HIFAR

- 10 MW Materials Test Reactor utilising 25 fuel elements cooled and moderated by heavy water (D2O)
- Medical radioisotopes
- Silicon Irradiation
- Industrial radioisotopes
- Irradiated materials research
- Neutron beams
- NAA
HIFAR

- 10MW operation from 1960 to 2007
- Original estimated life of 15 years based on anticipated corrosion rate of the aluminium tank (RAT)
- Reactor building steel shell is 21m tall and 21m diameter
HIFAR

- Biological shield is decagonal, 6.7m across flats and 5.9m high
- Total block mass 817 t
- RAT surrounded by 30 tonnes of graphite
- 6 Control Arms (Cadmium/Europium)
- 2 Safety Rods (Cadmium)
- Peak thermal neutron flux of 1.4e14 n cm\(^{-2}\) s\(^{-1}\)
- Total energy created 130,000 MW-days
HIFAR

- Neutron scattering facilities
HIFAR Decommissioning

- Phase A – Closure
  - Part 1 – Shutdown, remove fuel, water, rigs
  - Part 2 – Preliminary dismantling
  - Part 3 – Refurbishing

- Phase B – Care & Maintenance

- Phase C – Decommissioning
  - Part 1 – Preparation for dismantling
  - Part 2 – Dismantling

- Phase D – Return to Green/Brown Field
Current Staffing (12)

- HIFAR Manager: Daniel Pond
- HIFAR Site Supervisor: John Wernej
- Project Officer (Mechanical): Hugo Rivera
- Project Officer (Electrical): Bernie Felkins
- Information Management Consultant: Richard Healy
- Information Management Assistants: Andrew Healy & Thomas Young
- Supervisor Active Handling: Brad Ryan
- Electrical Fitter/Maintenance Planner: Don Leitch
- Mechanical Fitter/Maintenance Planner: Bill Gamblin
- HIFAR Technical Expert: Pertti Sirkka
- HIFAR Waste Process Engineer: Brett Taylor (starting May 2012)
HIFAR Organisation Chart

GM, Nuclear Operations

Manager, Waste Operations (Facility License Nominee)

Manager, HIFAR (HIFAR Facility Officer) (HIFAR Licensing Officer)

Leader, Compliance Management

Project Officers

Site Supervisor, HIFAR (HIFAR Area Supervisor)

HIFAR Maintenance Group

HIFAR Supervisor Active Handling
Related Staffing

- **Facilities Management**
  - Maintenance, Inspections
  - Supervision

- **Waste Operations**
  - Decontamination & Waste Management

- **MPDO**
  - Planning, implementation, supervision

- **Systems Safety and Reliability**
  - Safety Assessments & Licensing

- **Public Affairs**
  - Legal & Regulations

- **Reactor Operations**
  - Maintenance & dismantling
  - Shielding and activity calculations

- **Engineering & Capital Programs**
  - Drafting, SAPO, Records Management

- **SERA**
  - OH&S advice & Health Physics
Day to Day Activities

- No shift staffing – facility is staffed Mon-Fri during routine business hours only
- Operations / General Administration
- Active Handler & Site Supervisor perform daily check (safety & operability)
- Routine maintenance and defect repairs
- Health physics surveys fortnightly (or before/after work)
- Remote check of environment prior to entry to HIFAR
- Regular monitoring of environmental parameters
- Projects – Refurbishment & Dismantling
  - Preparation of project documentation
  - Implementation of projects
HIFAR Decommissioning – Approximate Timetable

• Phase A – Closure - Jan 2007 to June 2012
  • FRJ-2 DLA translation – Jan 2012

• Phase B – 2012 to 2016
  • Characterisation – Jul 2012 – Jun 2014

• ARPANSA Licence approval – Jun 2016

• Phase C – Decommissioning – 2016 to 2018

• Phase D – Green/Brown field – 2019

• NRWMF Construction – 2020
Phase A

• Part 1 – Shutdown & removal of fuel, rigs, targets, absorbers and water. Minimisation of nuclear material, fire loading and safety hazards without making modification to plant.
• Part 2 – Preliminary dismantling of selected redundant plant. Reduce footprint, minimise hazards (electrical, confined space, fire loading, contaminants/radiation).
• Part 3 – Installation and commissioning of refurbished plant. Reduce maintenance & operational costs, increase safety.
Milestones Since Shutdown

- Jan 07  Shutdown
- Feb 07  Fuel elements transferred to No.1 Storage Block
- Mar 07  Core fully unloaded to No.1 Storage Block
- Apr 07  Fuel shearing and removal of all fuel from HIFAR
- May 07  Heavy water drained from reactor (10.4t)
- May 07  Initial Possess or Control Licence application
- Jun 07  24hr shift staffing ceased
- Nov 07  Last control arm removed
- Jun 08  Remaining cobalt 60 targets removed
Milestones Since Shutdown

• Sep 08 Possess and Control Licence granted
• Apr 09 3D laser scan of HIFAR
• Mar 09 Spent fuel shipped overseas
• Mar 11 HIFAR cranes disabled (except Polar crane)
• Mar 11 Last Registered Radiation Source Removed from HIFAR
• Sep 11 Transfer of maintenance from Mainpac to SAP
• Sep 11 Evaporative drying of No.1 Storage Block Fuel Element Tank is now completed
• Dec 11 Recruitment of new (old) maintenance group
On going Operational Work

• Gradual Tritium reduction from 01 & 02 circuits via Active Extract stack release.
  Each week a 120 minute purge through the Active Extract System is performed
• Records Rationalisation
  • Registration of hard and soft copy records
  • Classification of records (more than security classification)
  • Optical Character Recognition Scanning of records
  • Disposal of duplicate records
• Maintenance work
• Projects
  • Refurbishment
  • Dismantling
• Upgrade of HIFAR Records Repositories
• Revision of HIFAR QMS
• Revision of HIFAR Plans and Arrangements
• HIFAR Decommissioning Scoping Project
The 4-weekly notification level for B15A/TRITIUM is 2.00E+03 GBq

Max: 4.81E+01 GBq

4Week Rolling: 7.17E+01 GBq

The 4-weekly notification level for B15A/TRITIUM is 2.00E+03 GBq
Future Activities

- Dismantling Projects
- Closeout of Refurbishment Projects
- HIFAR Characterisation
- Class C Decommissioning Cost Estimate
- Mobilisation of Core Decommissioning Team
- Mobilisation of Decommissioning Team
- Decommissioning Licence Application
- Purchase of Decommissioning Plant & Equipment
- Purchase of Waste Packages
- Recruitment and Training of Decommissioning Personnel
- Decommissioning
Safety Incidents since Shutdown

- HIFAR staff member becoming trapped in the B42 Personnel Air Lock
- Contractor driving a forklift over concrete and steel trench covers resulting in broken and buckled trench covers
- Unsecured roof sheet metal being blown away by wind gusts
Timeframe

- Characterisation - 2 years
- Decommissioning planning - 2 years
- Environmental approval process - Up to 1 year
- Licence application: prepare and approve - 1 year
- Technical staff recruitment and training - 1 year
- Equipment and plant procurement - 1.5 years
- Dismantling of reactor - 1 year
- Site clean-up and decom report - 0.5 years
- Decommissioning Period - 6.5 years
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Nuclear-based science benefiting all Australians