OHSE Form

Risk Management – Monitor and Review (Operation of SAC)

Results of SAC Assessment

Note: Fill in all appropriate fields, delete or enter N/A for non required fields.

SECTION 1 – GENERAL DETAILS AND SUMMARY OF ASSESSMENT

DETAILS	
Date and Time	4th August 2010
SAC Title	ANSTO Camperdown 30MeV Cyclotron and Radiopharmaceuticals Production Decommissioning
SAC No.	1859
Location (Building and Room/s)	Bld 81 Various Rooms including 43 Control Room, Rm 53 Cyclotron Vault, Beam lines 51/53/61/59, GMP Room 0037/0038, Spect lab rooms 48/49. Target transfer system, ventilation air handling unit
SAC Assessor(s)	Ralph Blake (OHS) Joy Perera (SSR) , Mark Alexander (Regulatory Affairs Officer – attended initial meeting and gave some preliminary comments)
Divisional Staff in Attendance (Including Position)	Basil Ellis / Chris Penny / Gary Simms / Alec Kimber / Algis Lencus / Alamgir Kabir / Francesca Wigney.

SUMMARY OF GENERAL ISSUE ASSESSMENT

General Comments/Observations:
Scope of the decommissioning project is the removal of the redundant equipment and services from the areas listed in the decommissioning plan and memo to Hefin Griffith (Manager QSERP) dated 23 August 2010. This includes, Stage 1 - Vault, PET Room and control room, and Stage 2 Information not included as a part of this assessment) – SPECT beam rooms and Radiological production areas.

Main hazards and issued considered include,
- Control and training of contracted staff
- Effective supervision of the project
- Lone workers.
- Working at heights eg. Above cyclotron, ceiling space
- Working in confined / restricted space eg ceiling space, service pits and trenches
- Traffic control and management around the site.
- Electrical work.
- Heavy lift.
- Manual handling.

Draft SWMES have been developed for work in the vault, control room and the dismantling of the GMP hot cells. A Responsible Officer will be charge of the dismantling and decommissioning process at all times. Further SWMES need to be developed for each of the tasks involved with the decommissioning.

The work will be largely carried out by ANSTO staff with some assistance from experienced contracted staff. The area was essentially left as is by the former occupants (ARI) and some

equipment returned to LHSTC. Each task will be risk assessed prior to starting and where appropriate a SWMES and SWP will be issued.

ANSTO (MPDO) will maintain effective control of the project through the Project Manager and works Co-ordinator. OHS staff will be available as requested by the project management to conduct daily walkthroughs, tool box talks, advise on risk assessments, confined space and working at heights. Etc.

A OHS program will be developed for required tool box talks, inspections etc. As per MOATA.

The following documents have been provided for review:-
1. Letter – Decommissioning licence dated 09/07/2010, Alec Kimber
2. ANSTO Camperdown Facility Decommissioning Plan, AC-D-LA-E7a July 2010. (Later)
3. Decommissioning safety Assessment of the ANSTO Camperdown Facility TN 2010-9 June 2010.
4. OHSE category Determination form AF 2322, 8/2/10
5. Request for OHSE Approval AF2321, 8/7/10
6. Facility Licence Application (Nuclear Installation) Undated / unsigned
7. ANSTO Camperdown Facility Decommissioning Effective Control Plan – AC-D-LA-E6a, June 2010.
8. ANSTO Camperdown Facility Decommissioning Safety Management Plan – AC-D-LA-E6b, June 2010.
9. ANSTO Camperdown Facility Decommissioning Radiation Protection Plan – AC-D-LA-E6c, June 2010.
10. ANSTO Camperdown Facility Decommissioning Waste Management Plan – AC-D-LA-E6d, June 2010.
11. ANSTO Camperdown Facility Decommissioning Security Plan – AC-D-LA-E6e, June 2010.
12. ANSTO Camperdown Facility Decommissioning Emergency Plan – AC-D-LA-E6f, June 2010.
13. NMC Source term evaluation NASDOC RP10-0154 A 12 July 2010.
14. Toll Project Services - Cyclotron Removal& Transport (Lift and Transport Plan) Draft 17 June 2010.
15. Preliminary SWMES for Cyclotron decommissioning of B81 Control room (43), vault (53) and GMP Hot cells removal August 2010.
16. Memo to Hefin Griffiths (Chair SAC) dated 23 August 2010 (ref # 01-129-0015), " ANSTO Camperdown Decommissioning Licence Application."
17. Risk assessment for the removal of Cyclotron from vault Dated 12 August 2010.

Note:- This assessment is a preliminary hazard review based on the information provided to the assessor. The dismantling program allows for a staged decommissioning i.e. (IAEA TECDOC 1394) in which not all aspects of the program are documented. However a structured methodology is used to manage the program safely.

SUMMARY OF HAZARD ASSESSMENT

Ionizing Radiation
Reviewed by Radiation Assessor

Radiation Contamination
Reviewed by Radiation Assessor

Criticality
Not Applicable

Non-Ionizing Radiation
Not Applicable

Chemical

Legacy chemical issues remain at the NMC. General lab areas have been generally well cleaned. Beryllium survey has been carried out. Chemical waste will be sent to LHSTC for safe disposal. The chemicals remaining in the basement area have been temporarily consolidated. The long term disposition of these is being managed in conjunction with waste operations. Any chemicals used in the dismantling program will have an appropriate MSDS, risk assessments and controls in place.

Required PPE should be defined fort the various areas in SWMES and on signage.

Biological
Not Applicable

Confined Space
Confined spaces may include vault trench, ceiling space and service pits and channels. Confined Space Risk Assessments will be required to assess the hazards in these areas. Those entering a confined space will require a current confined space ticket. Controls as outlined in the ANSTO OHSE system will be used to control the access and work conducted in these areas.
A confined space gas monitor and bump test equipment will be on hand at all times. Ensure that the Tank spacers are correctly positioned prior to entry into the tank

Fire/Explosion
The fire services will remain operational throughout the decommissioning project. It is not anticipated that any hot work will be required however if it is the required Hot work Permits will be issued.
A small hydrogen gas bottle will be removed prior to any work commencing in the vault. Hydrogen

High/Low Pressure
Gas and air services are provided into the various areas of the NMC. These will be isolated prior to dismantling.

High/Low Temperature
Bulk Liquid Nitrogen stored outside. Pipes and valves will b e positively isolated.

Dust
It is not expected that significant levels of dust will be generated as a result of these activities. If an issue is identified

Cryogenics
A bulk Liquid Nitrogen tank is located outside building and presents an asphyxiant hazard. This will be either emptied or positively isolated prior to work commencing. Eg spool piece removed and valves isolated.

Mechanical/Plant
Plant and equipment used will be general trades tools. Electrical equipment will have a current test tag. It is not expected that any other heavy plant will be required for lifts. Forklift, Crane, EWP and trucks may be required and all operators will be appropriately ticketed and pre operations checks completed.

The final lift of the cyclotron from the vault will be done in accordance with requirements of the specialised lift contractor (Toll). A preliminary SWMES and risk assessment have been developed for this. The final detailed planning and risk assessment will be completed prior to the lift.

Manual Handling/Ergonomics
Large pieces of equipment will be required to be moved from the various areas to either a staging area for removal or for disposal. Trolleys will be on hand to assist. All contractors will complete the contractors induction and a tool box talk relating to manual handling.

Electrical
The NMC has had a number of electrical refits. In particular the control room, vault and production

areas. Electrical issues are known to exist. It is planned to isolate and prove dead unused electrical services and provide dedicated power for lights and equipment to conduct the decommissioning. All leads and temporary services need to comply with regulations and code of practices. All electrical work will be conducted in accordance with the Electrical procedures.
Electrical isolations will be carried by ANSTO staff and confirmed by the worker. Isolated equipment will be tagged and locked out.
Isolations / de isolations will be controlled by the works Supervisor in charge.

Noise
Noise levels are not expected to exceed the statutory limits of 84 dBA TWA or peak levels. Where a noise issues is identified an assessment will be done and appropriate controls put in place in consultation with the OHS advisor.

Heights
Working at heights hazards include eg, working above the cyclotron, removing monitors, working in the ceiling spaces, voids and on top of the roof when the access plug is removed. Adequate controls will need to be in place when working in these areas. Those working in areas above 2m, within 2m of un unprotected edge, or where a fall of potentially 2m can occur will be required to have a risk assessment and required working at heights tickets and adequate fall prevention controls in place. Note Several near misses have occurred to staff working in the ceiling space.
The use of ladders should be avoided where possible by using alternate eg platform or scaffold. Where ladder are used they will be used in accordance with the safety guidelines i.e. tied off, footed, angle of repose etc.
Controls consistent with the ANSTO OHSE Working at Heights procedures and national code of practice will be used.

Construction / Deconstruction
All staff will attend regular tool box talks and be briefed in the various tasks. SWMES and SWP will be used for all tasks as required.

Toll have been engaged to complete the lift of the cyclotron from the vault. A risk assessment has been developed for this task and detailed planning and assessments will be done before the lifts. Ensure that surrounding occupants have been informed. Access to and from the child care centre at the rear of the NMC should be considered. This includes a traffic management plan for the lift. Traffic control plan to be assessed and updated as required. Lifting frames and devices will be inspected prior to use.

High level of housekeeping to be maintained and industry standard safety signage indicating the site is a construction / de-construction zone should be used.

Environmental
All waste materials should be stored appropriately and be disposed of promptly. Waste material should be left laying around to cause access and trip hazards.

Other
- Control / induction and training of contractors working on the project will be in accordance with ANSTO procedures.
- No lone workers.
- Supervisor will always be onsite.
- Ensure that all contractors have current licences.
- First Aid officer and First Aid kit will be on hand.
- All contractors to complete the required Contractor inductions

Mandatory PPE to be decided recommended safety boots, Hi Vis vest , and safety glasses, and as required fitters gloves, hard hat. Other as required by OHS and or HPS.

OHS will conduct Safety audits during the decommissioning to assess if the guidelines are being

followed.

Emergency access will be maintained at all times and assessed regularly.

SUMMARY OF PROCEDURAL ASSESSMENT

Adequacy and Frequency of Internal Reviews

Regular walkthroughs and compliance checks will be conducted by the project management team in consultation with the OHS advisor.

Inventory Control of Dangerous Goods

The basement area contains stored liquid waste which has been consolidated and segregated. The long term disposition of these chemicals is being managed in conjunction with waste operations.

Generally the lab areas have been cleared of chemicals, however precautions should be taken to prevent exposure to residual chemicals.

APPROVAL AND CONDITIONS

SAC Approved	Yes ☒	No ☐

Nil conditions. See section 2

ASSESSOR NAME	SIGNATURE	DATE
Ralph Blake (OHSS) Joy Perera (SSR)		25/8/2010 25/8/10 31/08/10

RESPONSIBLE OFFICER ACCEPTANCE

RESPONSIBLE OFFICER	SIGNATURE	DATE
BASIL ELLIS	Basil Ellis	25/8/10

SECTION 2 – ASSESSOR COMMENTS AND RESPONSE

SPECIFIC COMMENTS			
SAC Number:	**1859**	**Date of Assessment:**	**August 2010**
Assessors Comments on [ANSTO Camperdown 30MeV Cyclotron and Radiopharmaceutical Production Decommissioning]			

Ref #	Assessor	CAT	Comment	RO Response	Assessor's Comments	Supporting Documents Amended/Added
1	Ralph Blake	2	The hazard items identified in the SAC (request for OHS Approval Form) need to be referred to in the hazard controls section or the references made clearer.	The correlation between the hazards and the corresponding controls is shown in the Safety Assessment TN/2010-9 hazard identification and risk assessment table in Appendix C. In this table, for each task, the hazards and corresponding controls are shown. The preliminary SWMS that have been provided make this clearer.	Accepted	Draft SWMES

2	Ralph Blake	2	The Decommissioning Plan lists the work tasks but does not list the corresponding hazards or controls.	The fullest listing of the work tasks is given in the Decommissioning Plan. The Safety Assessment Appendix C column 3 “Task” shows an abridged version of the tasks in the Decommissioning Plan e.g. the removal of the three beam lines, which involve similar activities and corresponding hazards and controls, are shown as “removal of beam lines” in the Safety Assessment. This is sufficient for the assessment. The Safety Assessment Appendix C hazard identification and risk assessment makes clear for each work task the hazards and corresponding controls. The SWMS also give the controls for the work tasks.	Accepted	Draft SWMS

3	Ralph Blake	2	For the decommissioning activities what is the extent of control of ANSTO and outside contractors.	The Effective Control Plan describes the arrangement for control. Section 3 and Figure 4 describe the project organisation and this has been updated. ANSTO will control all tasks with the exception of the specialist tasks involving large lifts and the transport of the cyclotron magnetic structure to Lucas Heights. These will be managed by external specialists with involvement by ANSTO in the planning, detailed risk assessments and execution. The main ANSTO control person will be the Works Coordinator. There will be HPS present when appropriate.	Accepted	Revised ECP and SMP

4	Ralph Blake	2	What are the arrangements for training contractors.	The contractor training arrangements will follow the ANSTO requirements under Safety Standard AS 2303. Project coordination and supervisory staff will liaise with the Radiation Protection Adviser and the OHSE Adviser to determine the appropriate scope of the training. There will be Toolbox Talks with the work crews to reinforce and update the training.	Accepted	Updated SMP
5	Ralph Blake	2	What will the involvement of OHSE be during the commissioning.	It is expected that an OHSE Adviser will be assigned to support the decommissioning. The Project works coordination staff will liaise with the OHSE Adviser to agree the exact involvement. This would include involvement in SWMS and presence during relevant hazardous tasks.	Accepted.	.

6	Ralph Blake	2	Generally more information on the detail of activities and associated hazards and controls will aid the review.	This item relates to items 1 and 3. As per the response to item 1, a summary table will be made and given in an addendum to the SAC submission. There have been preliminary SWMS prepared for the removal of the GMP Hot Cells and for the work in the vault / control room areas. As per the response given in the SSR Assessment item 8 and referred to here in item 3, the large lift has been subject to a risk assessment led by an SSR officer and with the involvement of an external specialist in large lifts.	Accepted.	Updated Decommissioning Plan and prepared SWMES. Expanded explanation in the cover letter to the SAC.
7	Ralph Blake	2	The storage of waste in the basement is not well described. Part of this waste will be present from before the decommissioning.	Unused chemicals have been disposed of or returned to LHSTC. This will be further described in the Waste Management Plan.	Accepted	Updated WMP.

8	Ralph Blake	2	What is the extent of and controls for other OHS hazards e.g. noise, dust.	Noise is not anticipated as a hazard and is not listed in the SAC form as a hazard for the planned work tasks. If a noise hazard is identified in the detailed SWMS, the appropriate controls will be identified. Similarly dust is not expected to be a general problem. OHS hazards and the controls are covered in the SWMS.	Accepted.	.
9	Ralph Blake	2	What is the extent of reticulation of nitrogen and other asphyxiate gasses.	There is liquid nitrogen reticulated to a filling station in the building but this will not be decommissioned. This will be isolated at the tank outside the building during the decommissioning to eliminate any risk of leakage inside the building. As preparatory tasks in the decommissioning of the vault / beam room and decommissioning of the hot cells, all service lines including gasses will be isolated.	Accepted.	.

10	Ralph Blake	2	What is the extent of usage of flammable gasses.	There is no usage of LPG materials. There was a small cylinder of hydrogen in the vault which was used as the ion source. This will be removed before the decommissioning tasks and disposed of following Waste Operations requirements. The fire detection and suppression system will generally remain operational during decommissioning. In the Safety Assessment workshops, fire was considered as a hazard and the risk was low.	Accepted.	.
11	Ralph Blake	2	The SAC submission could make clearer that industrial risks don't involve hazardous tasks such as hot work (grinding, welding), jack picking.	The Safety Assessment report will include a statement that the industrial tasks don't involve hazardous tasks such as hot work (grinding, welding), jack picking.	Accepted.	.Revised Safety Assessment report.
12	Ralph Blake	2	The SAC submission could make clearer that a number of the dismantling tasks are maintenance tasks.	The Decommissioning Plan describes the work and does note that a number of the dismantling tasks are maintenance tasks.	Accepted.	

13	Ralph Blake	3	The positive comment was that the discussion on international best practice showed support for staged decommissioning in IAEA TECDOC 1394 which noted that regulatory bodies generally recognised that not all safety actions / documentation can be completed initially and that an action plan is a good way to manage this.	This positive comment is noted.	N/A	.
14	Mark Alexander	2	Does the package cover all the documents required in the ARPANSA licence application.	The package follows closely the format and requirements implicit in the ARPANSA Nuclear Installation licence application form RPB-LA-FORM-240C.	Accepted.	.
15	Mark Alexander	2	The internal ANSTO requirements informing outside parties of the decommissioning project are still to be established.	These requirements will be established in discussions between the Project, the Regulatory Affairs Officer and ANSTO Communications.	Accepted.	.
16	Mark Alexander	2	The relevance of the MHF legislation needs to be checked.	The relevance of the MHF legislation has been checked and it does not have any significant relevance to this decommissioning project. There will need to be a request for exemption for the future 18 MeV facility.	Accepted.	.

Effective Control Plan Ref: AC-D-LA-E6a						
17	J Perera	3	The titles of many documents refer to ANSTO Camperdown Facility Decommissioning. To prevent confusion with the new ANSTO Camperdown Facility to be constructed suggest using: *ANSTO Camperdown 30MeV Cyclotron and Radiopharmaceuticals Production Facility Decommissioning* Or similar.	The original titles of the documents referred to the Decommissioning of the NMC. This was changed to reflect that the previous Camperdown radiopharmaceuticals operations were under an NI licence and the NMC was under a PRF licence and this application is for an NI licence. It is not possible to clarify all this in the document title and it will be explained within the documents.	Accepted.	.
18	J Perera	2	Section 1 Purpose and Scope does not refer to the fact that the facility to be decommissioned is a licensed facility – a nuclear installation under ARPANSA regulations.	The purpose and scope of the documents will be changed to refer to the ARPANSA licences.	Accepted.	Licence Plans revised. Also clarified in the SAC cover letter.

19	J Perera	2	The project organisation referred to in section 3 and shown in Figure 4 seems to be relevant to the construction of the new 18MeV cyclotron facility and not the decommissioning of the existing NMC facility in Camperdown.	The project organisation described in section 3 and shown in Figure 4 will in fact be same for this decommissioning work and for the later construction of the replacement cyclotron. This is appropriate because the engineering and supervisory staff will be experienced with the site and some major tasks will be similar, for instance the large crane movements through the vault roof. There is a later version of the project organisation chart in figure which better reflects this because the title of the key local coordinating position is changed from Construction Coordinator to Works Coordinator. This figure will be updated in the plan and this will be explained further in section 3.	Accepted.	ECP revised.

20	J Perera	3	Section 3.2 paragraph 2 refers to doses to personnel from decommissioning processes and separately for decommissioning activities as listed in the in the Decommissioning plan. The difference between these two separate groups of tasks is not clear, and needs clarification.	These two references to doses are a reference to the same thing and this will be clarified in the plan. When work tasks are being referred to, the term "activities" will be avoided to avoid possible confusion with radiological activity.	Accepted.	.
21	J Perera	3	Section 6.1: Individual whole body monitoring is referred to in section 6.3 for decommissioning of SPECT cell enclosures, which I understand is not included in the first stage of decommissioning (covered by this SAC), but would include overall RP Plans for decommissioning this facility. But section 6.1 does not make any mention of whole body monitoring.	Section 6.1 is an introduction and does not give detail. The later sections including section 6.3 expand the detail and this made reference to whole body monitoring. This radiation protection plan does not cover the dose estimates or give detail on the controls for the decommissioning of the SPECT cells.	Accepted.	.

22	J Perera	2	Table 10.2 – The column headings refer to Task Group 1 Personnel and Set 1 Estimated dose microSv). What is meant by Set 1 is not clear. Presumably there are two sets of dismantling and decommissioning tasks performed by two different groups. This aspect if true has not been made clear. Table 10.3 columns have headings: Task set 2 personnel and Set 4 Estimated dose. Again inconsistent terminology and probably a typographical error “Set 4”? Needs clarification and correction	Agreed. This matter is also raised in the RPA Assessor's comments. This will be clarified with the RPA and the report clarified.	Accepted.	Revised RPP.

Safety Assessment – ANSTO/T/TN/2010-9 Rev 0						
23	J Perera	2	Section 8.2 refers to Risks of dropped loads. One of the main lifts is the cyclotron yoke using a 400 tonne mobile crane. This should be subjected to a special risk assessment involving the contractor, lifting equipment approvals officer (LEAO) & SSR.	This large lift has been subject to a HAZOP and risk assessment study (see *Memorandum dated 12 August 2010, File 10/430*) led by an SSR officer and with the involvement of an external specialist in large lifts. The recommendations will be complied with in the project. When the project is at that stage, the lift will be planned in detail with external specialist and this will include computer simulation. There will be further risk assessment equivalent to detailed SWMS with the involvement of the LEAO.	Accepted.	Risk Assessment report provided.

24	J Perera	2	Section 8.5 refers to Transport Risk. It refers to an HP surveyor taking control and giving directions to the public during a transport accident. But it does not specifically refer to HP Surveyor escorting the transport trucks. The section does not give details of the number of trips involved and the distance to be travelled.	There will be a single trip to Lucas Heights. The Lift and Transport Plan prepared by Toll Project Services gives a recommended route subject to approval by the RTA. This distance is approximately 30 km. A HPS will accompany the truck escort crew and this will be clarified in the report.	Accepted.	
Cyclotron removal and transport						
25	J Perera	2	As the cyclotron removal and related load/unload operations involve a mobile crane lift, it would require a special risk assessment and approval by the Lifting Equipment Approvals Officer. (As previously noted in comment 23).	See the response to item 23.	Accepted.	.

Note that Recommendations have been categorised in significance according to the following characteristics:

Category 1 Item with potentially significant safety significance requiring disposition prior to approval – i.e would have been a SAC condition under the previous system

Category 2 Issue requiring clarification / substantiation to support the submission;

Category 3 Minor comment which would improve the safety case e.g typographical error or incorrect name