their work safely. The selection is based on knowledge of the abilities and limitation of the equipment.  C21.29 The requirements of configuration controls during maintenance are fully understood. Configuration and use of controlled plant and material is consistent with procedures, drawings, and other operational documents. The configuration is confirmed by routine activities which are used to detect degraded performance.  C21.30 Workers have good knowledge of current and emerging issues pertaining to ITM.  C21.31 Experience and results of ITM are used to continually evaluate program performance. ITM workers are central to optimise facility design and operation. Data from ITM tasks is used to further the understanding of system reliability and ageing.  C21.32 Performance data and observations are used to optimise ITM programmes. Maintenance personnel are engaged in this process.  C21.33 ITM workers are engaged in the planning, review and improvement of structures, systems and components and related processes.  C21.34 ITM workers are provided training to maintain and develop their skills and knowledge. |  |
| **C22 Monitoring of Individuals**  Individuals monitoring and assessment of exposure to controlled persons, permitted persons and visitors.  *P&A Guide (s3.45 - 3.56)*  *RPS C-1 (Rev.1) Application of the principles of radiation protection (s3.1.2(c)(d))*  *RPS C-1 (Rev.1) Application of the principles of radiation protection (s3.2.6)*  *RPS C1 (Rev.1) Special arrangements for protection and safety for female workers and for persons under 16 years of age (s3.2.12-13)*  *AS/NZS 2243.4 (s6)* | C22.1 Individual monitoring is undertaken where appropriate for controlled persons, permitted persons and visitors accessing a controlled area. Dosimetry is appropriate for the work undertaken  C22.2 Where individual monitoring is not required (e.g. as per guidance provided in the P&A Guide) exposure is assessed based on the results of monitoring of the workplace and on information on the locations and duration of exposure of controlled persons.  C22.3 Where personal monitoring badges are provided radiation doses received by persons are collated, assessed, and recorded.  C22.4 Individual and collective doses are monitored and reviewed on a regular basis by the RSO and RSC.  C22.5 Abnormal dose results are reported and investigated, and actions are taken to avoid recurrence. Both direct and contributing causes are subject to corrective action.  C22.6 There are detailed and accurate records for doses to workers and RP activities. Quality control is used to verify that records are correct. |  |
| **C23 Transport**  The licence holder is responsible for ensuring that arrangements are implemented for the safe transport of controlled material and controlled apparatus both on and off site.  *P&A Guide (s3.63-3.77)*  *RPS C-2 (Rev.1)*  *AS/NZS 2243.4 (s5.2)* | C23.1 Off-site transport consignments comply with national/international radioactive material and hazardous goods transport codes and regulations. Checks against RPS C-2 (Rev.1) should be performed including (inter alia):   * Radiation measurements to confirm the Transport Index * Proper completion of the Shippers Declaration Form * Correct package labelling * Correct type of transport vehicle placards and the correct positioning of placards on the vehicle.   C23.2 The RSO is be consulted in planning for on-site transport of radioactive material. |  |
| **C24 Nuclear Fuel Management Reactors Only**  Formerly BM 2.5 - Nuclear Fuel Management (Reactors Only) - Reactor Fuel is procured, operated, stored, and transported in a manner that protects its integrity and security | C24.1 The operational margin of the fuel is known and maintained. Operating and engineering personnel and management understand core characteristics and operating margins.  C24.2 Failure free fuel operations - management focus on sustaining fuel operations without failures.  C24.3 Controls are in place and effective to prevent foreign material causing damage to fuel.  C24.4 Oversight of fuel fabrication - operator oversight of fuel fabrication and pre-use inspection procedures ensure that nuclear fuel is reliable and free of defects.  C24.5 Evaluation of fuel performance - a programme of monitoring and inspection is used evaluate the effects of facility modification on the fuel. Fuel unloaded from the core is inspected to verify its integrity during use and to ensure that its integrity will be retained during storage.  C24.6 Roles and responsibilities for groups involved in fuel management and reload strategies are defined and followed. |  |
| ***OBJECTIVE 4 – RADIOACTIVE WASTE***  *A program for the management of radioactive waste is implemented that provides for the protection of people and the environment against the hazards associated with radioactive waste. The program covers administrative and operational activities involved in the handling, pre-treatment, treatment, conditioning, transport, storage, and disposal of radioactive waste.*  **Principles of radiation risk management (RPS F-1)**  *Principle 7 - Protection of present and future generations: People and the environment, present and future, must be protected against radiation risks* | | |
| **Criteria**  With reference to P&A Guide**,** RPS C-1(Rev.1), RPS C-6[[11]](#footnote-12) AS/NZS 2243.4 | **Sub-Criteria**  For more details refer to the relevant sections of the P&A Guide  and other documents listed in the criteria | **Observations / Comments** |
| **C25 Management of Radioactive Waste**  The licence holder can demonstrate that all radioactive waste (including gaseous and liquid discharges) arising from conducts and dealings, existing and anticipated, is managed.  *P&A Guide (s4.1-4.8)*  *RPS C-1 (Rev.1) Radioactive waste and discharges (s3.3.1-2)*  *AS/NZS 2243.4 (s8)* | C25.1 The licence holder’s plans and arrangements include a description of the arrangements for the handling, minimisation, segregation, treatment, transport, storage and ultimate transfer or disposal of any waste arising from all past, current, and proposed conducts and dealings.  C25.2 The plans and arrangements provide a full description of the physical, chemical, and radiological properties of the waste (including gaseous and liquid discharges) arising from all past, current, and proposed conducts and dealings. The chemical capability of the waste is known and considered.  C25.3 The licence holder makes provision for the safe handling of waste by having appropriate handling equipment and selecting methods which minimise exposure time. |  |
| **C26 Limiting Exposure to Radioactive Waste**  The licence holder is responsible for ensuring that exposure levels to radiation workers and members of the public are optimised during the handling, treatment, transport, storage and transfer or ultimate disposal of radioactive waste.  *P&A Guide (s4.9-4.12)* | C26.1 The licence holder has identified all credible exposure pathways for radioactive waste under their control.  C26.2 The licence holder’s plans and arrangements describe how exposure is limited during handling, treatment, transport, storage and transfer or ultimate disposal of all radioactive waste.  C26.3 The licence holder can demonstrate from monitoring and assessment that discharges are within specified limits. |  |
| **C27 Packaging & Containment of Radioactive Waste**  The licence holder is responsible for ensuring that radioactive waste arising from all conducts and dealings is packaged and contained to minimise the potential for migration or dispersion of radionuclide and to limit the external dose rate to within tolerable limits.  *P&A Guide (s4.13-4.16)* | C27.1 The licence holder provides appropriate waste handling and packaging areas and facilities.  C27.2 The licence holder has implemented procedures to ensure that waste containers are clearly labelled with the radiation warning signs and any details as required by AS/NZS 2243.4.  C27.3 Documented procedures for performing and recording dose rate measurements at the surface of each package/container and at one metre from the surface of each package.  C27.4 Spillage trays should be provided on which containers of liquid waste should be placed and be of sufficient capacity to contain the volume of the contents of the containers. |  |
| **C28 Storage of Radioactive Waste**  The licence holder is responsible for ensuring that all radioactive waste arising from existing and anticipated conducts and dealings is stored safely and securely.  *P&A Guide (s4.17)*  *AS/NZS 2243.4 (s5.1)* | C28.1 The licence holder ensures that all radioactive waste stores are adequately sited, constructed, and operated in accordance with relevant codes and standards. |  |
| **C29 Documentation of Radioactive Waste**  The licence holder 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.  *P&A Guide (s4.18-4.19)* | C29.1 The licence holder ensures that procedures are in place to ensure that an accurate inventory is kept of all waste packages, containers, and their contents. |  |
| **C30 Routine Discharge of Radioactive Waste to Atmosphere & the Sewer**  The licence holder is responsible for ensuring that all radioactive waste arising from existing and anticipated conducts and dealings is safely discharged.  *P&A Guide (s4.20, s4.21)*  *AS/NZS 2243.4 (s8.3, s8.4)*  *RPS C-6* | C30.1 A system is in place to ensure that any discharge of radioactive waste to the atmosphere does not exceed statutory limits.  C30.2 There are arrangements in place to ensure that the limits imposed by state or local water authorities are not exceeded.  C30.3 Holding liquid waste in tanks to allow decay prior to disposal may be required. Where required these are maintained as appropriate |  |
| **OBJECTIVE 5 – ULTIMATE DISPOSAL OR TRANSFER**  *All radioactive waste arising from existing and anticipated conducts and dealings is ultimately disposed of or transferred in an appropriate and lawful manner.*  **Principles of radiation risk management (RPS F-1)**  *Principle 7 - Protection of present and future generations: People and the environment, present and future, must be protected against radiation risks* | | |
| **Criteria**  With reference to RPS C-1 (Rev.1), P&A Guide**,** AS/NZS 2243.4, AS/NZS 2243.5 | **Sub-Criteria**  For more details refer to the relevant sections of the P&A Guide  and other documents listed in the criteria | **Observations / Comments** |
| **C31 Management of Ultimate Disposal or Transfer**  The licence holder is responsible for ensuring that all radioactive waste arising from existing and anticipated conducts and dealings is ultimately disposed of or transferred in a safe manner.  *P&A Guide (s5)*  *RPS C-1 (Rev.1) Radioactive waste and discharges (s3.3.1)*  *AS/NZS 2243.4 (s8.5)* | C31.1 The licence holder has in place procedures to ensure that:   * details of any proposed disposal or transfer of radioactive waste are maintained and provided to ARPANSA in the approved format * the requirements of appropriate statutory authorities and any local regulations are met (e.g. Trade Waste Agreements)   C31.2 The disposal/transfer procedures are shown to be effective. Accurate records are kept and are reconciled against any associated inventories of controlled sources/apparatus.  C31.3 Decommission Planning - for research reactors, radioisotope production facilities, spent fuel management facilities, relevant medical and industrial facilities and research development facilities – refer to ARPANSA Regulatory Guide, decommissioning of Controlled Facilities (ARPANSA-GDE-1731WEB). |  |

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| **OBJECTIVE 6 – SECURITY**  *Policies, plans and arrangements are made and implemented for the security of facilities and any controlled apparatus and controlled material authorised under the licence, to decrease the likelihood of unauthorised access, damage, theft, loss, or unauthorised use.*  **Principles of radiation risk management (RPS F-1)**  *Principle 8 - Prevention of accidents and malicious acts: All practical efforts must be made to prevent and mitigate accidents, and acts with malicious intent, that may give rise to radiation risks* | | |
| **Criteria**  With reference to P&A Guide, RPS-11[[12]](#footnote-13)RPS C-1 (Rev.1) | **Sub-Criteria**  For more details refer to the relevant sections of the P&A Guide  and other documents listed in the criteria | **Observations / Comments** |
| **C32 Security Procedures**  The licence holder is responsible for ensuring arrangements are made and implemented for the security of controlled apparatus and controlled material, to prevent unauthorised access, damage, theft, loss, or unauthorised use.  *P&A Guide (s6)*  *RPS C-1 (Rev.1) Aligning safety and security objectives (s2.3)* | C32.1 The licence holder’s plans and arrangements include administrative and physical controls to ensure that facilities and any controlled material and controlled apparatus authorised under the licence are secure. Accountabilities are established and responsibilities allocated to suitably qualified and experiences people that have authority to carry out their responsibilities.  C32.2 The licence holder complies with the requirements of RPS 11 as relevant to the security category of the sources involved.  C32.3 The licence holder conducts reviews of inventories (at a frequency specified in the licence holder’s plans and arrangements) to confirm the category or aggregated category of sources in their designated locations. The frequency of review is informed by a graded approach based on the category of the controlled material determined in accordance with RPS 11 (e.g. inventory checks of Category 1 sources are conducted more frequently than lower security categorised sources).  Note: sub-criteria C32.2 & C32.3 applies only to sources meeting the definition of a sealed source in RPS 11.  C32.4 There is effective monitoring and management of external and internal threats. Threat environments are actively monitored and managed. Security systems are used to manage identified threats as appropriate.  C32.5 Learning is achieved from the evaluation of internal and external incidents and operations with security implications.  C32.6 Physical protection is effective in the safeguarding of the facility and any nuclear and radioactive material authorised under the licence. The precise configuration and location of material is known and verified.  C32.7 Land management supports local security arrangements. Security signs and warnings are easy to see, unauthorised access is not obscured from view by trees or other vegetation.  C32.8 Drills and exercises are conducted periodically to test the responses to security plans and potential or actual security incidents. Where practicable, the security response is also tested during safety incidents, drills, and exercises. Security responses are demonstrated to be effective. Corrective actions are implemented in a timely manner.  C32.9 The protective security system comprehensively addresses security concerns and threats.  C32.10 Safety and security measures are developed so that they do not compromise each other. Safety and security are complimentary, and processes are designed so that measures for one compliment the other.  C32.11 A security plan for the facility is in place that is integrated with the site security plan and contains up to date, information, and a description of the facility, the means of physical protection and a description and location of any radioactive or nuclear material authorised under the licence.  C32.12 Security arrangements cover physical plant and materials, people, and information, including cybersecurity.  C32.13 The security plan accurately describes how the security system achieves the required security outcomes. Deviations between the security plan and actual practice are captured in a corrective action or learning reporting system and corrected in a timely manner.  C32.14 There are effective quality system arrangements in place and the arrangements are auditable.  C32.15 The trustworthiness of individuals in the workplace is assessed, reviewed and managed accordingly.  C32.16 Measures to detect and assess malicious acts (unauthorised removal, sabotage etc.) are implemented effectively.  C32.17 Vulnerability assessments are performed and regularly reviewed to identify weaknesses in the protective security system.  C32.18 Access authorisations and controls are implemented to protect vital and risk significant plant, equipment, and processes.  C32.19 Changes to security plans do not reduce the effectiveness of the plan.  C32.20 Threats from any non-routine activities makes consideration of introduced or revised threats.  C32.21 Security events are reported effectively - Lessons from security events are identified and learning is evident in ongoing practices. Lessons learnt from experience and good practices are effectively communicated to other facilities where relevant actions are consistently implemented.  C32.22 External incidents both national and international are used to improve internal security. Distancing through differencing is avoided. |  |
| **OBJECTIVE 7 - EMERGENCY PLANS**  *Plans and arrangements are in place to ensure that an adequate capability exists within the operating organisation for effective on-site preparedness and response in any radiological emergency.*  **Principles of radiation risk management (RPS F-1)**  *Principle 8 - Prevention of accidents and malicious acts: All practical efforts must be made to prevent and mitigate accidents, and acts with malicious intent, that may give rise to radiation risks*  *Principle 9 - Emergency preparedness and response: Arrangements must be made for emergency preparedness and response for incidents, accidents and malicious acts that may give rise to radiation risks* | | |
| **Criteria**  With reference to P&A Guide, RPS C-1 (Rev.1), AS/NZ 2243.4 & RPS G-3[[13]](#footnote-14) | **Sub-Criteria**  For more details refer to the relevant sections of the P&A Guide  and other documents listed in the criteria | **Observations / Comments** |
| **C33 Emergency Plans**  The licence holder has detailed emergency plans for any conduct or dealing that could give rise to a need for emergency intervention.  *P&A Guide (s7.1-7.25)*  *AS/NZ 2243.4 (s7)*  *RPS G-3* | C33.1 The licence holder has an emergency plan based on an assessment of the consequences of reasonably foreseeable accidents or incidents. These assessments consider design extension conditions (previous terminology – ‘beyond design basis’) emergencies (as appropriate to the facility) including the effects to multiple facilities and regional infrastructure. Local, regional, and international experience is considered. Safety cases, emergency plans and procedures are updated appropriately to reflect the outcome of the assessments.  C33.2 The content of the emergency plan should consider:   * The results of any accident/hazard analysis which has considered the consequences of hazards associated with facilities, activities, or other sources/materials on or beyond the site boundary (ARPANSA RPS G3) * The plan should include the events identified from the hazard/accident analysis and associated areas for which protective actions may be required and the actions which would be effective in mitigating the consequences of such events (Ref: Section 3.1 ARPANSA RPS G-3) * Any lessons learned from operating experience * Any lesson learned from accidents that have occurred with conducts or dealings of a similar type.   C33.3 The emergency plan is reviewed and updated at intervals specified in the licence holder’s plans and arrangements taking into consideration the results and any lessons learned arising from any emergency exercises.  C33.4 The emergency plan allocates responsibilities for notifying the relevant authorities and for initiating intervention if required.  C33.5 Emergency plans are incorporated into training and emergency drills and exercises are scheduled and occur periodically.  C33.6 As appropriate to the facility, emergency response plans for facilities, activities, sources, or materials need to consider emergency zones, emergency action levels (EALs), or other observable conditions and response time objectives (RTOs), Operational Intervention Levels (OILS) and early or urgent protective actions. (See RPS-G3 Section 4 and 5 for more information).  C33.7 Where appropriate, emergency planning takes account of the demands on human performance and endurance. This should include the demands placed on workers responding to long term events.  C33.8 Workers, facilities and equipment are ready to respond to emergencies, incidents, and other disruptive events. Arrangements include offsite response for design extension condition accidents and threats.  C33.9 Emergency management structures are established and implemented which meet practice goals.  C33.10 Emergency plans, procedures and instructions are prepared and readily available for all foreseeable emergencies identified in the safety case. Emergency response can be graded according to the severity of the emergency. |  |
| **C34 Emergency Procedures**  The licence holder 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.  *P&A Guide (s7.26-7.35)*  *AS/NZS 2243.4 (s7.2.1-7.2.7)* | C34.1 Lines of authority and procedures are clearly defined for responding to an emergency.  C34.2 A list of the emergency response facilities and equipment for use in the case of an emergency are in place (e.g. 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). Equipment should be appropriate for the measurement of radiation in an emergency situation (i.e. measurement range up to the magnitude of beyond design basis emergencies)  C34.3 Decisions are made by suitably qualified and experienced persons in accordance with stated accountabilities.  C34.4 The procedures/processes in place allow for the nature of the emergency or incident to be assessed, characterised, and managed promptly from a safety and security perspective; and by workers that are appropriately knowledgeable of operational matters.  C34.5 Effective strategies are in place to manage an emergency including mitigation actions, measures to inform the public and emergency dose limits as appropriate. |  |
| **C35 Emergency Drills and Exercises**  Emergency response is demonstrated to be effective through actions taken during emergencies, drills, and exercises.  *P&A Guide (s7.36-7.42)* | C35.1 Drills and exercises are carried out (every 3-5 years) in accordance with a plan that considers all aspects of an emergency response, including the interface with government, local authorities and off-site agencies.  C35.2 Lessons from operational events, drills training and exercises are identified and learnt. Learning is evident in the revisions of emergency response plans, procedures, instructions and is incorporated into training. |  |
| **C36 Leadership for Emergency Response and Preparedness**  Leaders prepare the organisation to respond to emergencies. Leaders install a culture of watchfulness and take opportunities to continuously improve. | C36.1 High standards and expectations for EPR are reinforced by the organisation’s leadership.  C36.2 Managers ensure that there are adequate resources available for the establishment and maintenance of EPR functions. |  |
| **C37 External Event Protection**  The licensee has considered and implemented controls regarding the effects of outside influences on the controlled apparatus or sources. (Examples of events to be considered include: fire, flood, cyclones, tidal waves, earthquake, lightning strike, other weather events or natural disasters; partial or total building collapse; tree, crane, or other structural impact; terrorist, riot, civil unrest, or other human aggression; utility failures such as loss or excess of water, gas, electricity; attack by rodents or other pests.) | C37.1 Combustible materials are appropriately minimised and kept away from safety significant Systems Structures and Components (SSCs) wherever possible. Administrative controls are in place to minimise the presence of combustible materials and other fire hazards.  C37.2 Where fire has been identified as a potential initiating cause for a radiation or nuclear event in the facility safety case, non-combustible materials are used wherever possible and reasonable.  C37.3 Fire systems and firefighting equipment is maintained and functional where fire has been identified as a potential initiating cause for a radiation or nuclear event in the facility.  C37.4 Where external events have been identified as a potential initiating factor in a radiological or nuclear event, the infrastructure is in good order - the general condition of infrastructure, combined with an external event does not present a hazard to nuclear or radiological safety.  C37.5 Where land management can impact the radiological or nuclear safety of a facility, procedures are in place for land management around the facility. The land is regularly inspected for fuel loading, drainage, pest infestation, etc. |  |
| **OBJECTIVE 8 – PROTECTION OF THE ENVIRONMENT**  *Protection of the environment is supported by prospective environmental assessment to identify impacts on the environment, to define criteria for protection of the environment, to assess the impacts and to compare the expected results of the available options for protection.*  **Principles of radiation risk management (RPS F-1)**  *Principle 6 - Limitation of risks: Measures for controlling radiation risks must ensure that no individual bears an unacceptable risk of harm, and that the environment is protected*  *Principle 7 - Protection of present and future generations: People and the environment, present and future, must be protected against radiation risks* | | |
| **Criteria**  With reference to P&A Guide, RPS G-1[[14]](#footnote-15), RPS G-2[[15]](#footnote-16), RPS 15[[16]](#footnote-17) & RPS C-1 (Rev.1). | **Sub-Criteria**  For more details refer to the relevant sections of the P&A Guide  and other documents listed in the criteria | **Observations / Comments** |
| **C38 Protection of Wildlife**  The licence holder has arrangements in place to demonstrate radiation protection of wildlife (plants and animals) in their natural habitats is consistent with international best practice.  *P&A Guide (s8.1-8.5)*  *RPS G-1*  *RPS C-1(Rev.1) Radiation management plan (s3.1.5(c))*  *RPS C-1 (Rev.1) Optimisation of protection and safety (s3.1.12)*  *RPS C-1 (Rev.1) Requirements for public and environmental exposure (s3.3)*  *RPS C-1 (Rev.1) Radioactive waste and discharges (s3.3.1-2)*  *RPS C-1 (Rev.1) Monitoring and reporting (s3.3.3)* | C38.1 In situations where environmental consequences are foreseeable radiation protection of wildlife in their natural habitats has been considered in parallel with radiation protection of people.  C38.2 Wildlife populations and ecosystems are shown to be protected using an environmental radiological assessment consistent with the methodology outlined in RPS G-1 Guide for Radiation Protection of the Environment.  C38.3 All potential exposure pathways to the natural environment have been identified including direct effects to wildlife in their natural habitats.  C38.4 The level of potential exposure has been assessed for all potential exposure pathways. |  |
| **C39 Monitoring of the Environment**  The licence holder is responsible for ensuring that plans and arrangements are in place and are implemented for the monitoring of the environment.  *P&A Guide (s3.57-3.62)* | C39.1 For those potential exposure pathways where exposure levels could be significant records demonstrate that an ongoing environmental monitoring regime is established, maintained, and regularly reviewed.  C39.2 Where ongoing environmental monitoring is not considered necessary for a specific potential exposure pathway this decision must be justified by analysis and calculations.  C39.3 The licence holder should verify that the monitoring data are relevant to, and do not indicate deviations from, the modelling of environmental exposures (to the public and to the environment) that formed part of the original licensing basis. |  |
| **C40 Contaminated Land/Site**  The licence holder is responsible for ensuring any land/site under their control contaminated with radioactive material is managed in accordance with any applicable laws and conditions of licence/authorisation issued to the licence.  *RPS G-1*  *RPS G-2*  *RPS 15* | Note: The management of contaminated land/sites is complex. The following sub-criteria simply reiterate main concepts. Any assessment of a licence holder’s management of a contaminated land/site should be undertaken informed by a detailed understanding of applicable laws, conditions of authorisation and standards/guides.  C40.1 RPS G-1 provides best practice guidance on how to assess environmental exposures and demonstrate protection of the environment from the human activities, past and present, that give rise to such exposures.  C40.2 RPS G-2 applies to exposure due to contamination of areas by residual radioactive material deriving from past activities that were never subject to regulatory control or that were subject to regulatory control, but which resulted in situations that, if they were being controlled today, do not meet current radiation protection standards.  C40.3 RPS 15 – remediation may be required at sites (legacy sites) that have been contaminated with naturally occurring radioactive material (NORM) as a result of past operations that were conducted prior to the introduction of regulatory requirements or under a different regulatory regime. |  |

1. Radiation Protection Series F1, *Fundamentals for Protection Against Ionising Radiation* [↑](#footnote-ref-2)
2. ARPANSA Regulatory Guide – Plans and arrangements for managing safety [↑](#footnote-ref-3)
3. Radiation Protection Series C-1 (Rev.1), *Code of Radiation Protection in Planned Exposure Situations* [↑](#footnote-ref-4)
4. Permitted Person, defined in s11A the Act [↑](#footnote-ref-5)
5. GSR Part 2 Leadership and Management for Safety, Requirement 1

   GSR Part 2, Objective [↑](#footnote-ref-6)
6. Australian/New Zealand Standard, *Safety in laboratories – Non-ionizing radiations – Electromagnetic, sound and ultrasound (AS/NZS 2243.5:2004)* [↑](#footnote-ref-7)
7. GSR Part 3, Requirement 1 [↑](#footnote-ref-8)
8. IAEA Glossary 2018, *radiation protection* [↑](#footnote-ref-9)
9. Australian/New Zealand Standard, *Safety in laboratories Part 4: Ionizing Radiations* (AS/NZS 2243.4:2018) [↑](#footnote-ref-10)
10. IAEA SSG-10 *Ageing Management for Research Reactors* [↑](#footnote-ref-11)
11. Radiation Protection Series C-6, Code of Practice for Disposal of Radioactive Waste by the User [↑](#footnote-ref-12)
12. Radiation Protection Series No.11, Code of Practice for the Security of Radioactive Sources [↑](#footnote-ref-13)
13. Radiation Protection Series G-3, Guide for Radiation Protection in Emergency Exposure Situations [↑](#footnote-ref-14)
14. Radiation Protection Series G-1, Guide for the Radiation Protection of the Environment [↑](#footnote-ref-15)
15. Radiation Protection series G-2, Guide for Radiation Protection in Existing Exposure Situations [↑](#footnote-ref-16)
16. Radiation Protection series 15, Safety Guide – Management of Naturally Occurring Radioactive material (NORM) [↑](#footnote-ref-17)