The UK Tritium Users' Group
and Aspects of Tritium Monitoring at AWE

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ARMUG Meeting NPL - Nov'05

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UK Tritium Users Group

History of the Group

- Following a meeting of the US Tritium Focus Group:
  - AWE proposed a UK version with GE Healthcare (Amersham).
- 1st Meeting held Jun'03 at AWE
  - 6 Organisations represented
- 5th Meeting at Dounreay (Oct'05)
  - Current number of organisations = 18

Objectives

- Purpose
  - The Tritium Users Group (TUG) provides a forum for the exchange of information on topics of common interest to the UK Tritium community.
- Goals
  - To develop a more integrated, open UK Tritium community able to utilise available expertise and share experience with the common aim of improving safety, cost effectiveness and environmental impact of tritium operations.

Scope of Interest

- the design, commissioning, operation, maintenance and decommissioning of plant and processes
- equipment and materials evaluations
- container design and approvals
- tritium monitoring, measurement and accountancy
- waste assay
- waste disposal
- supplier performance
- data acquisition and system control
- training methods
- risk assessments
- emergency response
- health physics issues
- Regulator issues (EA, NII)

Tritium Monitoring at AWE

Anne-Marie Saunders

Radiological Instrumentation Services

Tritium Facilities

- New Tritium processing facilities
- Old Tritium processing facilities
  - Undergoing decommissioning
- Multi-isotope processing facility (HT & α)
  - Undergoing decommissioning
- Storage facilities
- Test facilities
  - Short-duration monitoring

System Overview

- Workspace
- Surveying
- Stack Monitoring

- *Fume cupboard/Airbox containments*
- *Inert gas Glovebox containments*
- *Process*
- *Gas clean-up system (GCUS)*

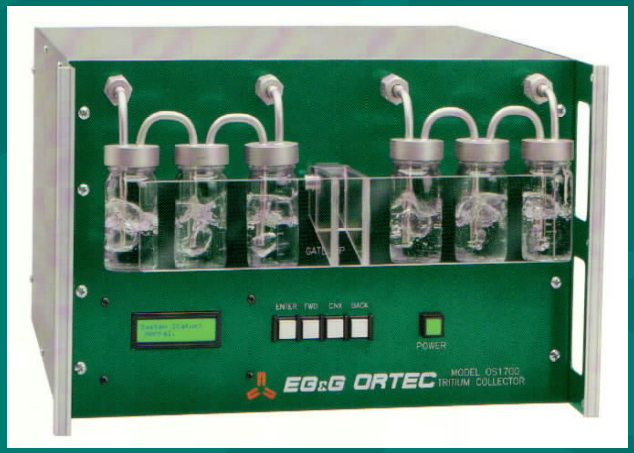
Installed Instruments

- Overhoff T401
  - 2l flow-through ion chamber
    - Workspace
    - Fume cupboards/Airbox containments
    - Stack monitoring
- Harwell T18
  - 2l flow-through ion chamber
    - Workspace
    - Stack monitoring
  - 2l diffusion ion chamber
    - Workspace
  - 0.5l diffusion ion chamber
    - Fume cupboard/Airbox & Inert glovebox containments
    - Gas clean-up system

Stack Monitoring

- Real-time - Ion chamber with integrator
- Passive sampling - regulatory monitoring

Bubbler
gaseous emissions



SAS units
particulate emissions

- Test & Calibration

Surveying

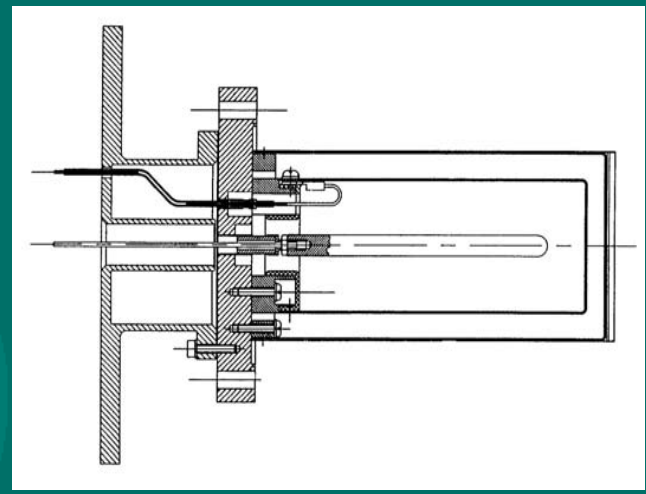
- Smear counters - gas proportional counters
  - surface monitoring
  - short turn-around/health-check
- Portable ion chamber monitors
  - 394C, T401, NIS221
  - airborne contamination survey
  - LLW assessment
- Liquid scintillation counters
  - lower MDA than smear counters
  - smear papers and bubbler samples

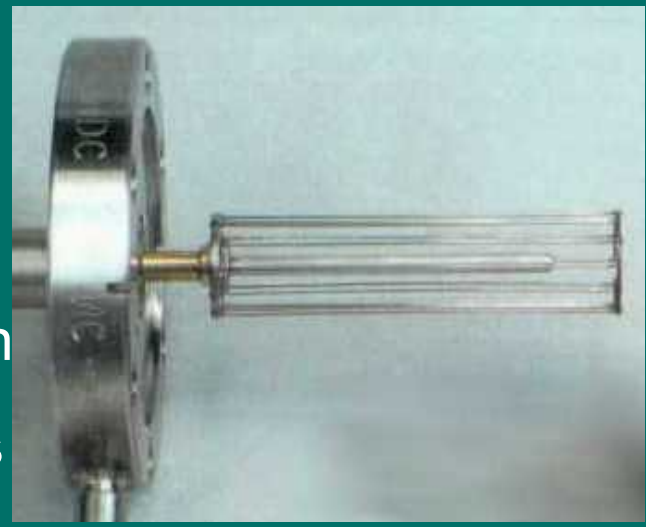
Calibration & Servicing

- Philosophy
  - RSA ‘93 & IRR ‘99
  - NII licence conditions
  - CEAR & EMIT
  - M11 compliance/BPM/BEPO
- Routine tasks
  - Annual calibration
  - Preventative action
- Breakdowns
  - Service agreements

Ion chamber construction

- Stainless Steel
  - long-term usage, minimal hold-up
- Aluminium Alloy
  - significant hold-up
- Gold-plated
  - reduced hold-up
- Virtual Wall
  - trial ongoing - initial results promisin
  - roll-out use in high activity locations





Summary

- UK Tritium Users Group Growing
- Covering many topics from design - decommissioning

- AWE
  - Many decades experience of tritium operations
  - Dedicated team for Radiological Instruments supporting facility operations.