Question reference	Section number and name	Topic for Clarification	ARPANSA Comment, Issue or Question and ANSTO's Response
6.1.	6.1.2	Summary description of cooling systems	It would be very helpful to have a summary table of which pumps on which cooling circuit are connected to the Stand-by Power Supply. This information is key to the safety analysis but is scattered in various sections of Chaps. 6 and 16.
			Response: As stated in Sections 6.3.4.2 and 6.8.5.2, only the long term pool cooling pumps within the RSPCS and the SCS are diesel-backed.
6.2.	6.2.2	PCS outside reactor pool safety category	What is the rationale for the portion of the PCS outside the reactor pool to be Safety Category 2 when it is Seismic Category 1? Do breaks in the coolant circuit envelope outside the reactor pool cause the reactor pool level to be lowered to an unsafe point?
			Response: Breaks in the PCS circuit outside the reactor pool will result in the pool water level falling to the siphon effect breaker level (+7 m). This is not an unsafe situation since core cooling is maintained by natural circulation through the flap valves located below this level.
6.3.	6.2.4	Radiation levels in the pump rooms	During full power operation the radiation levels in the pump rooms are stated to be low enough to permit entry for maintenance due to shielding thickness and coolant circuit delay. Is the possible buildup of activation products on the internal surfaces of PCS components with operating life taken into account when estimating these radiation levels?
			Response: Build-up of activation products on the internal surfaces is considered negligible, based on the recent INVAP experience in the disassembling of the PCS for the upgrading of Reactor RA3 (Argentina) from 5 MW to 10 MW. After 30 years in operation, corrosion and radiation buildup in piping and equipment was negligible.
6.4.	6.2.5	Large PCS leaks outside reactor pool	In the forced circulation mode will the pumps be tripped (and the reactor shut down in the event of a large PCS leak outside the reactor pool?
			Response: As stated in Section 6.2.8.4, the PCS pumps are tripped by the RCMS low reactor pool water level.

Question reference	Section number and name	Topic for Clarification	ARPANSA Comment, Issue or Question and ANSTO's Response
6.5.	6.2.5	PCS pump interlocks	In the last line of the table on p. 6.2-5, third column, please explain what is meant by 'Hard interlocks may be in place'.
			Response: Hard interlock in this context means key switch-interlocks located at the Local Control Station.
6.6.	6.2.5.3	Operating parameters for the natural circulation mode	In table at the bottom of p.6.-7, what is the basis of the 800 kW? Is it the maximum decay heat that can occur under conditions when the natural circulation mode is used? How is 'blackout incident' defined? Is it power cut to PCS pumps at full power operation?
			Response: 800 kW is the maximum decay heat that can be removed from the core by natural circulation. The coastdown of the PCS pumps and the opening of the flap valves after 70 seconds is timed to ensure an appropriate transition from forced circulation to natural circulation consistent with this limit. A "blackout incident" refers to the loss of off-site power supplies as discussed in Chapter 16, Section 16.8.
6.7.	6.2.6	Flap valve opening time	How does the coastdown time of the PCS pump/flywheel compare with the ~70 sec for the flap valves to fully open?
			Response: The weight of the flap valve piston and the decay in the PCS pressure due to the pump coastdown ensure that the flap valve opens 70 seconds after the loss of the pumps. The actual process of opening takes less than 5 seconds. After this time, the natural circulation can safely remove the core decay power.
6.8.	6.2.7.1.1	PCS pump flywheels	Is a program of NDT for the pump flywheels planned during their operating life?
			Response: Pumps flywheel NDT will be included in the maintenance program detailed in the Maintenance Manual.

Question reference	Section number and name	Topic for Clarification	ARPANSA Comment, Issue or Question and ANSTO's Response
6.9.	6.2.8.2	Core coolant flow measurement	How is the core inlet flow measured with one flow transmitter given that there are two PCS pump discharge lines into the core inlet plenum?
			Response: The three flow transmitters are located in the single discharge pipe before it branches into two pipes leading to the core inlet plenum.
6.10.	6.2.8.4	Reactor pool level alarms, etc.	What are the pool water levels corresponding to each alarm? This information could be conveniently provided in the table to save referring to a figure later in the PSAR. For example, is the level at which the reactor trips the same as the level at which the evacuation alarm sounds?
			Response: The exact reactor pool water levels associated with each alarm and trip setpoint will be determined during the detail engineering phase and presented in the FSAR. For information, note that at the Trip 1 level, the FRPS initiates a reactor trip via the FSS and the RCMS trips the PCS pumps and that at the lower Trip 2 level, the SRPS initiates a reactor trip via the SSS and the evacuation alarm is sounded.
6.11.	6.2.9.1	Trip signals	In the list of 'PCS pump trip signals generated by the RCMS', what is meant by: 'High flywheel bearing vibration + Very high flywheel bearing vibration' and 'High motor winding temperature + Very high motor winding temperature'? Which one causes the trip?
			Response: The "High" level will sound the alarm whilst the "High + Very High" generates a pump trip as indicated in Sections 6.2.8.6 and 6.2.8.7.
6.12.	6.2.9.2	Operator actions	This table is split between pp. 6.2-15 and 6.2-16. At the top of p. 6.2-16 there is nothing listed under 'Operator Action'. Is it intended that this be the same as shown at the bottom of p. 6.2-15?
			Response: Yes. This is due to the MS-Word feature for merged columns continuing over onto the following page.

Question reference	Section number and name	Topic for Clarification	ARPANSA Comment, Issue or Question and ANSTO's Response
6.13.	6.2.9.3.1	PCS pump interlocks	As the interlocks which prevent a third RCS pump being started are electrical, will there be an operating instruction requiring that the third pump also be physically isolated ('valved out')? In the last two entries in the table, what is the distinction between 'High Power Mode' and 'Power Mode'?
			Response: The requirement for physical isolation of the stand-by pump will be determined during the detail engineering phase and presented in the FSAR. The present intention is that the pumps not be isolated so as to enable a quick re-start in the event of the loss of one of the duty pumps. Both of the last two entries should be "High power mode".
6.14.	6.2.11	PCS design evaluation – flap valves	On p. 6.2-18, what is meant by 'Opening time (of the flap valves) is determined by the maximum power that can be removed under natural circulation conditions, ….'? Is it not the case that the pump/flywheel coastdown governs when the flap valves open, and the coastdown design spec. (70 sec) should be sufficient to avoid ONB? When the flap valves open would appear to be controlled by the declining pressure differential during coastdown.
			Response: The time at which the flap valve must open is determined by the maximum power that can be removed under natural circulation conditions. This is 70 seconds. The weight of the flap valve piston and the decay in the PCS pressure due to the pump coastdown ensure that the flap valve does actually open 70 seconds after the loss of the pumps. (The actual process of opening takes less than 5 seconds, see response to Question 6.7)
6.15.	6.2.11	Failure of flap valves	With regard to the simultaneous failure of 3 of the 4 flap valves with both PCS pumps failing, does it make any difference whether the 4th flap valve which is still operable is one at +7.0 m or +5.8 m?
			Response: It does not make any difference which of the flap valves is still operable. Any single flap valves ensures sufficient core cooling by natural circulation.

Question reference	Section number and name	Topic for Clarification	ARPANSA Comment, Issue or Question and ANSTO's Response
6.16.	6.3.1 Introduction	The Reactor and Service Pool Cooling System (RSPCS) performs the following functions: (a) Provide irradiation rigs cooling by natural circulation of reactor pool water under abnormal conditions, low power mode and shutdown state (Safety Category 1 function).	This Safety Function requirement does not appear to be indicated in Table 2.5/2 System ID 13 Reactor & Service Pool Cooling System – Please clarify
			Response: This safety function of the RSPCS is covered in Chapter 2, Table 2.5/2 under sub-system 0646 REACTOR TANK PIPING (Pool Cooling System Piping Inside Reactor Pool).
6.17.	6.3.1 Introduction	The Reactor and Service Pool Cooling System (RSPCS) performs the following functions: (c) Long Term Pool Cooling under abnormal conditions, low power mode and shutdown state (Safety Category 2 function).	Do abnormal conditions include accidents? Is so, should the function be Safety Category 1?
			Response: The principal means of ensuring nuclear safety is heat removal by natural circulation with the reactor pool water acting as the ultimate heat sink. The LTPC function only provides an additional significant contribution to safety but is not essential. As such, its allocation to safety category 2.
6.18.	6.3.1 Introduction	The heat removed by the RSPCS is transferred to the Secondary Cooling System (SCS).	Is the RSPCS an open system to the Reactor Hall? If so, what roll does the HVAC and and Containment Pressure Relief and Filtered Vent System play in heat removal under all operating conditions?

Question reference	Section number and name	Topic for Clarification	ARPANSA Comment, Issue or Question and ANSTO's Response
			Response: The Reactor Building HVAC removes sensible and latent heat transferred from the pools to the air in the reactor hall during normal operating conditions. Following containment isolation, the Containment Energy Removal System performs this function so as to maintain the containment pressure at less then or equal to the external atmospheric pressure. The Containment Pressure Relief and Filtered Vent System is not required for any design basis event as discussed in Chapter 7, Section 7.8.3
6.19.	6.3.2 System Categorisation	Safety and Seismic Categories and Quality Class assigned to the RSPCS are…	Table 2.5/2 does not clearly identify the revevant items – please clarify.
			Response: As stated in response to Question 6.16, "RSPCS used for rigs cooling by natural circulation" is covered in Chapter 2, Table 2.5/2 under sub-system 0646 REACTOR TANK PIPING (Pool Cooling System Piping Inside Reactor Pool). Similarly, the "Remainder of the RSPCS" is covered under sub-system 1310 RSPCS EQUIPMENT & PIPING COMPONENTS.
6.20.	6.3.2 System Categorisation	(b) To provide adequate protection from radiation exposure to operating staff and research personnel, by means of a transport delay to allow decay of radioactive products.	This would indicate that the water is considered to be part of the RSPCS. Is the water explicitly discussed? Please provide reference.
			Response: Do not understand the comment. This safety function relates to the provision of a shielded decay tank that allows for the decay of N16 in the pool water prior to the water passing through piping outside the main reactor block.

Question reference	Section number and name	Topic for Clarification	ARPANSA Comment, Issue or Question and ANSTO's Response
6.21.	6.3.4.1Cooling for the Reactor Pool	The position of a Three Way Valve defines which of the two lines is connected…	Are the details of the Three Way Valve discussed elsewhere? What is the Safety Category of the valve? Where is the valve physically located?
			Response: The details of the three-way valve will be determined during the detail engineering phase and presented in the FSAR. As indicated by the table in Section 6.3.2, it is Safety category 2 (ie it is not part of the RSPCS used for rigs cooling by natural circulation but it is part of the remainder of the system). As indicated in Sections 6.3.4.1.1 and 6.3.4.1.2 and shown in Figure 6.3/1, it is located upstream of the RSPCS Decay Tank in the Decay Tank Room
6.22.	6.3.4.1.1 Rigs Cooling Branch	The Rigs Cooling branch is designated Safety Category 1…	Is the Rigs Cooling branch identified as a sub-system in Table 2.5/2? Please provide reference.
			Response: The Rigs Cooling branch refers to the section of the RSPCS used for rigs cooling by natural circulation. As stated in the response to Question 6.16, "RSPCS used for rigs cooling by natural circulation" is covered in Chapter 2, Table 2.5/2 under subsystem 0646 REACTOR TANK PIPING (Pool Cooling System Piping Inside Reactor Pool).
6.23.	6.3.4.1.1 Rigs Cooling Branch	This branch has a ND150 mm pipe that extends from the Irradiation Rig Plenum below the Reflector Vessel and passes through the Reactor Pool boundary at level +7.00. Beyond the reactor pool boundary, it is connected to the three way valve and then to the RSPCS Decay Tank.	Table 2.5/2 appears to classify systems within the reactor pool as Category 1 and systems out of the pool as Category 2. Does this mean that the Rig Cooling system is a mixture of the two? If so, where is the interface between the two classifications?

Question reference	Section number and name	Topic for Clarification	ARPANSA Comment, Issue or Question and ANSTO's Response
			Response: The portions of the PCS and RSPCS within the reactor pool are Category 1 and the portions out of the pool are Category 2 (Rig Cooling is one of the operation modes of the RSPCS, the other mode is Long Term Pool Cooling). Any breakage in the PCS or RSPCS out of the pool is protected by the Category 1 siphon breakers, which will maintain the pool with enough water to protect the core. For that reason, the portions out of the pool do not perform a Category 1 function. The interface between the two classifications is the reactor pool coolant boundary, described in Chapter 4, Section 4.5.
6.24.	6.3.4.1.2 Long Term Pool Cooling Branch Circuit	The other RSPCS suction pipe is the Long Term Pool Cooling (LTPC) Branch	Is the Long Term Pool Cooling branch identified as a sub-system in Table 2.5/2? Please provide reference.
			Response: Long Term Pool Cooling equipment inside the reactor pool is covered under subsystem 0646 REACTOR TANK PIPING (Pool Cooling System Piping Inside Reactor Pool), while equipment outside the reactor pool is covered under subsystem 1310 RSPCS EQUIPMENT & PIPING COMPONENTS.
6.25.	6.3.4.1.2 Long Term Pool Cooling Branch Circuit	The Reactor Pool branch meets the interconnection line from the PCS before entering the pool.	Table 2.5/2 appears to classify systems within the reactor pool as Category 1 and systems out of the pool as Category 2. Does this mean that the Primary Cooling System is a mixture of the two? If so, where is the interface between the two classifications?
			Response: See response to Question 6.23.
6.26.	6.3.4.2 RSPCS Operation Modes	The RSPCS has two operation modes depending on the position of the three way valve…	There is no Abnormal Operating State listed – does this mean that the system has no role at all during an abnormal occurance?

Question reference	Section number and name	Topic for Clarification	ARPANSA Comment, Issue or Question and ANSTO's Response
			Response: The RSPCS has a role during abnormal conditions with respect to the transition from forced circulation to natural circulation for rigs cooling as identified in Section 6.3.4.2.2. This will be amended in the next revision of the PSAR.
6.27.	6.3.4.2 RSPCS Operation Modes	The LTPC pumps are backed by standby power to ensure their availability in the event of a loss of main power supply.	Has this been taken into account for load calculations?
			Response: Yes, the load allowance for the SPS includes the LTPC pumps.
6.28.	6.3.4.2.3 Transition from Rigs Cooling Mode to Long Term Pool Cooling Mode	This transition does not affect nuclear safety, but is advisable as it makes optimum use of the reactor and supporting equipment.	Has the affect on nuclear safety been analysed in the PSAR? Please provide reference.
			Response: As stated, this transition does not effect nuclear safety since core cooling is ensured by natural circulation with the reactor pool water acting as the ultimate heat sink as described in Section 6.3.4.2.4.1.
6.29.	6.3.4.2.3 Transition from Rigs Cooling Mode to Long Term Pool Cooling Mode	(d) An RCMS interlock by means of a PCS flow and core differential pressure signal prevents accidental switching of the three-way valve to its LTPC position during reactor operation	Does the RCMS interlock also prevent reactor startup if the valve is in the incorrect position?
			Response: Yes, as identified in Section 6.3.8.3

Question reference	Section number and name	Topic for Clarification	ARPANSA Comment, Issue or Question and ANSTO's Response
6.30.	6.3.4.2.4.1 Long Term Pool Cooling for Reactor and Service Pools Pumps	It should be noted that after the reactor shutdown, with the core cooled by PCS natural circulation, the decay heat of the core is removed by the water inventory of the reactor pool and the capacity of the pump in service is not important in respect of core cooling. The RSPCS may, in fact, not operate at all, without representing a hazard to the reactor.	This appears to be an important statement and it seems unusual that it is buried so deeply in the PSAR (Level 6 Heading). The statement appears to indicate that the entire RSPCS is not required after shutdown, if this is so the statement would seem more appropriate in the Introduction (Section 6.3.1)
			Response: Agreed, a statement to this effect will be included at the beginning of Section 6.3 in the next revision of the PSAR.
6.31.	6.3.10 Reactor and Service Pools Cooling System Design Evaluation	CHEMCAD 5.0.01 Chemstations Inc. software. Engineers Aide SINET-XLT 5.3, Epcon International is used to perform head loss calculations for pipe networks CRANE Companion 2.50 ABZ Inc. is used for single pipeline calculations.	Have these software packages been independently validated? Have independent checks been made on the calculations?
			Response: These software packages are widely used in industry. They have been used extensively by INVAP designers for different projects (including the MPR Egyptian reactor). In addition, the calculations have been checked against the RETRAN Code for steady state conditions with the same results being obtained.

Question reference	Section number and name	Topic for Clarification	ARPANSA Comment, Issue or Question and ANSTO's Response
6.32.	6.3.10 Reactor and Service Pools Cooling System Design Evaluation	Redundancy of the flap valves provides the system with the required Category 1 reliability.	What is the required reliability for the system? Is it quantified as the probability that the system will perform satisfactorily over a given period of time?
			Response: Rigs Cooling in natural convection mode is identified as an ESF and the reliability of ESFs is specified in Chapter 2, Section 2.3.5: Provision of Safety Systems and Section 2.4.10.2: Reliability of ESF. Reliability is quantified as the probability that the system will perform its required function under stated conditions over a given period of time. Availability has essentially the same definition but considers the probability that the system will be operating at a given time. Thus, it takes into consideration the combined aspects of reliability, maintainability and maintenance support.
6.33.	6.4.4 Circuit Description	The system will be operated continuously regardless of whether or not the reactor is in operation.	This statement would suggest that the system is supplied by the Standby Power Supply – is this correct? What about maintenance requirements – is there redundant systems?
			Response: This system does not require any power supplies since it makes use of the RSPCS pump head. Since during all normal operating states at least one RSPCS pump is operating, this system will also be operating. Maintenance is possible since there are two 100% capacity trains.

Question reference	Section number and name	Topic for Clarification	ARPANSA Comment, Issue or Question and ANSTO's Response
6.34.	6.4.9.1 Fabrication and Assembly	The inspection and testing program for fabrication, assembly, pre-operation and in-service operation shall be fully developed during detailed engineering in accordance with the Construction Inspection and Test Plan (CITP).	The Reactor Coolant Purification System is classified as a "Quality Level C" system (Table 2.5/2). Chapter 2 Section 2.5.3.4 indicates that a Quality Level C system will not have an "Inspection & Test Plan" but a "Provision Plan". Section 2.5.3.4 states "The implementation of these Quality Levels is discussed in Chapter 18". A word search for "quality level", "provision plan" failed to locate any mention of these terms. Please clarify. There appears to be a lack of coordination/consistency between the chapters of the PSAR. It would appear that many of the references to other chapters do not provide supporting information.
			Response: The inspection and testing program referred to (to be developed during Detail Engineering) means: Fabrication (Procurement stage): Provision Plan (for QA "C" system) as stated in Chapter 2, Section 2.5.3.4. Assembly (Construction phase): Installation inspection and test plan Final part of Construction phase: Pre-operational test . Implementation of Quality levels is defined in the Project Quality Assurance Plan (see Chapter 18, Section 18.4.2.1). The coordination/consistency between the chapters of the PSAR will be revised and corrected for the next revision of the PSAR. The appropriate supporting information will be provided in the FSAR.
6.35.	6.4.11 Seismic Evaluation	The RCPS is classified under Seismic Category 3 and the resin beds Seismic Category 1.	Table 2.5/2 indicates that the RCPS is Seismic Category 1 & 2, only the instrumentation is category 3 – please clarify.

Question reference	Section number and name	Topic for Clarification	ARPANSA Comment, Issue or Question and ANSTO's Response
			Response: The allocation identified in Chapter 2, Table 2.5/2 is correct. The inconsistency in Chapter 6 will be corrected in the next revision of the PSAR.
6.36.	6.6.3	Safety design bases	What is meant by 'b)'? Sentence would appear to be incomplete.
			Response: Agree; wording should be "To prevent any leakage of heavy water beyond the containment through a leak in the heat exchanger". This will be amended in the next revision of the PSAR.
6.37.	6.6.4.4	D2 recombination	What are the 'high temperatures' at which the recombiners are designed to operate?
			Response: The "high temperature" referred to is 500 ºC as indicated in Section 6.6.6.4.2 Recombination Units.
6.38.	6.6.5.1	Reflector cooling parameters	On p. 6.6-6 the thermal load is given as 1.6 MW of which 1.2MW is attributable to fission energy from the core. What accounts for the other 0.4 MW?
			Response: 1.6 MW is the design thermal load, 0.4 MW is the thermal margin.
6.39.	6.6.6.1.6	Reflector storage (dump) tank	What grade of austenitic stainless steel is used in the construction of the reflector storage tank?
			Response: Stainless steel 304L as described in Chapter 5, Section 5.9
6.40.	6.6.6.4.1	Recombination system compressor	What grade of austenitic stainless steel is used in the construction of the recombination compressor?
			Response: This will be determined during the detail engineering phase and presented in the FSAR
6.41.	6.6.6.4.2	recombiners	What type of stainless steel is used in the construction of the recombiners?

Question reference	Section number and name	Topic for Clarification	ARPANSA Comment, Issue or Question and ANSTO's Response
			Response: Please refer to response to Question 6.40
6.42.	6.6.6.4.3	Gas coolers	What grade of austenitic stainless steel is used in the construction of the recombination gas coolers?
			Response: Please refer to response to Question 6.40
6.43.	6.6.6.4.4	Flame arresters	What type of stainless steel is used in the construction of the flame arresters?
			Response: Please refer to response to Question 6.40
6.44.	6.6.7.1.1	Temperature alarms	With regard to the reflector vessel temperature switch, please give some indication as to what is meant by 'High temperature' and 'Very high temperature'
			Response: Values for high and very high temperatures will be determined during the detail engineering phase and presented in the FSAR. Note that high temperatures values will initiate a power reduction via the RCMS whilst very high temperatures will initiate a reactor trip through the SRPS.
6.45.	6.6.7.1.5	Gas analysis	With regard to deuterium analysis in the heavy water expansion tank atmosphere being high and ver high, what is meant by the Protection Function being 'Regulates deuterium inlet valve'? There does not appear to be any deuterium gas addition to the recombination circuit.
			Response: This is an error. "Regulates deuterium inlet valve" statement should be changed to "Regulates oxygen inlet valve". This will be amended in the next revision of the PSAR.
6.46.	6.6.7.3.3	Intermediate cooling circuit flow	Why does low flow prevent reactor startup but not cause a power reduction if the reactor is already operating at power?
			Response: The interlock is provided to ensure that the plant is in a fit state to start-up. The high reflector vessel temperature will detect failures during operation. This will lead to a reactor trip via the SRPS/SSS.

Question reference	Section number and name	Topic for Clarification	ARPANSA Comment, Issue or Question and ANSTO's Response
6.47.	6.6.7.4.1	Deuterium recombination temperature	Does the 'temperature transmitter – recombiner catalyst bed' apply to each recombiner unit (as for the recombiner outlet temperature).
			Response: Yes, each recombiner does have its own set of temperature sensors including a catalyst bed sensor.
6.48.	6.6.8.1.2	Manual shutdown conditions	With regard to 'Very high deuterium concentration in cover gas' and 'High concentration of deuterium/oxygen in cover gas', will operating procedures require manual shutdown when the D2 or O2 concentration reaches a certain level. If so, how far is this level below the explosive limit?
			Response: The limits on the gas concentrations will be determined during the detail engineering phase and presented in the FSAR. Any requirements for manual shutdown will also be determined and will be identified in the appropriate procedures.
6.49.	6.7.7.1 Water Storage tank	Volume: 7.1m3 Diameter: 2.05m, Length: 1.7m	Volume of tank equates to 5.6 m3. Total volume of 2 tanks is less than the 12 m3 required to maintain constant flow for 24 hours. Please clarify
			Response: 5.6 m3 is the volume of the cylindrical shell. The volume of the torispherical heads is 1.5 m3, so the total geometric volume is 7.1 m3
6.50.	6.8.4	Secondary cooling circuit description	Why are the pumping groups not housed in a building to facilitate maintenance during inclement weather?
			Response: This is a project decision that does not affect the safety case presented in the PSAR. Note that there are disadvantages associated with putting these pumps inside a building (eg to ensure an adequate headroom inside the building for cranes, the height of the building could interfere with the air flow to the cooling towers in the limited space available).

Question reference	Section number and name	Topic for Clarification	ARPANSA Comment, Issue or Question and ANSTO's Response
6.51.	6.8.4.2	Secondary cooling circuit for long term pool cooling	The pumps of the long term pool cooling system are connected to both the main power supply and to the stand-by supply. How is separation of the two supplies maintained?
			Response: There is only one power distribution to any pump (ie a single power cable) even if the pump has two sources of supply. If the normal supply is unavailable, the stand-by power supply is switched in automatically at the relevant distribution boards.
6.52.	6.8.5	Secondary cooling circuit operation modes	Under what circumstances will the long term pool cooling pumps start automatically when the main secondary pumps stop because of loss of power, or do they always have to be started manually.
			Response: The LTPC pump groups within the RSPCS and the SCS do not start automatically, they are only started manually. The timing to start these pumps does not compromise safety since the reactor pool water can act as the ultimate heat sink for an extended period of time (ie days).
6.53.	6.8.8.1	Secondary coolant treatment system	What is the purpose in (d) of dosing the coolant with sulphuric acid? Is it part of the pH control mentioned in (c)? What measures, apart from blowdown (b), are taken to prevent scale (calcium sulphate) formation in the system?
			Response: Dosing with sulphuric acid is necessary to control the circuit pH and keep it below a maximum of about 7.6. At pH levels above 7.6, sodium hypochlorite loses its effectiveness as a biocide. Scale control will be achieved by the use of appropriate sequestrants very similar to those currently being employed in the HIFAR secondary cooling circuit at this time. The agents currently in use are low molecular weight polymers which have been demonstrated in the HIFAR secondary cooling system to maintain magnesium and calcium salts in solution at pH's up to and above 9.

Question reference	Section number and name	Topic for Clarification	ARPANSA Comment, Issue or Question and ANSTO's Response
6.54.	6.8.8.3	Secondary coolant treatment system operation	Is the sodium hypochlorite used as a biocide to complement the (non-oxidant) biocide? What chemical system is to be used as the corrosion inhibitor?
			Response: Yes, sodium hypochlorite is to be used as an alternate biocide in conjunction with a non oxidising biocide as best practice for microbial control would dictate. The chemical system to be used for the corrosion inhibitor will be very similar to the system in use at HIFAR at the present time.
6.55.	6.9.2	Piping material for PCS, RSPCS, RCPS	Why is cast iron used for the butterfly valve bodies in a Seismic Category 1 system when there is the possibility of brittle failure.
			Response: The cast iron bodies of Butterfly valves are widely used for more severe conditions than expected in the Reactor Facility. The valve body is assembled between flanges and bolted, forming a very rigid component, minimising the potential of brittle failure.
6.56.	6.9.2	Piping material for PCS, RSPCS, RCPS	The material used for check valves is listed as 300 series stainless steel. However, in Chap. 16 (16.11.3.2) mention is made of check valves in the RSPCS having cast iron bodies. Which is correct?
			Response: Chapter 16, Section 16.11.3.2 will be corrected to include "check valve Wafer type, body, disk and stem AISI 316, seat O-ring & packing EPDM" in the next revision of the PSAR.