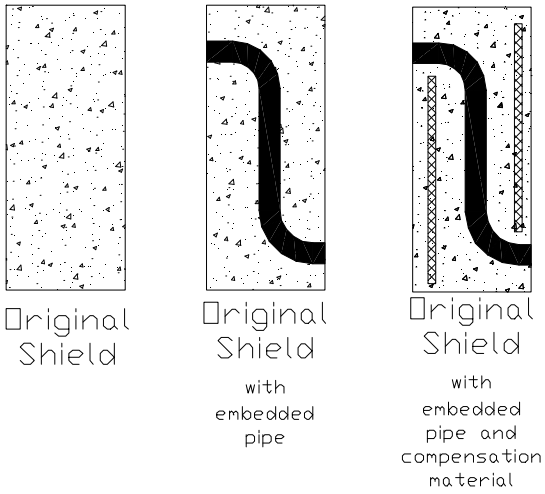
Question reference	Section number and name	Topic for clarification	ARPANSA Comment, Issue or Question and ANSTO Response
12.42.	12.3.1.1 Zoning and Access Control	"Restricted areas: areas where, due to nuclear or conventional safety reasons, special provisions are required to allow the presence of personnel. In these areas dose rate values are normally low but can increase suddenly without local control (that is, no local actions produce or can prevent the dose rate variation)."	ARPANSA expects that access to restricted areas will require adherence to the relevant radiation protection procedures, provision of personnel and radiation monitoring equipment, and work permits. Please explain what is intended by “special provisions”.
			Response: Special provisions means entry to such areas would require administrative controls and pre-planning to ensure the protection of personnel. This includes adherence to radiation protection procedures, the setup of specific plant status, the use of personal protective equipment and the use of safe working permits as applicable.
12.43.	12.3.1.1 Zoning and Access Control	"During commissioning, the Radiation Protection Advisor in conjunction with the Reactor Manager are responsible for setting the Area Classification. This may be modified as appropriate following operational experience."	ARPANSA expects that the relevant authorities and responsibilities of the Reactor Manager and Radiation Protection Advisor to be detailed in the appropriate procedures. The phrase “in conjunction with” should be more specific.
			Response: “In conjunction with” is used in the current Safety Directive on Radiological classifications and indicates a joint responsibility that cannot be performed unilaterally.
12.44.	12.3.1.1 Zoning and Access Control	"Certain operations in classified areas may raise or lower the hazard and potential radiation exposure for workers. A temporary upgrade or downgrade in classification may be considered."	The basis for temporary re-classification needs to be identified and a permit / notification system implemented to ensure appropriate transfer of knowledge of plant conditions during change of shift.
			Response: Temporary re-classifications will be consistent with clause 6.4 of the Safety Directive 5.4. This requires warning notices and protective measures to be changed to reflect the upgrade or downgrade, the ALARA principle to be applied and notification of classification changes to be given to Safety Division and those working in the area.

Question reference	Section number and name	Topic for clarification	ARPANSA Comment, Issue or Question and ANSTO Response
12.45.	12.3.1.1 Zoning and Access Control	"The use of the Reactor Facility by researchers and operations personnel is also taken into consideration. Routine procedures will be established to control the validity of the assigned classification of each area so that access and working requirements can be consistent with safety requirements."	What is meant or intended practically by this statement? eg. explain "control the validity"; "can be consistent".
			Response: Reword as follows: "Routine procedures will be established to confirm the assigned classification of each area remains valid to ensure access and working requirements are consistent with safety requirements." This will be amended in the next revision of the PSAR.
12.46.	12.3.1.1 Zoning and Access Control	"Areas have been designed with the criteria of preventing the spread of contamination. Access to areas of higher radiological hazards is to be from areas of lower classification."	Radiological control principles require that higher hazard areas need exit controls to ensure contamination is not transferred.
			Response: Agreed. This is consistent with the Reactor Facility design as described in Chapter 12. The location of these control points can be seen in Figures 12.3/17, 12.3/18, 12.3/19, 12.3/20 and 12.3/21 represented by Contamination Monitor & Walk Through Monitors.
12.47.	12.3.1.1.3.1 Access to the Reactor Building	"The Reactor Building has two accesses: main access through the office area access from the Neutron Guide Hall to Reactor Beam Hall"	How is the access from the Neutron Guide Hall to Reactor Beam Hall secured ?
			Response: By an ASNO approved system via an airlock.
12.48.	12.3.1.2 Component Layout	"b) …. Bent pipes are used in shielding wall crossings and, as appropriate, thickness reduction of shielding is compensated."	What is meant by "the thickness reduction of shielding is compensated" ?

Question reference	Section number and name	Topic for clarification	ARPANSA Comment, Issue or Question and ANSTO Response
			Response: A pipe embedded in a shield behaves as a void reducing the amount of attenuation material. In order to Keep the shield thickness constant, this removed material needs to be compensated by replacing part of the original shield material by other (generally concrete is replaced by lead or steel) with equal or greater attenuation properties. In other cases the wall thickness is greater than that required by the calculations in such a way that the concrete itself is used to compensate the possible addition of a pipe. 
12.49.	12.3.1.2 Component Layout	"c) Adequate elements of shielding are located among duplicated radioactive systems, allowing maintenance or repair operations to be carried out in one of them while the other is operating	How are "Adequate elements of shielding" determined?

Question reference	Section number and name	Topic for clarification	ARPANSA Comment, Issue or Question and ANSTO Response
			Response: The adequate elements of shielding are determined by considering: a) Ambient dose rate required b) Space requirements to adequately perform the foreseeable operations c) Structural consideration (loads, etc) d) Major component removal routes.
12.50	12.3.1.2 Component Layout	"f) Sedimentation of radioactive mud is minimised when possible. Components where it can accumulate are provided with means to remove sediments or to simplify maintenance operations.	How much “sedimentation of radioactive mud” is expected?
			Response: The quantity of sediment will depend on several factors, mainly the water quality.
12.51	12.3.1.3 Other Health Physics Related Design Features	"e) Reduction of the potential heavy water leakage to the environment. To this end, the reflector related systems have a helium cover and all components (including the heat exchanger) are canned and welded reducing to a minimum the number of flanges."	Please reference the PSAR section or supporting document which identifies the assumptions and extent leakage of heavy water to the environment.
			Response: See Chapter 16, Section 6.6.
12.52	12.3.2.1 General Design Criteria	Dose rate for shielding design.	It is not clearly specified in this section or the tables what is the dose rate criteria used in shielding design for different locations. The data in the Tables “stop” at varying dose rates from 1 to 0.1ìSv per hour. Please clarify.

Question reference	Section number and name	Topic for clarification	ARPANSA Comment, Issue or Question and ANSTO Response
			Response: For occupied areas dose rates less than 10 µSv/h at contact and less than 0.5 µSv/h ambient were used as design targets during the Preliminary Engineering stage. Moreover, dose rate criteria adopted for shielding calculation are consistent with the radiological area classification as explained in the following paragraph. The dose rate corresponding to a White Area is less than 0.5 µSv/h (< 1 mSv/y), to a Blue Area is less than 3 µSv/h (< 6 mSv/y) and for a Red Area is less than 10µSv/h (< 20 mSv/y) assuming an occupancy factor of 1. This criteria is modified, when appropriate, by: • Modification in the occupancy factor: Occupancy factors of 0.1 (eg non-occupied corridor) and 0.01 (eg non-occupied store room) can be used. • Transitory sources: Sources "in transit" will be shielded considering their activity, passing frequency and travel time. • Other considerations as shown in the response to Question 12.49. • Specific requirements such as the dose rate at the Operations Bridge above the pool top where the design target is less than 8 µSv/h (see Section 12.3.3). The data in the Tables stop at a dose rate values considered appropriate for the analysis (see response to Question 12.41)

Question reference	Section number and name	Topic for clarification	ARPANSA Comment, Issue or Question and ANSTO Response
12.53	12.3.2.4 Primary Cooling System Pump Room Shielding	"The walls that divide the pump rooms (-5.02, -5.03, -5.04) with the corridor (-5.06) and the piping connection room (-5.05) provide enough shielding to these areas for the source considered, allowing work with minimum radiation hazard. Wall thickness recommended is 30 cm of ordinary concrete. See Figure 12.3/10."	What are the thicknesses of the floor and ceiling ?
			Response: For all three rooms: Roof - 40 cm of light concrete. Floor - not applicable as this is the basement level with ground below.
12.54	12.3.2.6 Hot Cells	"2. Shielding Materials Iron and lead were selected as shielding door material and supplements.	What are the design features of the hot cell windows?
			Response: Commercial, off-the-shelf lead glass windows will be installed.
12.55	12.3.4.2.2	The ALARA Assessment	This section presents a theoretical discussion of ALARA. What has been done or will be done in practice?
			Response: In practice, the aim during preliminary design has been to achieve dose rates below the ALARA objective. Later, in detail design, if this can be achieved, the theoretical approach shown will be applied to define the final shielding dimensions.