IRPA13
SECC, Glasgow, Scotland
May 13-18, 2012

Effect of RP Policies & Work Programme on Radiological Measurements at the Dounreay Site

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This poster looks at the trends in radiological measurements at the Dounreay Site and considers what changes in the work practices can be correlated with the measurement trends

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Developments in Radiological control

Engineered improvements – improvements in ventilation and containment

Procedural improvements – zero tolerance to loose contamination, single use PPE, RP training, risk assessment focus IRR99, hierarchy of control philosophy

Decommissioning – reduction in contamination moderate areas, clean up of fixed contamination, facilities cleaned up and shut down

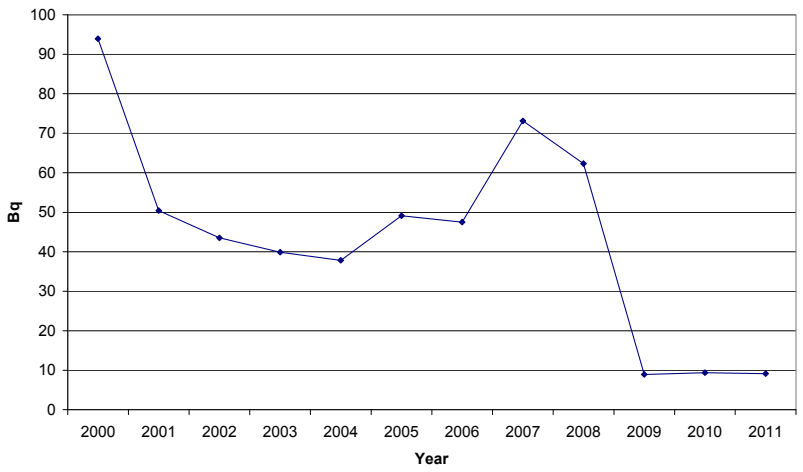
^{137}Cs - whole body monitor

^{137}Cs body content measured annually for selected workers.

Presence of ^{137}Cs affected by:

- Work place intakes
- ^{137}Cs in the environment from Chernobyl fallout

Mean Caesium -137 Whole Body Monitor Results



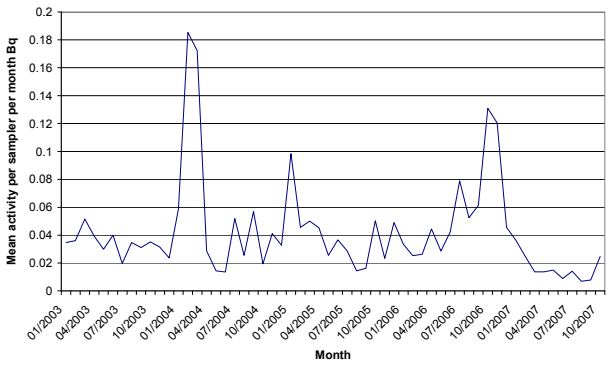
2000 to 2004 – drop in ^{137}Cs due to reduction of environmental ^{137}Cs

2005 to 2008 – increase in ^{137}Cs due to clean up work in the Dounreay cementation plant.

2009 onwards - very low ^{137}Cs; clean up work finished, environmental ^{137}Cs reduced

Uranium air sampler results

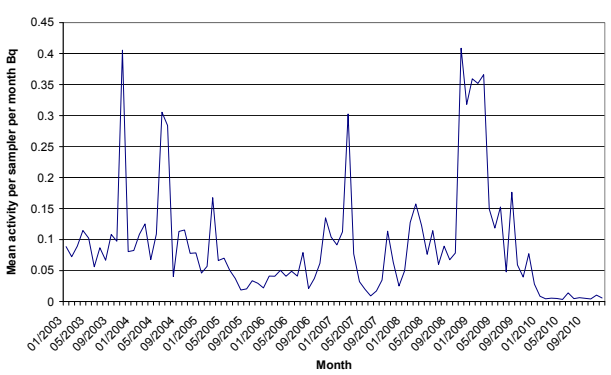
Research reactor fuel fabrication plant mean activity per position per month



2004 spike - last production run of fuel.

2007 spike- decommissioning work prior to demolition.

Uranium billet production plant mean activity per position per month



2009 - decommissioning of a heavily contaminated area of plant

Uranium in urine

Mean uranium in urine results

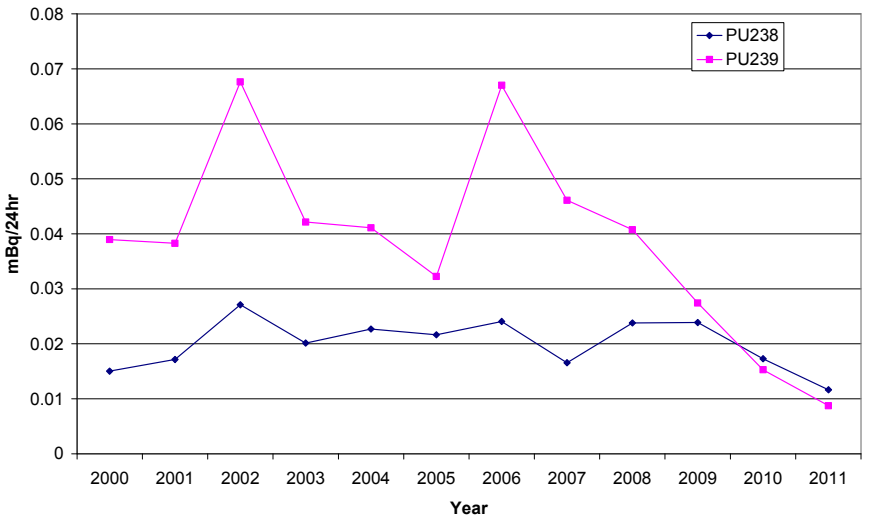
Random increase and decrease in results from year to year

General downward trend

Uranium plant decommissioning does not appear to affect urine results -suggests that the RP measures effective.

Plutonium in urine

Mean plutonium in urine results



2002 ^{239}Pu peak – ventilation strip out work in PIE facility now used for waste processing.

2006 ^{239}Pu peak the Pulsed Column Laboratory decommissioning.

2007 onwards -General downward trend in ^{239}Pu

To 2009 - level of ^{239}Pu is consistently above ^{238}Pu

2010 and 2011 - low level of ^{239}Pu matches the level of ^{238}Pu.

Conclusions

Over the period of time reviewed the three methods of measuring exposure show an overall decrease of radionuclide intake.

Despite both ^{137}Cs and uranium measurements being affected by diet it is possible to see trends in the workplace intakes.

Results of all three measurement methods can be match to campaigns of work identified on the Dounreay Site

The global radiological measurements give an insight into intakes in the general working population of the Dounreay site which is not possible with the individual results.