# Presentation to Harwell Site Stakeholder Group

## B220 Radiochemical Facility Harwell

## 1946-2023

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02/11/23

NDA | NRS Nuclear Restoration Services

# B220 Front view 1970’s

# The beginning of Harwell

- Decision to establish Atomic Energy Research Establishment, at RAF Harwell Berkshire, 1945.
- “ to set up a research and experimental establishment covering all aspects of the use of atomic energy”
- Site open from 1st January 1946

# Chemical Problems associated with atomic power

- Uranium and plutonium fuels.
- Reprocessing and plutonium preparation.
- Fuel performance, under normal operation and accident conditions.
- Reactor coolant.
- Radioactive waste treatment.
- Actinide chemistry.
- Analysis.
- Radiation chemistry.

# B220 under construction

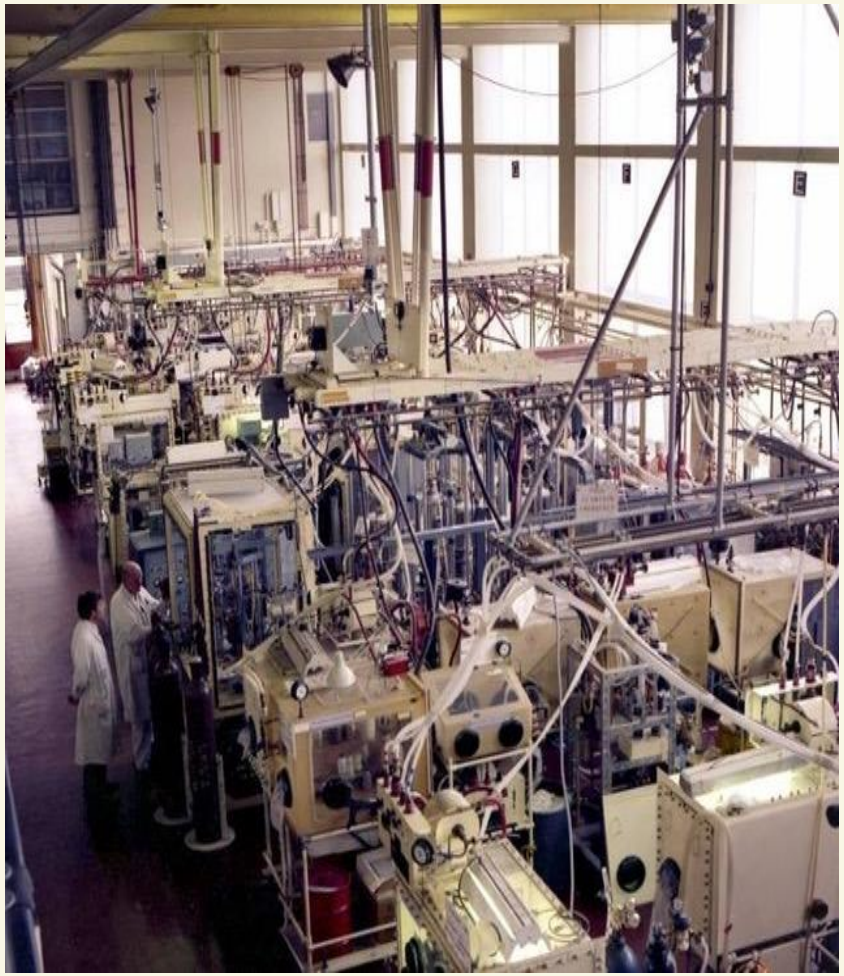

# Operational January 1949

# BETA wing laboratory 1949

Hot lab : radiochemistry in Building 220, 1949

# First floor ventilation trunking and services

# B220.8 Glove box hall



# Glove box activities

# HERMES (Heavy Element and Radioactive Material Electromagnetic Separator)

# Extensions to B220 over the decades

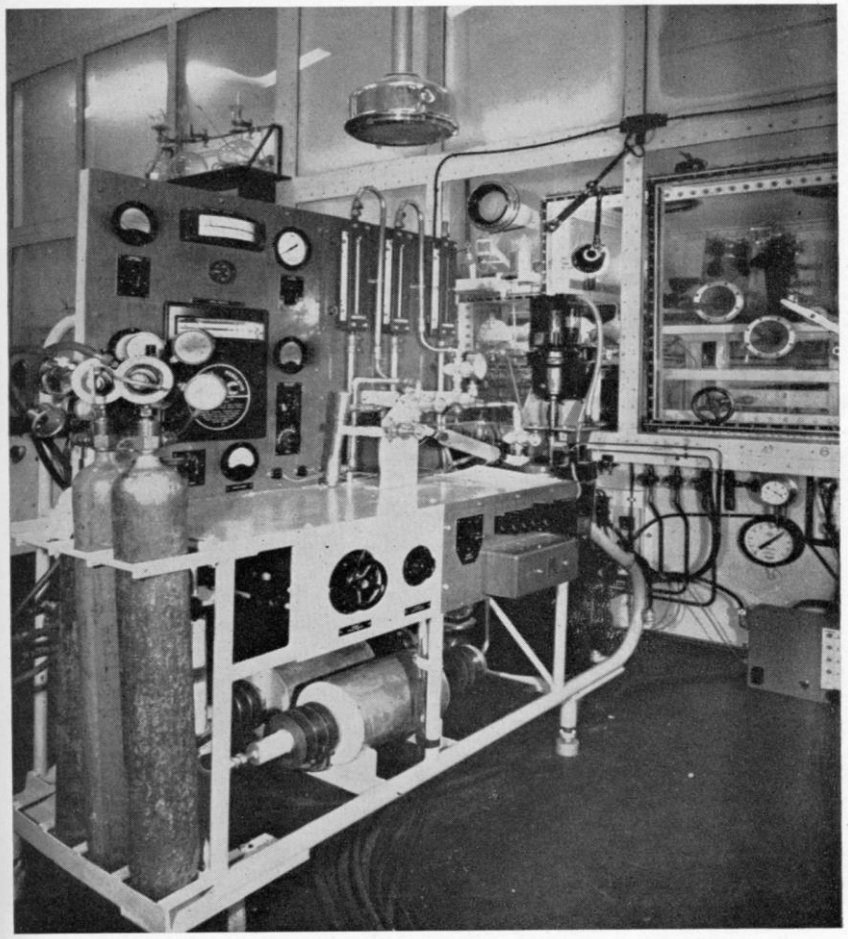
- B220.7 Shielded cells
- B220.8 Extension for plutonium work
- B220.29 remote handling facility , opened 1986
- New electrical supplies and filtered general extract
- Various office extensions.

# Plutonium metal (December 1951)

When it had been safely wrapped in a polythene bag it was passed from hand to hand so that people could feel its radioactive warmth.”

Small quantities available for trials.
Utilised large fixed glove boxes, “shop windows”.
Two rows of floor to ceiling glove boxes with a pressurised suit area between the rows.

Five allotropic forms.
Properties published in Nature, March1954
“following a recent declassification decision”.



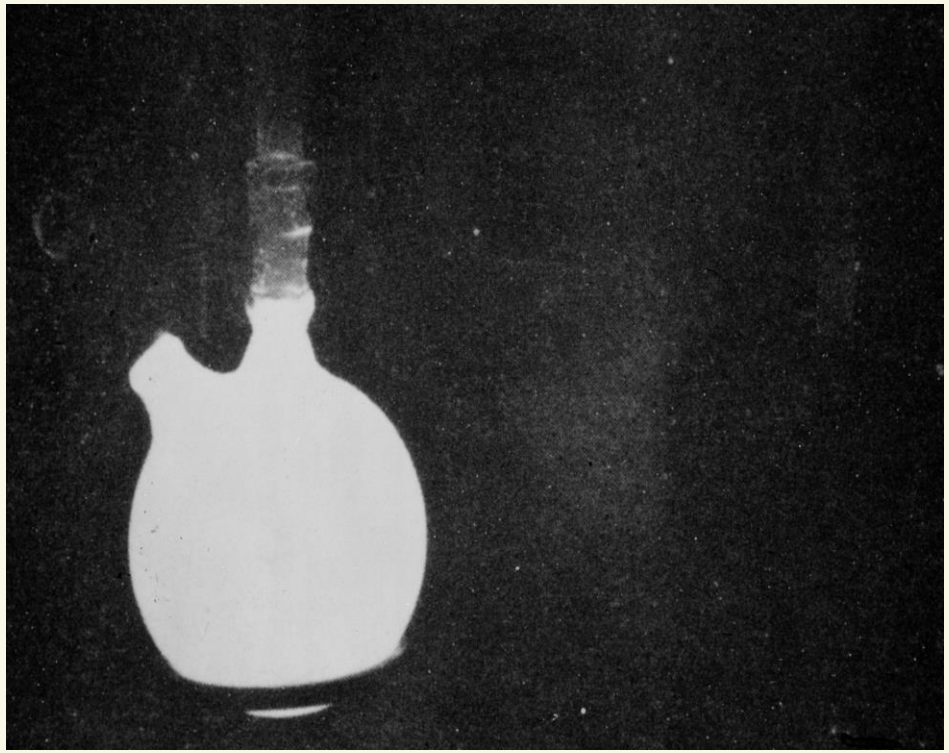
Remotely controlled pilot plant for plutonium metal production
(*see* page 367)

# Radioactive element research

“about 14 new or virtually new elements have been made available for chemical investigation since 1939, making perhaps the greatest accession to inorganic chemistry for over fifty years”
Major studies in B220 covering the actinides.

**Protactinium**
Separated from uranium production wastes.
60 te sludge processed to give 125g Pa.
Extensive  studies on chemistry.

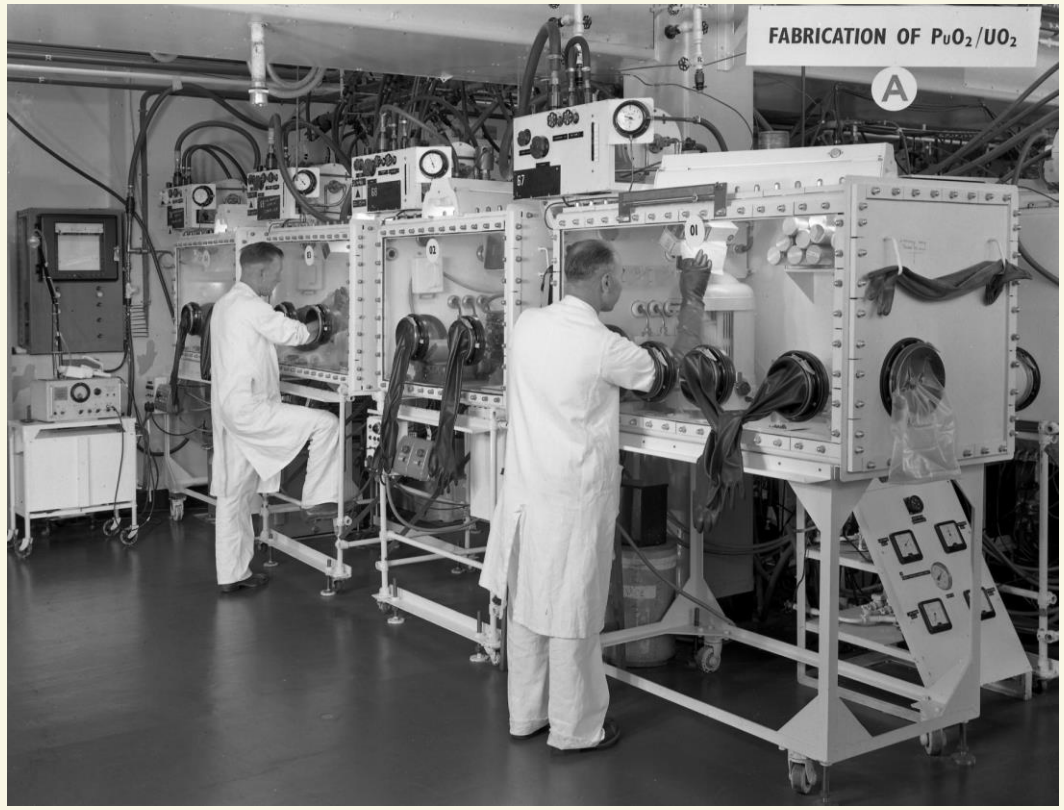
**Flask Containing Polonium**



VACUUM LINE FOR FLUORINE WORK

# Fuel Research

- $UO_2$ for AGR reactors.
- $(U,Pu)O_2$ for fast reactor.
- (U,Pu)C for advanced fast reactors.
- Physical properties.
- Chemical structures.
- Thermodynamic properties.
- Fabrication.



# VIP visits

# RSC landmark award 2009

# B220 Post 1990

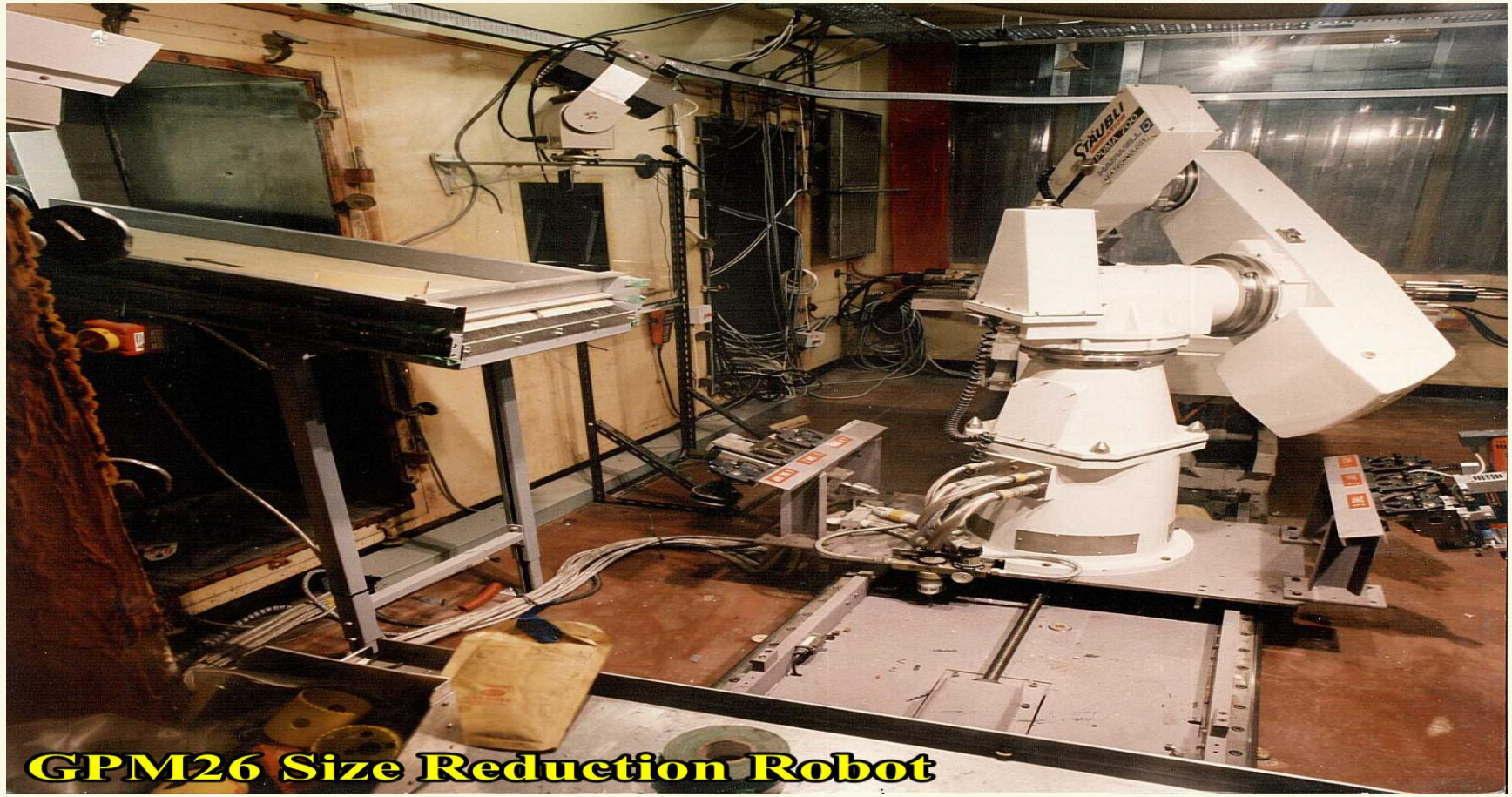
- Leased to AEA Technology from 1996 to 2004.
- Commercial Medical/Industrial Radioactive Source Production.
- Extensive Decommissioning Activities from 1990 onwards

# Decommissioning

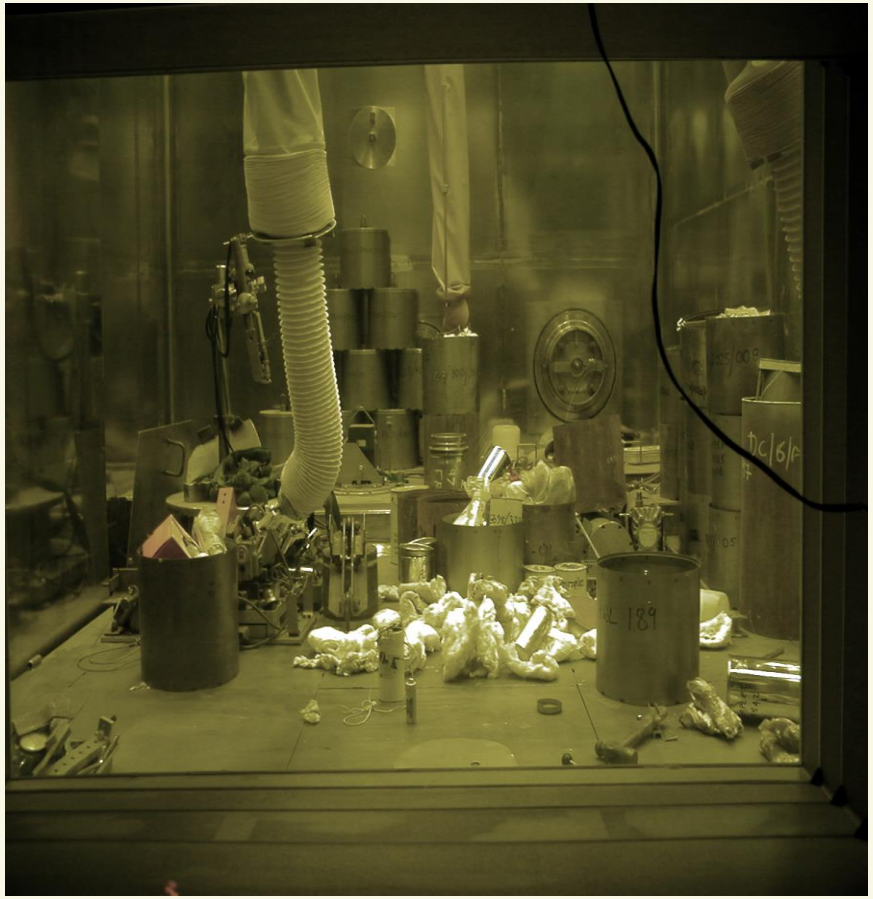
Modular containment systems

Pressurised suit work

# Decommissioning



# Cell clearance B220.29



# Office block demolition

# The way forward 2023

- Radiological characterisation of the facility to allow accurate final decommissioning estimates.

- Upgrading of existing ventilation,fire detection and electrical systems to align with decommissioning activities

# Thank you – any questions?