



National Physical Laboratory

Update on NPL waste-drum comparisons

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Overview

- ❑ **2007 exercise summary**
- ❑ **2009 exercise details**
- ❑ **2009 exercise timetable**
- ❑ **2011 exercise – provisional details**



2007 exercise summary

- NPL ran first 'drum comparison' exercise in 2007

- Need determined at 2005 workshop on metrology for decommissioning

- ²⁴¹Am, ¹³⁷Cs and ⁶⁰Co
- < 0.4 Bq g⁻¹
- concrete or soft waste
- 200 L drum format

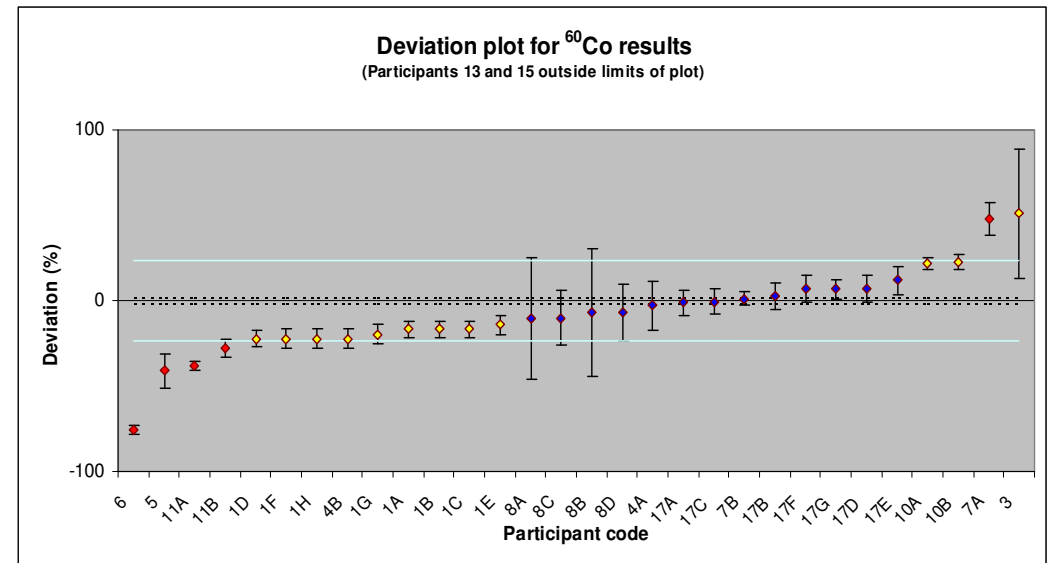


2007 exercise summary

- **18 UK laboratories participated**
- **Drum circulated site-to-site (early 2007)**
- **Follow-up workshop (September 2007)**
- **Final report (NPL Report IR 2) (November 2007)**

2007 exercise summary

- 58% of total data set 'in agreement' with NPL
- 15% of data discrepant or questionable for no clear reason
- ^{137}Cs and ^{60}Co – low activities and 'layering' of drum caused problems
- Second comparison requested (drum with 'hotspot')



2009 exercise details

1. Prepared drum (coded 'Drum A') as follows:
 - Single 500ml bottle of resin spiked (homogeneously) with ^{241}Am , ^{137}Cs and ^{60}Co and positioned near drum wall
 - Remainder of drum volume filled out with 500ml bottles of inactive vermiculite
 - Activity concentration (averaged over drums' contents) was in range $0.10 - 0.35 \text{ Bq g}^{-1}$
2. 'Drum A' circulated to interested labs
3. Resin bottle replaced with more active bottle to produce 'Drum B' ($5 - 20 \text{ Bq g}^{-1}$)
4. 'Drum B' circulated to interested labs

2009 exercise details

- **Prior to circulating each drum:**
 - **Nuclides present, activity concentration range and details of (empty) drum, resin and bottles were disclosed**
 - **Size and position of ‘hot volume’ were not disclosed**
- **After the initial results deadline, details of the hot volume were disclosed to all labs, and ‘second round’ of results invited**
 - **Would enable labs to submit data for two different measurement scenarios**
 - **Results from the two scenarios would be analysed separately**

2009 exercise timetable

- **Early 2009:** Drum A prepared
- **March – August 2009:** Drum A circulated (9 UK + 1 overseas lab)
- **September 2009:** Drum B prepared
- **September – November:** Drum B circulated (12 UK + 2 overseas labs)
- **20 November:** First results deadline
- **1 December:** Hot volume details disclosed
- **17 December:** Second results deadline

- **January 2010:** Draft report to be issued (in hand)
- **25 February 2010:** Workshop
- **March or April:** Final report to go on NPL website

2011 exercise - provisional details

- **Subject to confirmation from NMO, third exercise will run in period October 2010 – September 2011**
- **If confirmed, likely that drum (or other package type?) would be circulated during first half of 2011, with workshop around July**
- **Expressions of interest in participation welcome at any time!**
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