

**VALIDATION  
TRACEABILITY  
MEASUREMENT UNCERTAINTY  
CHALLENGES FOR THE 21<sup>ST</sup> CENTURY'S ANALYSTS**

---

Workshop group 2.3:  
**How do laboratories document traceability?**

Convener: Steve Ellison  
Rapporteur: ...



**Workshop group 2.3 – participants:**

- Kreimeyer, Maria (D)
- Novikov, Volodymyr (UA)
- Pawlak, Renata (PL)
- Patriarca, Marina (I)
- Pires do Rego, Eliane Cristina (BR)
- Szymanska, Katarzyna (PL)
- Wacker, Ulrich (D)
- Wiesmüller, Thomas (D)
- Wilke, Olaf (D)

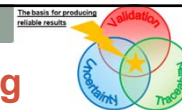
## WG 2.3 questions

- What are the common ways of establishing traceability in the analytical laboratory?
- Will the laboratory distinguish between “Metrological traceability” and “Analytical traceability”?
- Are there problems in identifying calibrations needed to establish traceability?
- Are these calibration procedures and the standards required set out in a SOP?
- What are the difficulties in getting the appropriate standards
- Is further guidance needed in addition to that in the EURACHEM/CITAC Guide: “Traceability in Chemical Measurement and Meeting the traceability requirements of ISO 17025: An analyst's guide“ ??  
If so on what topics?
- How should traceability of empirical measurements be defined and shown?
- Does your laboratory ever document traceability based on participation in PT schemes?




## a) What are the common ways of establishing traceability in the analytical laboratory?

- Certified Reference materials
  - including 'complete' items (test pieces etc)
- Self-made reference materials
  - often based on CRMs (eg dilutions)
- Calibrated devices (thermometers, balances, ...)
- Uncalibrated devices (watches etc)
- Non-certified pure materials
- Manufacturer's standards
  - Sometimes accredited
- Ambient conditions
  - Often need close control of temperature, pressure, humidity etc
  - do we need calibrated monitoring equipment?
    - Often overlooked in laboratories



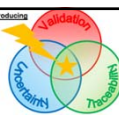
The basis for producing reliable results



**b) Will the laboratory distinguish between “SI traceability” and “Analytical traceability”?**

- Example; dosimetry, measuring 'darkness' on a grey scale
- Example: pH. Certificates come with pH standards 'traceable to NIST'.
  - which means ... ?
  - ... checking the NIST policy could be useful ...
- Pure substances
  - lack of SI traceability
  - Do pure materials provide SI traceability?
    - and does accreditation improve it?
    - needed for long term trends?
- Pure materials are a bit contentious

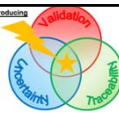
The basis for producing reliable results



**c) Are there problems in identifying calibrations needed to establish traceability?**

- Sometimes environmental conditions are ignored
- Noted that calibration is not always necessary to show sufficient control

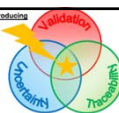
The basis for producing reliable results



**d) Are these calibration procedures and the standards required set out in a SOP?**


- Yes
- .... of course!!

The basis for producing reliable results



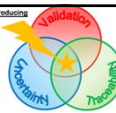
**e) What are the difficulties in getting the appropriate standards**

- Availability varies
- Reliability can also vary (depending on how matrix CRMs are certified)



**f) Is further guidance needed in addition to that in the EURACHEM/CITAC Guide: “Traceability in Chemical Measurement and Meeting the traceability requirements of ISO 17025: An analyst's guide“ ?? If so on what topics?**

- Pure materials
- Environmental conditions
- Complex equipment
- Calibration frequency



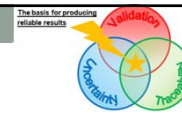
**g) How should traceability of empirical measurements be defined and shown?**

- [See presentation by Alex Williams]




## h) Does your laboratory ever document traceability based on participation in PT schemes?

- Q: How can one get traceability from a PT?
- Need to distinguish comparison (no need for traceability) with measurement of a certified material used in a PT (same as a CRM)
- Use of a PT material for calibration makes the calibration traceable to the PT value.
- Discussed whether 'check' materials confer traceability
  - Balance of opinion was 'no'...
  - Implication; they aren't part of the uncertainty either
    - ... or are they?



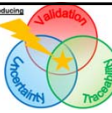
## Additional subjects discussed

- What do we do with sophisticated equipment dependent on the manufacturer?
- How often should we calibrate?
- Types of calibration
  - Official (eg States in Germany – state institutes not always accredited)
  - Any others
  - Sometimes involves paying twice...



## Documenting traceability

- Documentation is very important
  - Certificates, log books etc
  - Numbering system to identify individual items
    - (allows tracing back to original item)
  - Procedures for calibration, including calibration frequency
  - Certificates don;t always show accreditation status
    - don't know whether the certification is valid
- 'Internal calibration' also needs qualified staff ...
  - May need separate accreditation for calibration



## Metrological traceability

- Question: is training part of metrological traceability?
  - Some discussion...
    - training is part of establishing traceability
    - .. but this is separate from the 'technical part' of metrological traceability
- There are different views of the 'scope' of traceability
  - everything necessary to ensure reliable results vs just the activity concerned with calibration
- Also still some need to be careful using metrological as opposed to any other traceability
- Traceability chain can be defined on a technical basis; other issues can be dealt with by management system and uncertainty
  - Comment: 'breaks' – such as matrix effects – can be 'fixed' by incorporation in uncertainty
  - not unanimous ...
- ... and "What is a calibration"? ...