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# Safety and Licensing for Decommissioning

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# Outline

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- **Moata**
  - **Licensing requirements**
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  - **Licensing requirements**
  - **Lessons Learnt**

# Background (1)

## Prohibitions from ARPANS Act

- **Section 30 of the ARPANS Act prohibits Decommissioning without either of**
  - **A licence to decommission, or**
  - **An exemption**
- **ARPANS Act and Regulations structured such that separate licences needed for different phases**
- **Different licences (authorisations) can overlap**

# Background (2)

## IAEA Definition

### decommissioning

- 1. Administrative and technical actions taken to allow the removal of some or all of the *regulatory controls* from a *facility* (...).
- 2. [All steps leading to the release of a *nuclear facility*, other than a *disposal facility*, from *regulatory control*. These steps include the *processes of decontamination* and dismantling.]  
(From INFCIRC/546)

# Background (3)

## Life Phases and Licensing

### Typical phasing:

- Siting
- Construction
- Operation
- Shutdown
- Care and Maintenance
- Decommissioning

### ARPANSA Authorisations

- Siting
- Construction
- Operation
- Operation
- Decom or P&C?
- Decommissioning

# MOATA Reactor



- Argonaut type 100kW th
- High-purity nuclear grade graphite moderated & reflected
- Light Water cooled
- Concrete bio-shield – High and Low density concrete
- Approx H3.3m, W5.8m & L6.4m
- Operated from '62-'95
- In 1996, ANSTO decided to take the reactor '*out of service*'.

# Moata Licensing Requirements

- **Decommissioning Licence for Moata applied for when ARPANSA came into being (2000)**
- **In 2001, ARPANSA granted a Licence authorising ANSTO to '*Possess and Control*' and '*Decommission*' the Nuclear Installation.**
- **Fuel was removed in 2006 immediately prior to fuel shipment.**
- **In 2007, ANSTO decided to dismantle the reactor and project team was formed.**

# Moata Licensing Requirements

- **The facility was in care & maintenance mode (i.e., *Possess and Control*) until 2007.**
- **Since the initial authorisation was granted to ‘*Decommission*’ the reactor without a complete safety case, ANSTO needed to make series of Regulation 51 submissions to ARPANSA to dismantle the facility.**
  - **Approval for core drilling to characterise the facility,**
  - **Approval for preliminary dismantling, and**
  - **Approval for final dismantling.**
- **ARPANSA provided advice on submission ‘expectations’**



# Moata Licensing Requirements

1. An updated safety case
2. Management structure and responsibilities
3. Resource plans that support the proposal
4. Training plans related to the activities to be undertaken
5. Radioactive waste management plan
6. Safety management plan
7. Radiation protection plan
8. Security plan
9. Details of the decommissioning techniques to be used
10. Decontamination measures that are proposed
11. Detailed Schedule

# Moata Licensing Requirements

- In May 2007, ARPANSA approved ANSTO's Characterisation including core drilling submission.
- 50 mm dia. drilling was performed to a depth of activated zone.
- Approval for Pre-dismantling actions submission made to ARPANSA in early 2009. It included the removal of:
  - Control rods and drive assemblies.
  - Graphite moderator
  - Aluminum core tank
  - Steel core support frame
  - Lead gamma curtain



# Moata Licensing Requirements

- **Pre-dismantling action completed within 3 weeks**
- **Doses to operators were within the prediction.**
- **Submission for Final Dismantling was made to ARPANSA in October 2009.**
- **Approval granted in January 2010 with some conditions where ANSTO required to notify the Regulator some milestones.**
  - **Notification – 2 day prior to the start of actual dismantling action**
  - **Notification – prior to re-lay the floor**
  - **Notification – prior to leaving site any vehicle with cleared waste**
  - **Notification – if dose uptake exceeds 25%**

# Moata Licensing Requirements

- **Site Restoration Plan along with criteria for site survey submitted ARPANSA at the time of Final Dismantling submission.**
- **No area should have a background dose of  $\geq 0.5 \mu\text{Sv/h}$ .**
- **Decontamination, Tent removal & Site Restoration – End Aug**
- **Released from the regulatory control in late 2010 for use by other tenants at ANSTO.**

# Moata Lessons Learnt

- **Some uncertainty about expectations – Rectified by round table meeting and follow up formal communications with regulator**
- **Pre-dismantling submission withdrawn by ANSTO**
  - **Initial submission had not included an estimated cumulative dose**
  - **Submission structure**

# HIFAR Issues

- Some final shutdown operations completed under operating licence
- Question then what type of licence for Care and Maintenance
  - Dilemma
  - Ops licence not appropriate for activities planned in C&M
  - Decom licence not really warranted (?) as dismantling of significant activity not planned at this stage
- Possess and Control Licence applied for May 2008

# HIFAR Licensing Requirements

- **Plans and Arrangements for Possess and Control application**
  - General information
  - Detailed description
  - (a) effective control plan;
  - (b) safety management plan;
  - (c) radiation protection plan;
  - (d) radioactive waste management plan;
  - (e) security plan;
  - (f) emergency plan.
  - 13 criticality safety.
  - 14 safe storage of controlled material and
  - 15 maintenance plan.

# HIFAR Lessons Learnt

- **Regulator felt application did not fully describe intended final state while in C&M**
- **Scope & Boundaries of non-active dismantling**
  - **Storage Block #1 Cooling system (external)**
  - **Ion exchange column**
- **All comes down to**
  - **Better communication with regulator!**



The logo for Ansto, featuring the word "Ansto" in a bold, white, sans-serif font. The letter "A" is stylized with a white dot and a horizontal line, resembling a nuclear symbol or a stylized atom. The background is a vibrant blue with abstract, flowing light trails that create a sense of motion and energy.

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