



**Workshop on Understanding and Evaluating Radioanalytical  
Measurement Uncertainty**

*5 - 16 November 2007*

**Stability of the Analytical System - Part I**

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# Understanding and Evaluating Radioanalytical Measurement Uncertainty

## Stability of the analytical system

Part 1- Analytical Method Documentation

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8–16 November 2007 ICTP, Trieste, Italy

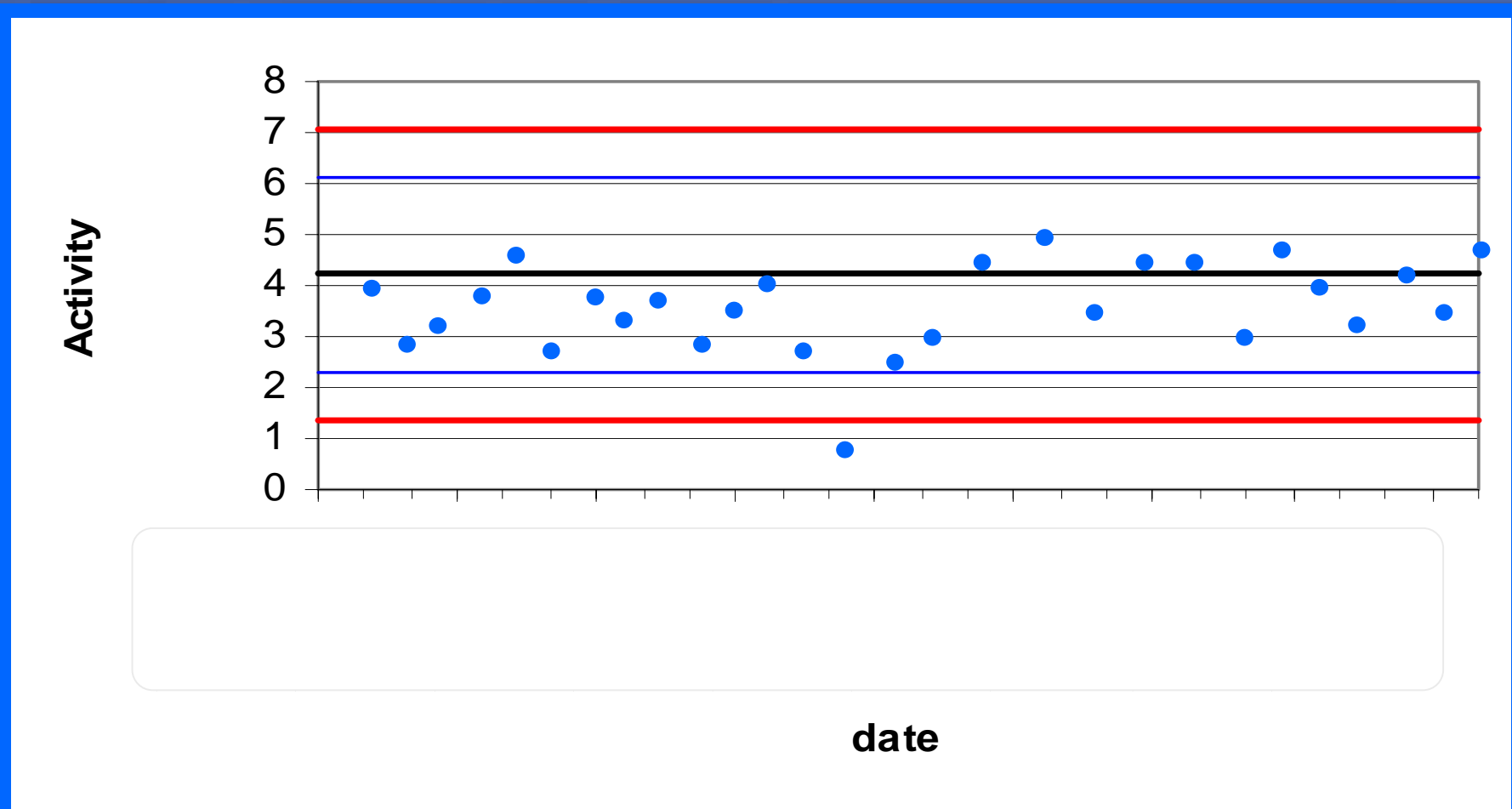


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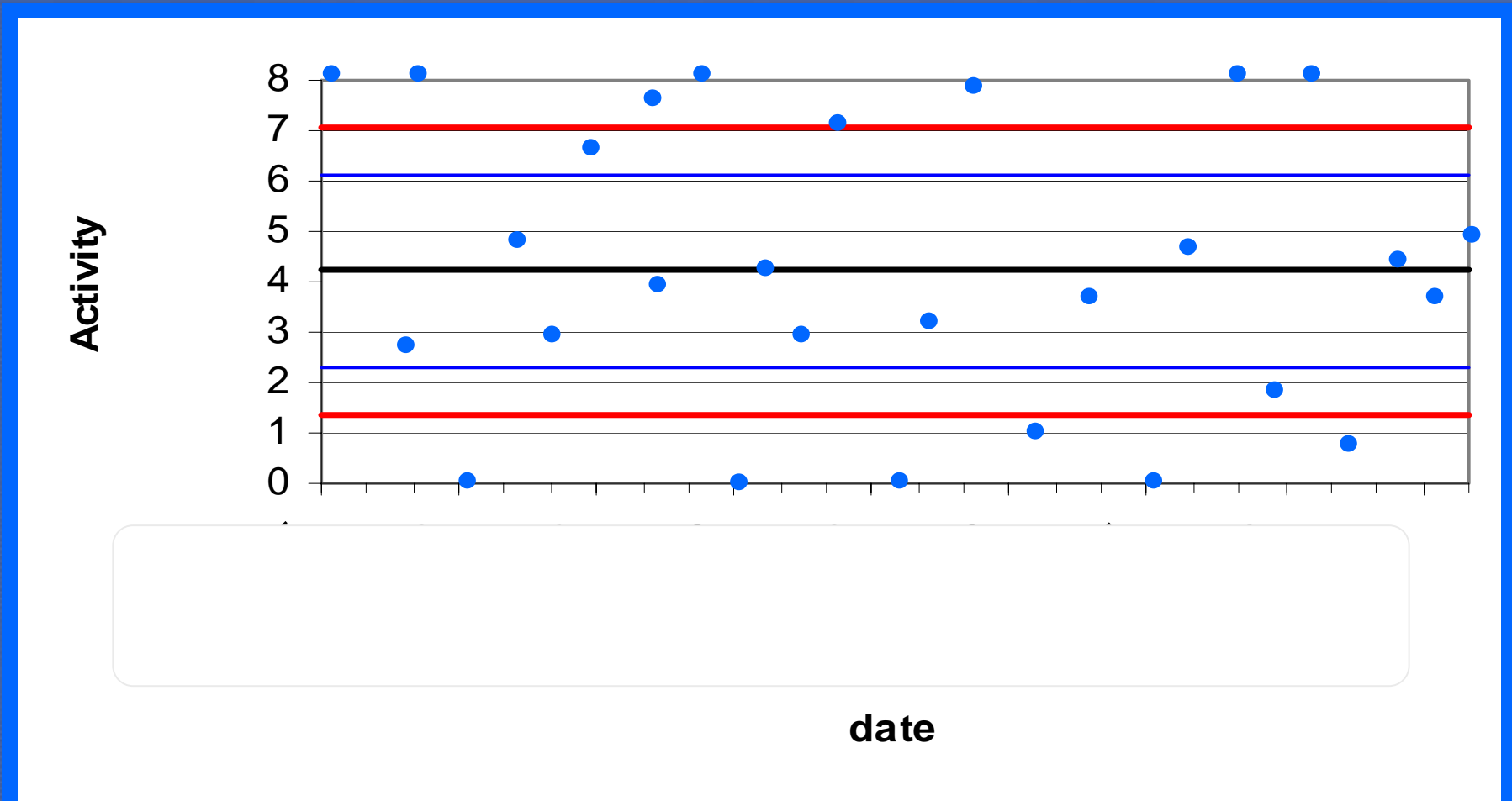
## Outline

- The importance of analytical system stability in uncertainty estimation,
- Tools for establishing, monitoring and keeping the analytical system stability,
- Quality control and method validation,
- Exercises on statistical tools used for quality control and method evaluation,

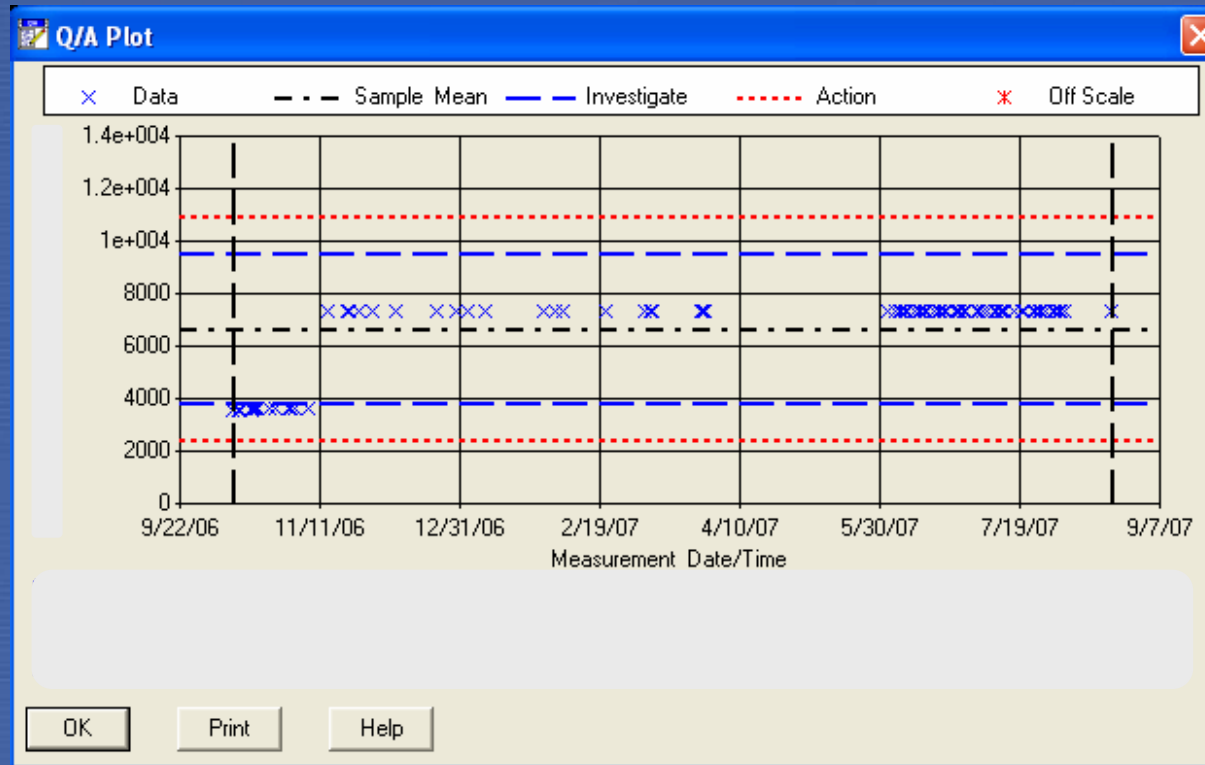
# What is analytical system stability?



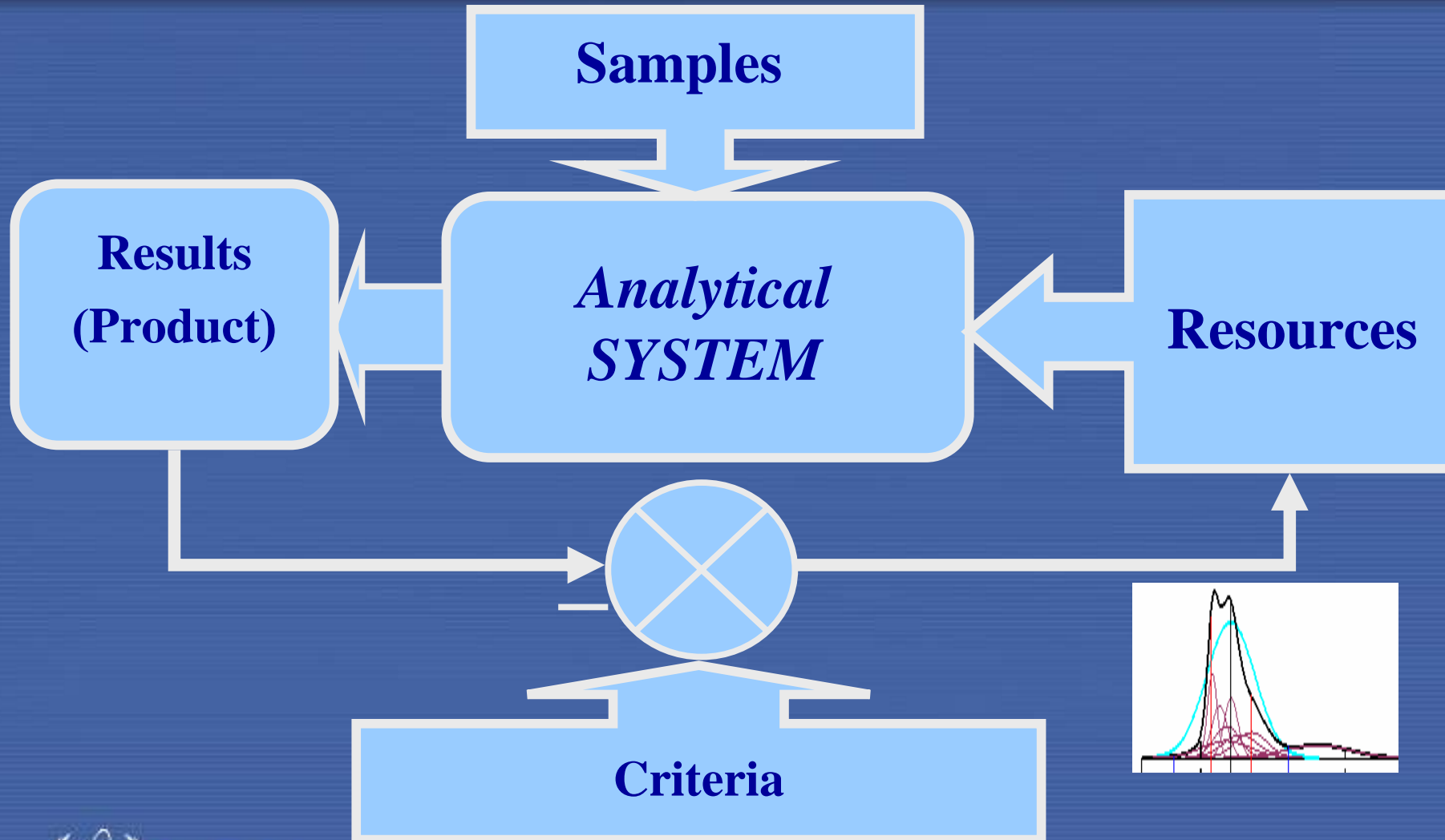
# What is analytical system stability?



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# What for analytical system stability?



## What for analytical system stability?

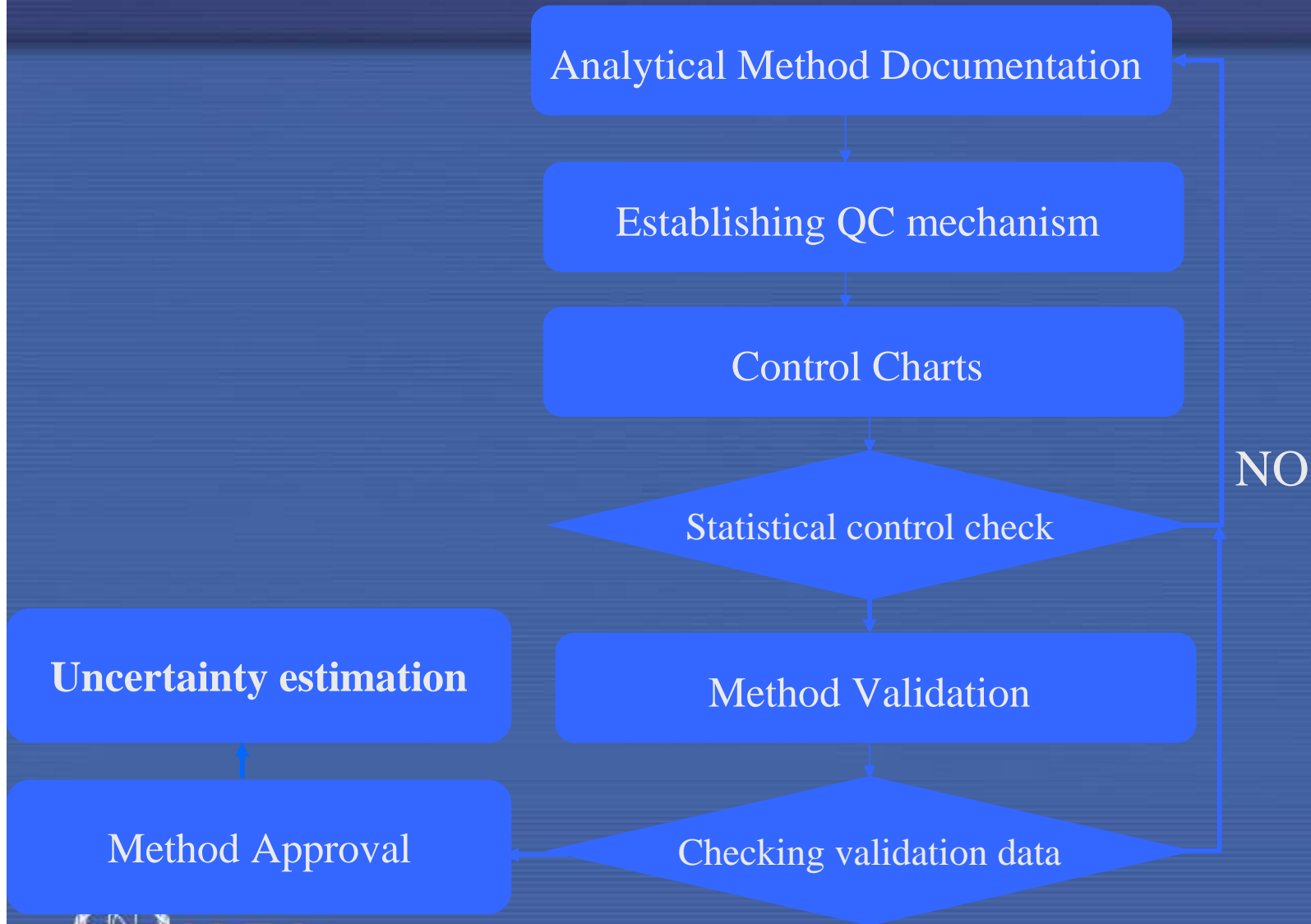
Assuring, maintaining and monitoring analytical system stability.

- To claim the uncertainty statement as long as the system is stable,
- To assure that the estimated uncertainty is still valid,
- To decide when to verify the validity of the uncertainty statement





# Analytical system stability



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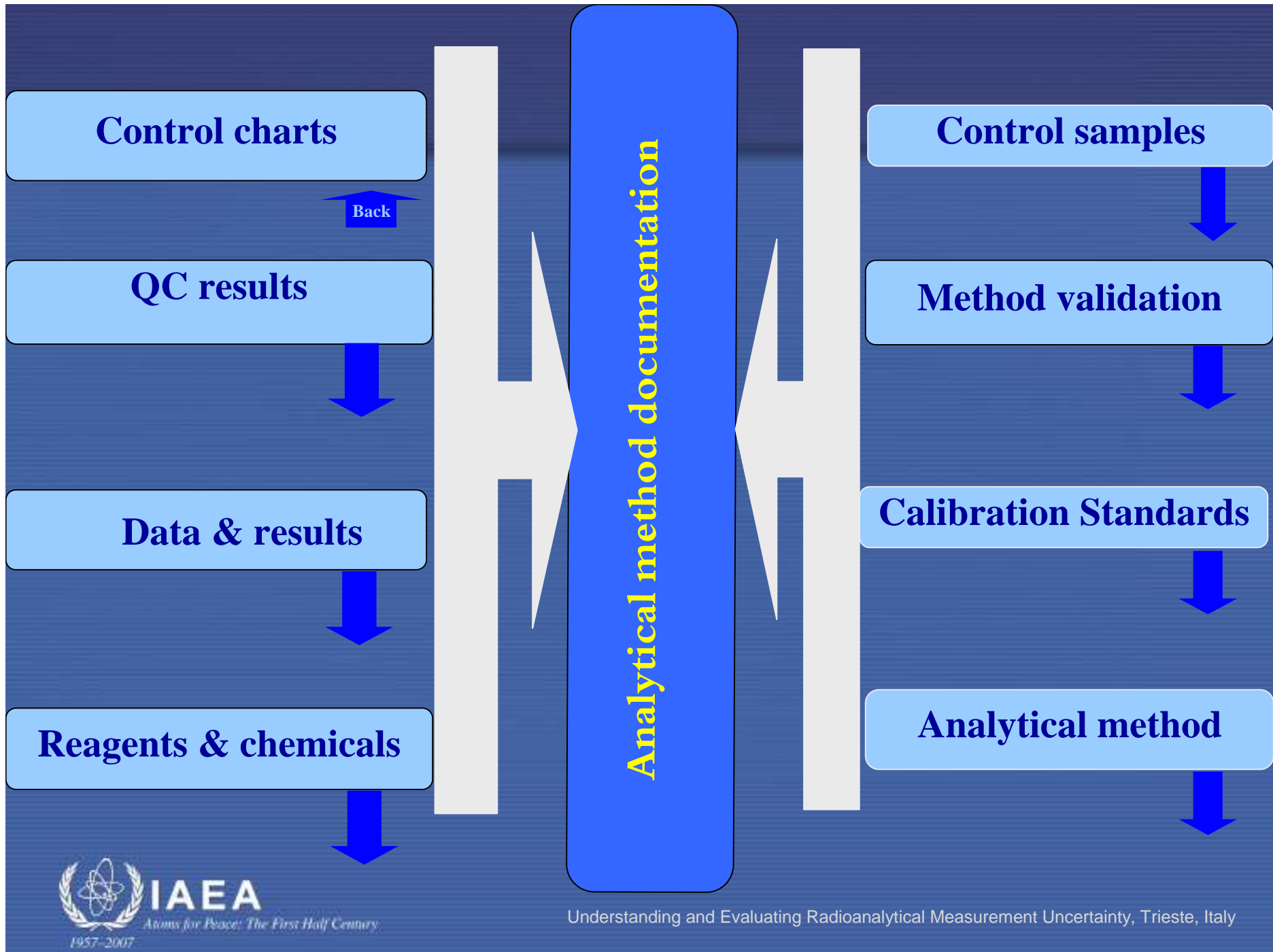
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# Analytical method documentation

## Why?

- Tacking the root cause of an analytical problem,
- To define the measurand, matrix, limitations, scope....
- To emphasise the “system” rather than “individual” approach,
- To ensure the stability of the analytical system,



## Analytical method documentation

### Main parts of the analytical method:

- Scope of the method
- Instrumentation
- Reagents
- Calibration method
- Interferences and corrections
- Measurement procedure
- Calculations and results reporting
- Quality control mechanism, will be discussed later,
- Recording
- References
- Method developments

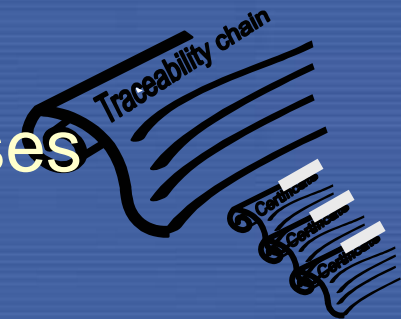


# Analytical method documentation

## Calibration standards and CRM record:

### Traceability requirement

- Description of the calibration standard,
- Method for checking standard integrity,
- Regular usage data: amount taken, masses
- Carriers, solvent used, preservative,



# Analytical method documentation

Method validation record:

## Method performance indicators

- Method minimum detection limits per analyte/matrix,
- Method repeatability per analyte/matrix
- Method reproducibility per analyte/matrix.



# Analytical method documentation

Control samples:

## Statistical control tools

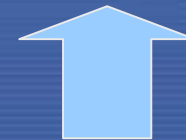
- In-house control samples for precision control,
- CRM for trueness control
- Point sources for resolution control.



# Analytical method documentation

## Reagents & chemical:

- Preparation method, used chemicals, manufacturer, lot, quantities,
- Preparation date, analyst, validity period.





## Analytical method documentation

### Analytical results and data:

- Analyst, date of analysis, sample #,
- Sample preparation method,
- All technical parameters
- Raw readings, spectra.

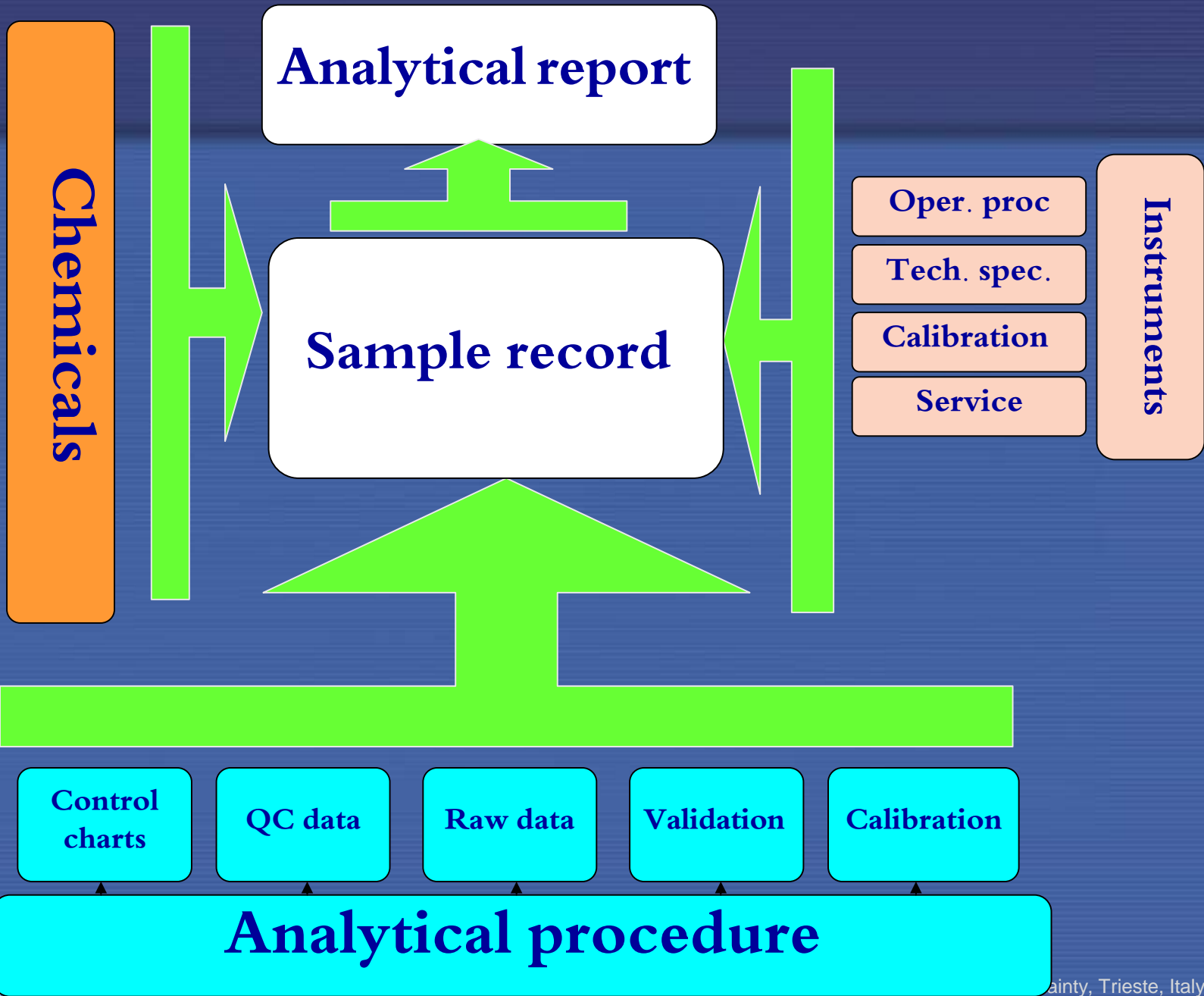


# Analytical method documentation

## Quality control data:

- Control samples results,
- Daily checks results,





Many  
thanks



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