

# Intercomparison cancelled!

Pete Burgess

# Why?

- We were going to run another contam monitor testing intercomparison.
- But we're not.
- The last intercomparison showed no improvement on the previous one.
- So we're going to find out why the results are so variable.

## Previous intercomparison

- Mini 900 + EP15 for betas (and alphas)
- Mini 900 + 44

**Table 1. Summary of Results for EP15 Calibrations**

Nuclide	Mean Instrument Response (Emissions) 2005	Spread in 2005	Spread in 2000	Spread in 1993
$^{14}\text{C}$	2.9	52 %	46 %	40 %
$^{36}\text{Cl}$	8.2	29 %	42 %	19 %
$^{60}\text{Co}$	5.6	16 %	-	-
$^{90}\text{Sr} + ^{90}\text{Y}$	8.7	20 %	31 %	16 %
$^{137}\text{Cs}$	7.5	33 %	-	-
$^{147}\text{Pm}$	4.0	26 %	-	43 %
$^{241}\text{Am}$	5.2	37 %	28 %	15 %

## We propose, as sources of variation

- The instrument reading precision
- Instrument non-linearity
- Statistical fluctuation
- Background correction
- Instrument stability
- Source to detector distance
- Source non-uniformity
- Spectral variations
- Incorrect emission rate

# Review of existing equipment

- Linearity of existing equipment
  - Check electrically
  - Account for dead time using well-known dose rate fields
- Stability – check influence of zero adjustment, temperature dependence and battery dependence
- Parallax – check over a reasonable angle

# Identification of causes

- The instrument reading precision
- Instrument non-linearity
- Statistical fluctuation
- Background correction
- Temperature stability

Will all be addressed using the same detector connected to a digital scaler – timer

- Measurements over the complete source with the detectors in virtual contact and using a long term average
- Local (cm to cm) variation can be checked using an aperture fixed over the detector window

- NPL can check using both our windowless and windowed counters.
- This will also identify any (gross) energy and angular distribution variations.

- Contact laboratories to see if they will participate
- Write the procedure and circulate for comment
- Get the equipment together
- Confirm temperature, battery voltage and long-term stability

- A report to the IRMF detailing what we found and making recommendations that should help to reduce the spread.
- Possibly a note in the open literature talking about the uncertainties observed in lab measurements pointing out how it will only be (much) worse for on-plant work.