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**ansto**

Nuclear-based science benefiting all Australians

# **ANSTO Camperdown Project Public Presentation**

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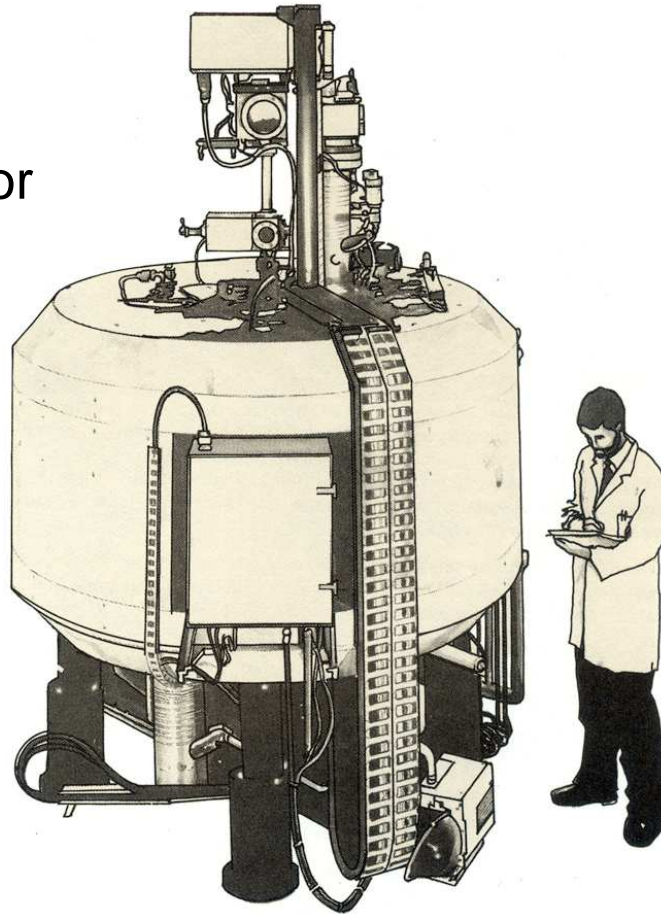
# Topics

- What is a Cyclotron?
- ANSTO Camperdown Cyclotron Facility
- Why Decommission the Facility?
- What is Involved in Decommissioning?
- Safety Planning, Reviews and Approvals
- Summary

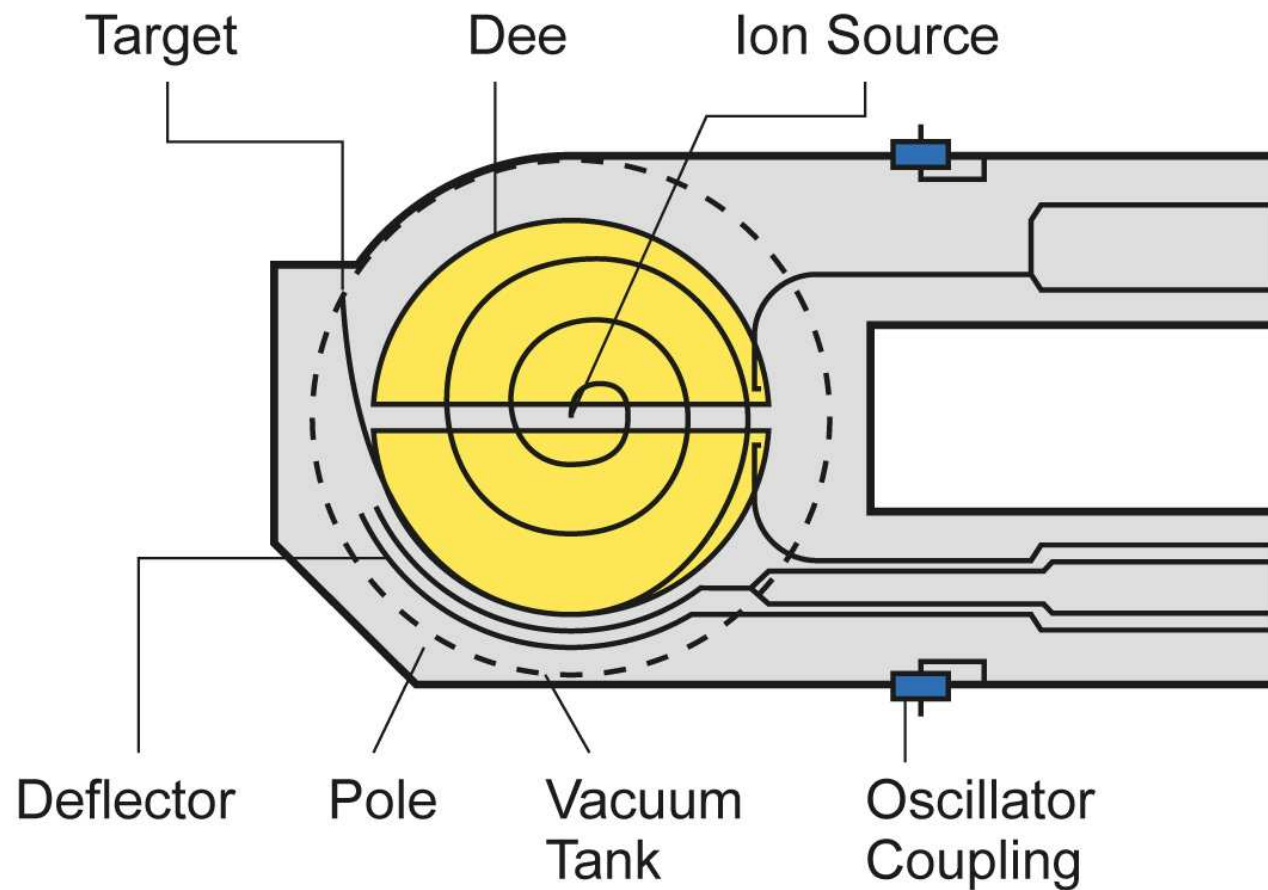
# What is a cyclotron?

Compact particle accelerator

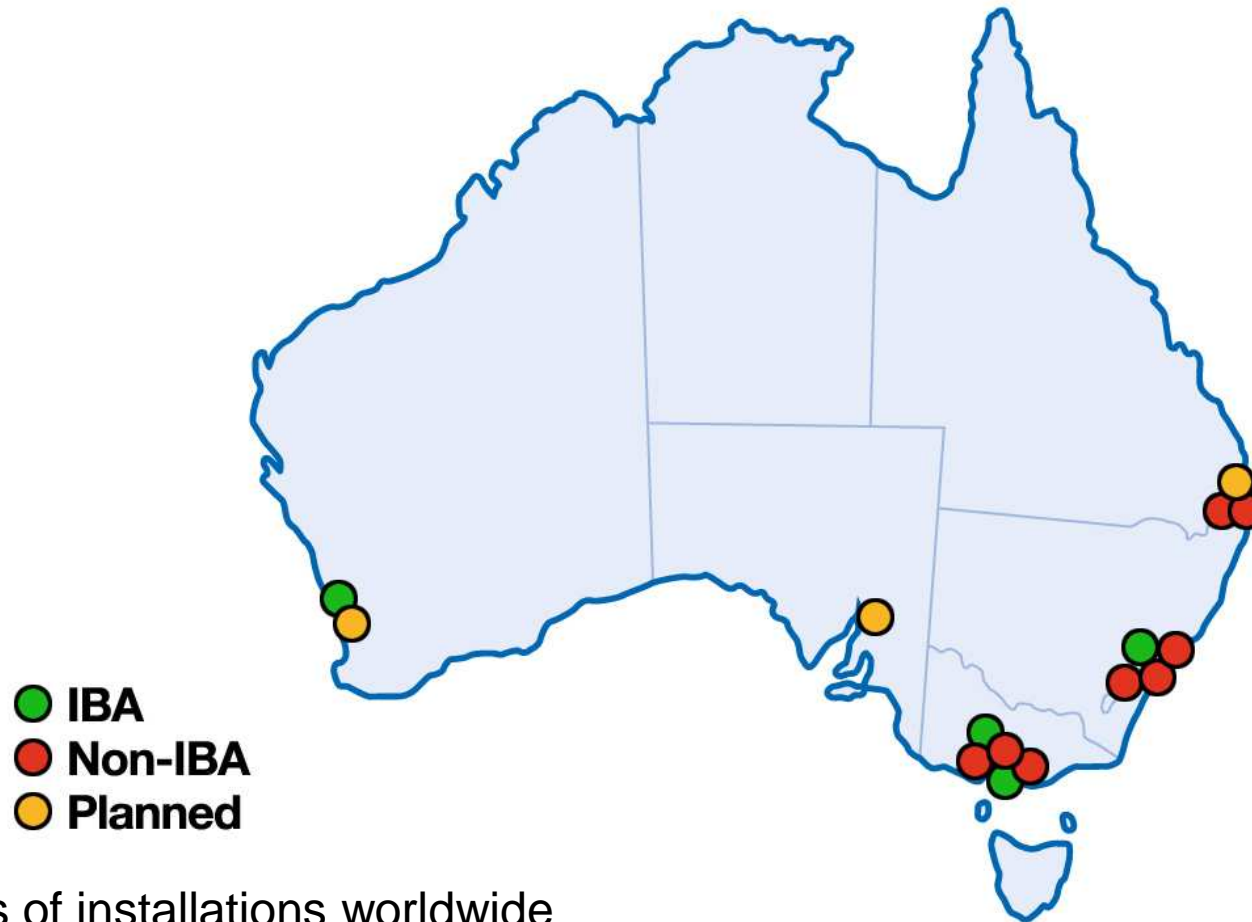
Technology mature



# What is a cyclotron?



# What is a cyclotron?



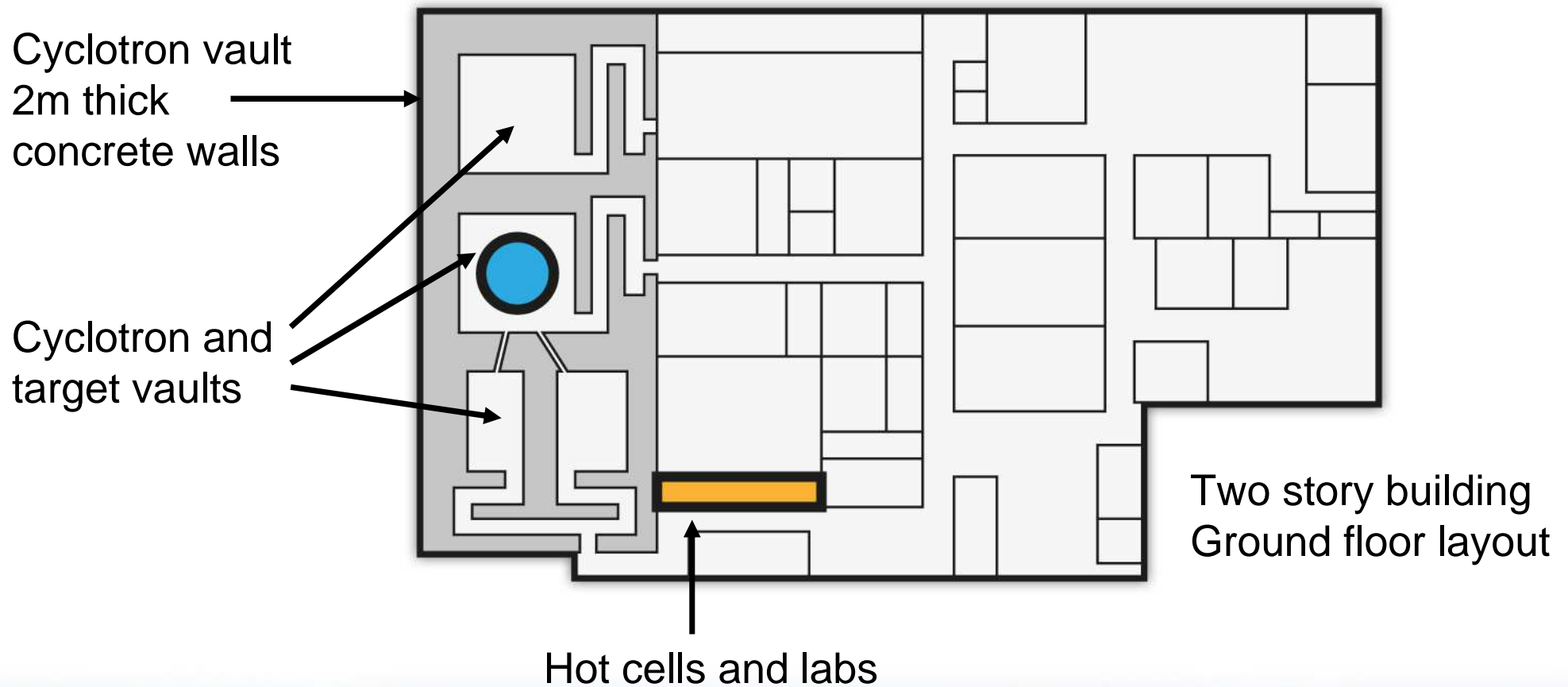
Hundreds of installations worldwide

# ANSTO Camperdown cyclotron facility

- Located at Grose St Camperdown
- Constructed in 1990
- Used to produce radio-isotopes for nuclear medicine since 1991
- Significant developments in solid target technology, with some of the lowest operational dose rates recorded in the world
- Consists of:
  - 30 MeV cyclotron, supplied to ANSTO by IBA
  - Supporting beam lines, targets and radio-isotope production laboratories



# ANSTO Camperdown cyclotron facility



# Hot cells





# Why decommission the facility?

- Operations ceased in 2009 because the Cyclotron and ancillary equipment reached the end of its useful life
- Make way for creation of National Imaging Facility Sydney Node



- Plan to install new 18 MeV cyclotron and refurbish existing laboratories for medical research
- First step is to safely decommission the existing facilities

# What is involved in decommissioning?

## Stage 1

- Dismantling of beam lines, cyclotron peripherals and target stations in cyclotron vault; and
- Dismantling and removal of the cyclotron, hot-cells, target transfer systems, and control room equipment to Lucas Heights

## Stage 2

- Dismantling and removal of additional hot-cells and beam components to Lucas Heights

# Decommissioning

## Radiological

- Any residual nuclear medicine product has decayed
- Cyclotron and target equipment have been surveyed and assessed as containing low levels of fixed radioactive material
  - Radiation level very small
    - $< 10 \mu\text{Sv/h}$  at contact
    - $< 0.5 \mu\text{Sv/h}$  at 3m (close to background)
  - Aircraft at 15 000 m =  $13 \mu\text{Sv/h}$
  - Yearly background dose =  $1500 \mu\text{Sv}$
  - Chest X-ray dose  $\sim 20 \mu\text{Sv}$
- No loose or airborne radioactive material

# Decommissioning

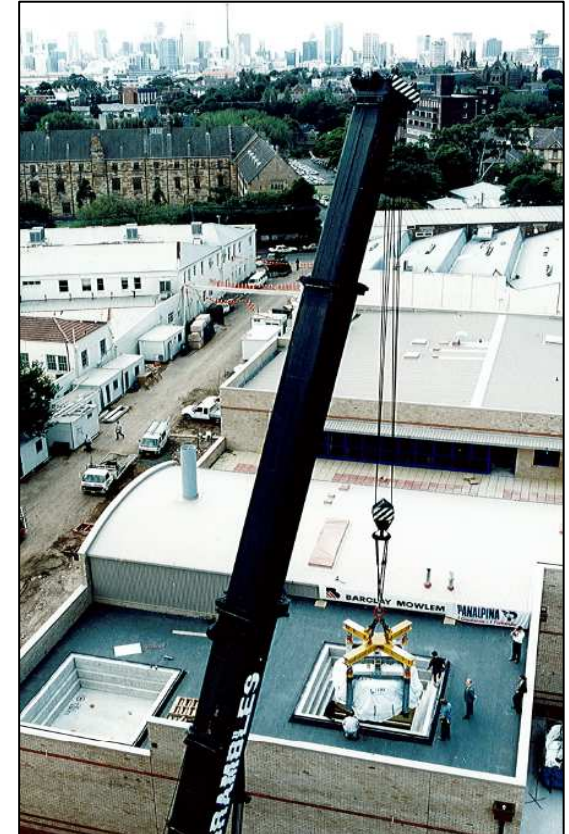
## Waste management and transport

- Standard checks for radioactivity will be applied to all decommissioned material
- All material will be transferred to ANSTO's existing Lucas Heights storage facilities, licensed by ARPANSA
- Decommissioned material will be transported in full compliance with international standards, using approved transport packages

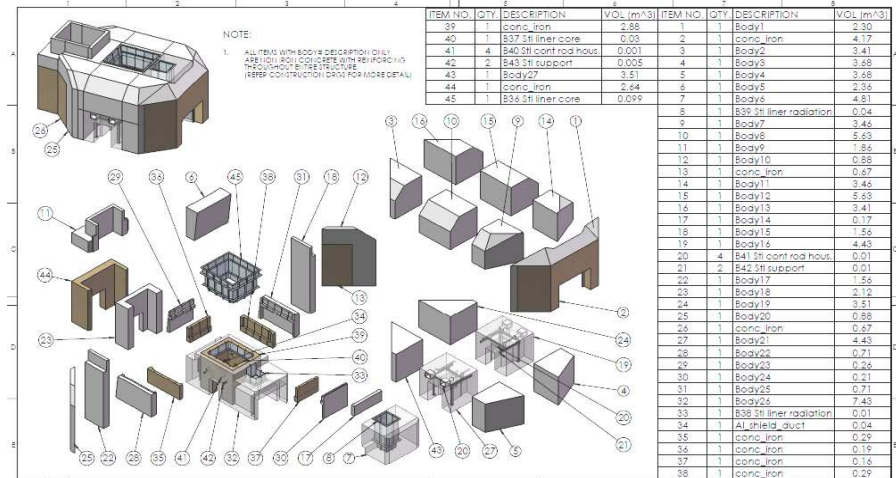
# Decommissioning

## Cyclotron lift

- The cyclotron will be removed from the building by effectively reversing the original delivery process
- The cyclotron (55 T) will be lifted out of the building through an existing covered roof opening by lifting specialists using a 400 T crane
- Crane set-up, lift and disassembly has been planned to minimise impact on local traffic and community



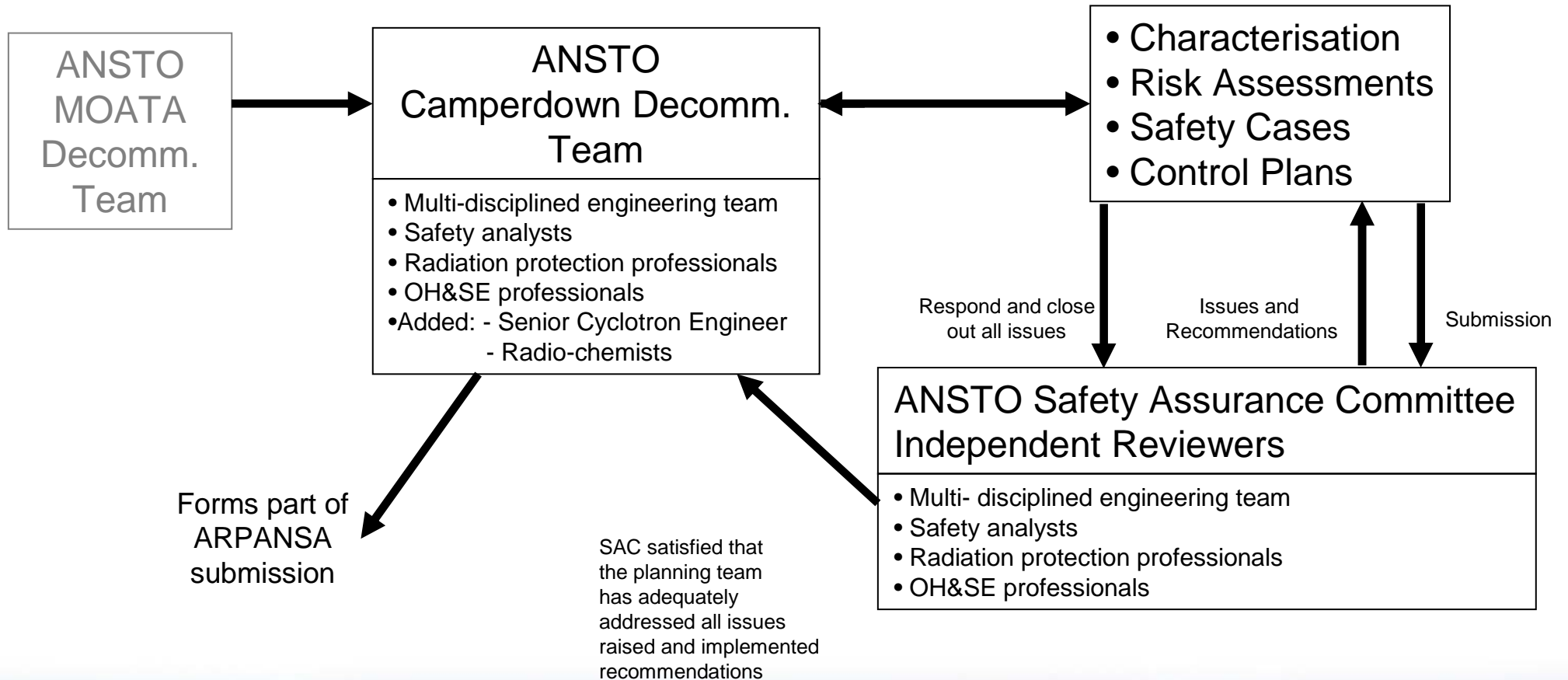
# Safety planning, reviews and approvals



Dose	ANSTO Estimated	ARPANSA Constraint	ANSTO Constraint	Actual
<b>Collective</b>	10,400 person- $\mu$ Sv	13,000 person- $\mu$ Sv	10,400 person- $\mu$ Sv	1,679 person- $\mu$ Sv
<b>Max. Individual</b>	1444 $\mu$ Sv	1750 $\mu$ Sv	1500 $\mu$ Sv	252 $\mu$ Sv
<b>Daily</b>	-	-	50 $\mu$ Sv	46 $\mu$ Sv (max)



# Safety planning, reviews and approvals



# Safety planning, reviews and approvals

## Environment

- Project has voluntarily referred to the Federal Government for consideration under Environment Protection and Biodiversity Act (EPBC)
- Determination made that environmental impact is not significant and no approval process is required

# Safety planning, reviews and approvals

## Radiation Protection

- Licence application submitted to ARPANSA, currently under review includes
  - Effective control plan
  - Safety management plan
  - Radiation protection plan
  - Radioactive waste management plan
  - Security plan
  - Emergency plan
  - Decommissioning plan and schedule

# Summary

- Risks have been thoroughly assessed and found to be minor, and reduced to a negligible level after applying standard control measures for this type of work
- There is no credible mechanism for release or radiation to have any detrimental effects to members of the project or the public
- Project has undergone significant internal reviews by independent specialists and is now being reviewed by external regulator
- Planning has been carried out to minimise any inconvenience associated with the project to the local community

**Thank you**