Updates on WELMEC WG7- Software

April 2025

WELMEC WG7

- WELMEC is a European Co-ordinating Group for European Legal Metrology
- Has a series of working groups that discuss legal metrology issues that face market surveillance
- The WELMEC 7 series of Guides cover the approval and certification of software
- Have recently been reviewed to make them more technology independent

The Status Quo

- The present Guide 7.2 is based in defining dedicated physical components and clearly identifiable software modules.
- Attempt to control this with category 1 and category 2 components.
- Enables the possibility of separate sealing.
- Review of the Guides to improve on this positions.
- The old guides can be seen as technically prescriptive

The Status Quo

- Need for the Guides to cover “new” technologies like cloud-based systems running on general purpose software.
- The revised guides will allow a manufacturer to use any solution that meets the essential requirements.
- If they do not use their own solution manufacturers can use the pre-defined acceptable solutions.
- Will define assets- anything that must be protected for the purposes of the Directives / Regulations
- Will define instances of the assets- storage, transmission, processing
- Types of inadmissible influence (vectors) that may affect authenticity, integrity and availability

WELMEC WG7

WELMEC 7.1

Informative document: Asset based Software Requirements

WELMEC 7.2

Software Guide

WELMEC 7.3

Acceptable solutions

WELEMC 7.4

Examples of Software Evaluation

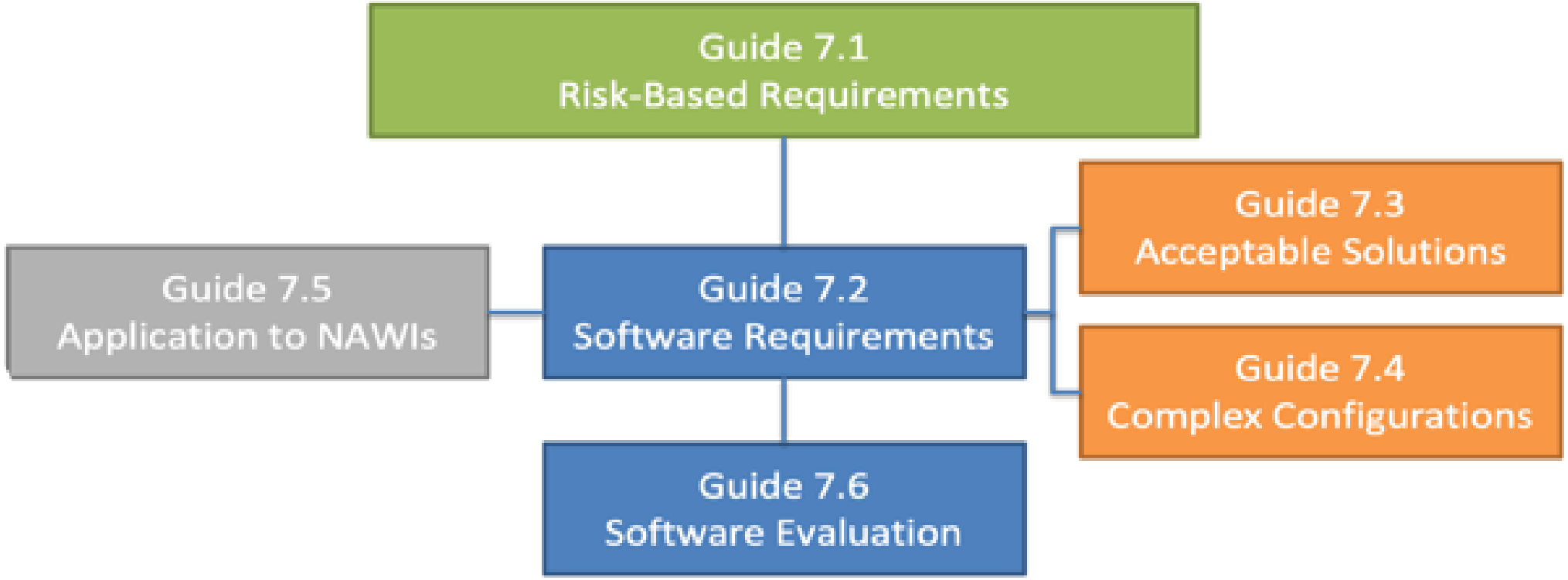
WELMEC 7.5

Software in NAWI's

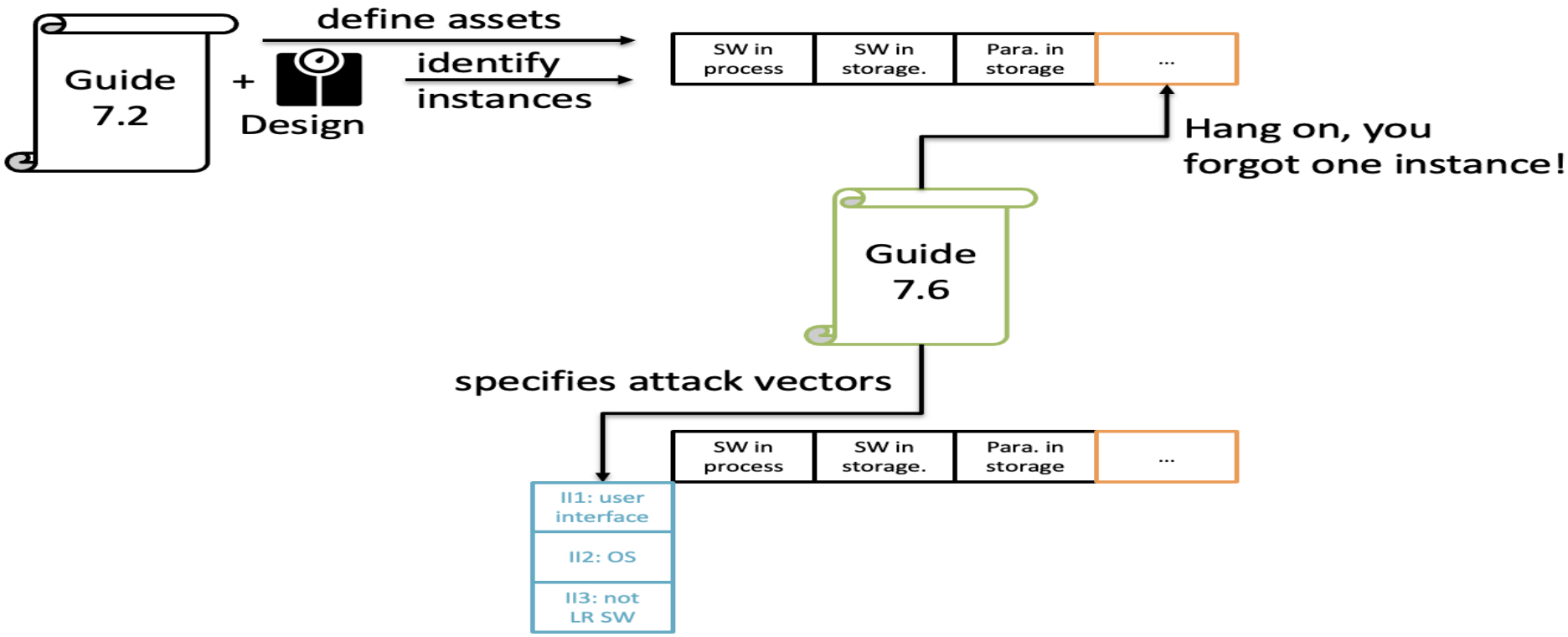
WELMEC 7.6

Software Evaluation

Relationship between the Guides



Relationship between the Guides



Guide 7.1- Asset based software requirements

- Introduces the notion of assets and then goes on to decide how those assets will be controlled
- An asset is any data, service or other component that supports information related activities.
- For the purposes of the Guide an asset is an entity that must fulfil the essential requirements and or has an impact on the compliance.
- If an essential requirement addresses an asset , that asset must be controlled
- It may be possible to control assets rather than the entire operating system.
- Seems a circular definition.

Guide 7.1- Asset based software requirements

Example:

- There are several essential requirements that address measurement results – allowable errors, reproducibility, repeatability, discrimination and sensitivity, durability
- From this the measurement result becomes an asset that must be protected
- Table 2 gives a list of assets- software identification-parameters-measurement data-measurement result-inscriptions and indications .
- Seems to be a different way of reaching the same goal

Guide 7.1-Requirements for assets

- Assets need to be adequately secured and protected to ensure *Integrity authenticity and availability*
- Assets can exist in range instances at any time and place

  e.g. in the case of measurement data it will be during processing, transmission and storage
- This should hopefully make this technology independent.
- The Guide still includes the risk classes we saw in the old Guide 7.2
- Most weighing instruments will come out as risk class C
- Annex II is important – lists the essential requirements and derived assets

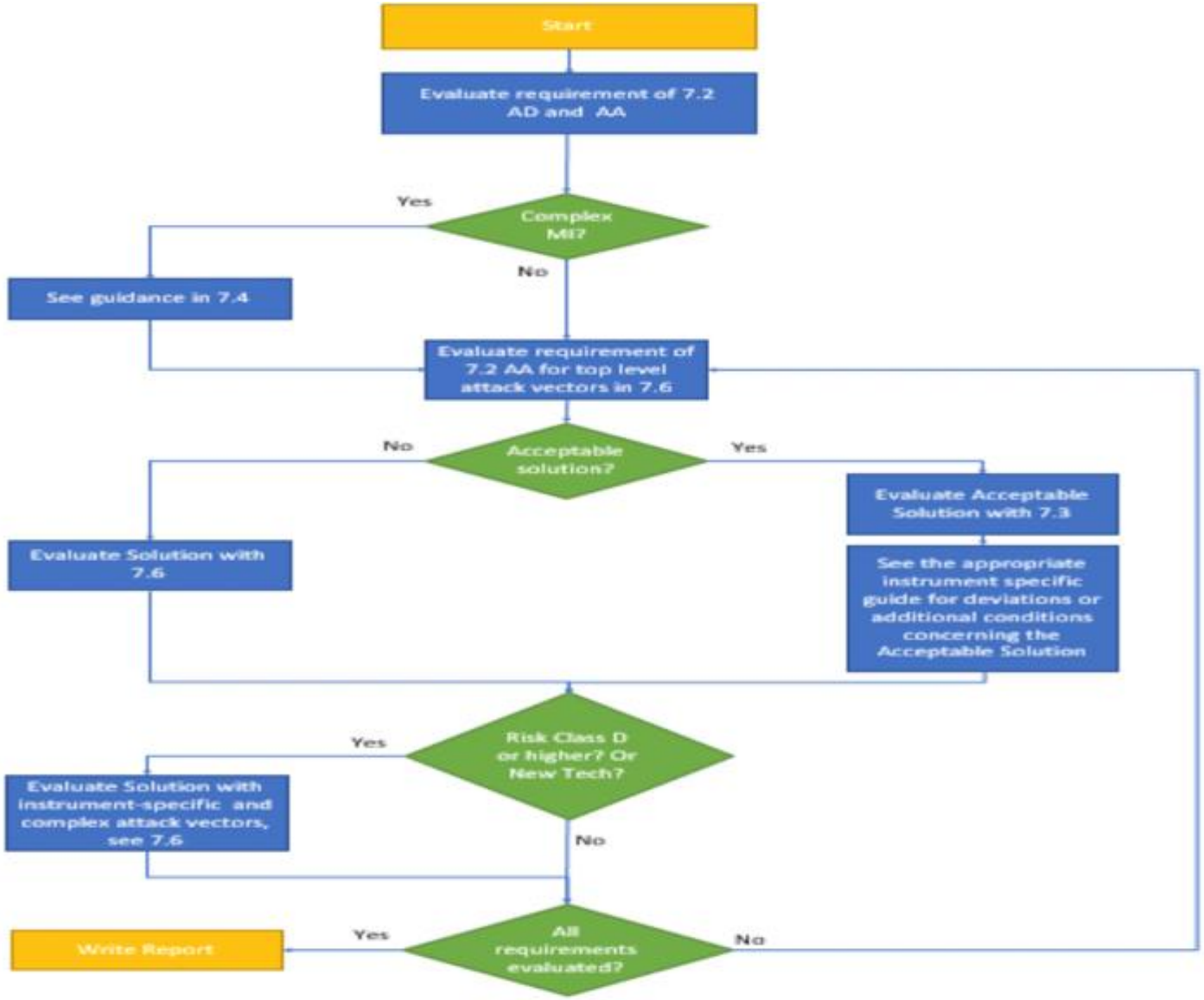
Guide7.2 –Software Guide

- This is now much shorter than the previous guide (25 pages rather than 148)
- Defines that an asset needs to be *adequately secured and protected* to ensure the *integrity, authenticity and availability.*
- To achieve this the manufacturer can either use their own solutions which are evaluated against Guide 7.6

OR

- Use solutions in Guide 7.3 (Guide 7.4 provides additional guidance for the evaluator to check the adequacy of solutions)

Workflow



Workflow-explanation

- Evaluate requirements of 7.2 AD and AA
- AD are the requirements for documentation
- AA relates to the availability, integrity and authenticity of assets
- They are formatted in a similar way to the blocks in the old Guide 7.2 but are much more generic
- The annex 1 checklist has been re-formatted to cover the requirements of the Guide and is very good

Guides 7.3 and 7.4

- These exist as possible technical solutions if a manufacturer wants to make use of them
- The Guide 7.3 provides multiple acceptable solutions (AS) which aim to implement adequate security and protection for assets
- The AS can be used for any assets
- It has the same format as the blocks of the old guide with each block having a specific solution
- There are AS for securing and protection against changes and inadmissible influences (AA1)
- There are AS for providing evidence of operation (AA2 and AA3)

Guides 7.3 and 7.4

- WELMEC 7.4 gives us some examples of reference architectures and how they should be evaluated
- The Guide starts with a complete measuring instrument with no communication interfaces as a base line and summarizes the steps that need to be taken by the evaluator and the manufacturer with the help of tables
- Additional design functionality is then added in the various examples

WELMEC 7.6 –Software evaluation

- This is an important guide and helps understand the processes involved in the evaluation
- Based on the notion of attack vectors and evaluation of their risk
- Should consider the generic vectors in 3.3 and outlines the functional checks that need to be executed
- Also instrument specific vectors
- Then a procedure for quantifying the risk (4.1)
- Importantly does include an attacker motivation score (6.2)

Conclusion

- There has been a vast amount of work to get to this point
- It marks a fundamental and positive shift in the way the that software will be evaluated
- Move towards assets rather than hardware is a recognition that weighing technology has progressed and we must begin to manage this
- This structure will begin to recognise cloud technologies connected systems
- Can be seen to be quite academic and convoluted
- Difficult to follow (6 Guides !)
- Likely that it will have little material effect on weighing instruments