



Automotive SPICE® 4.0 and the new intacs® training concept

Bernhard Sechser / 18 July 2024

Agenda

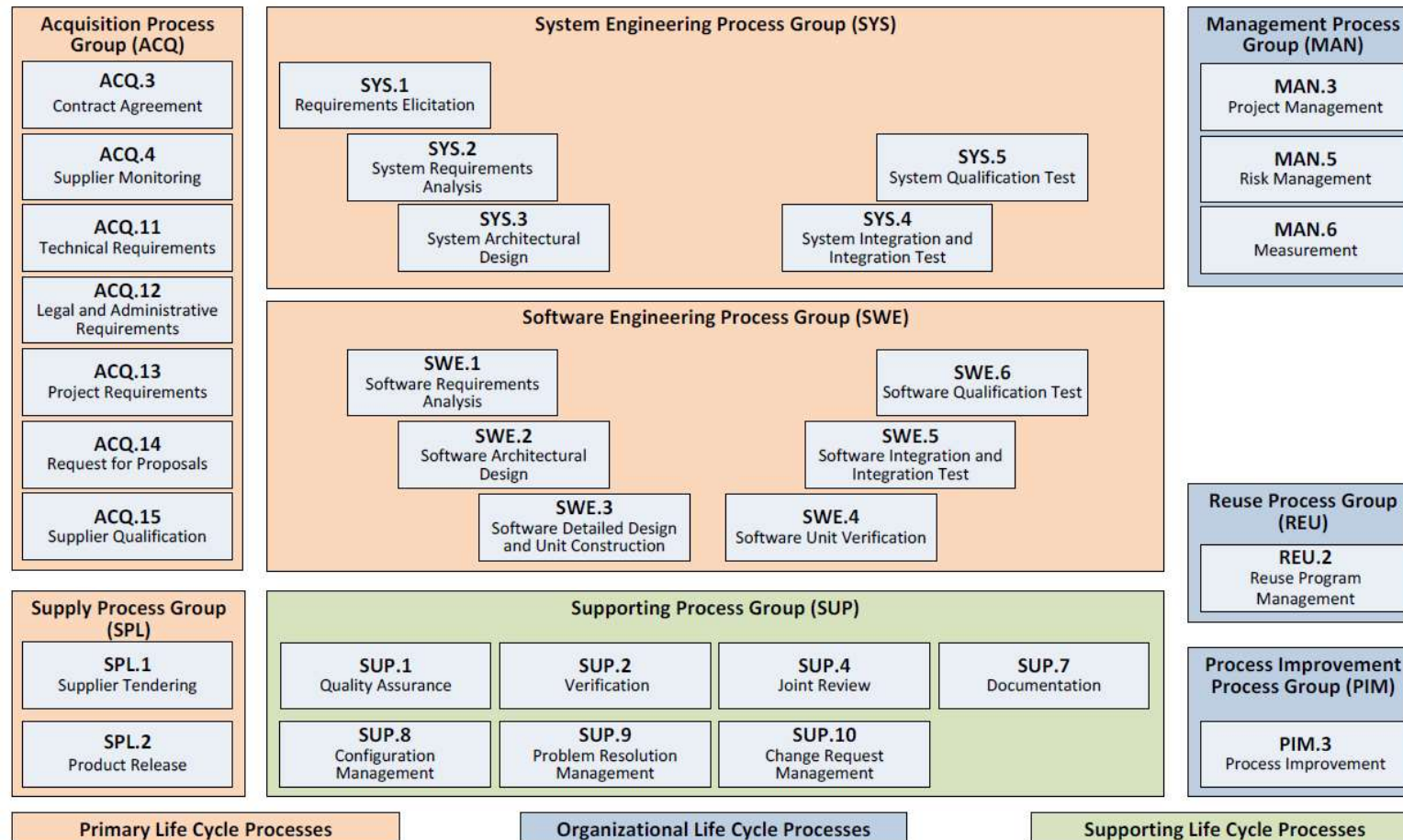


- The Idea of the “3-Levels-Qualification”
- Training Architecture and Certification Rules
- Observations and Observers
- intacs® Roadmap

The Idea of the “3-Levels-Qualification”

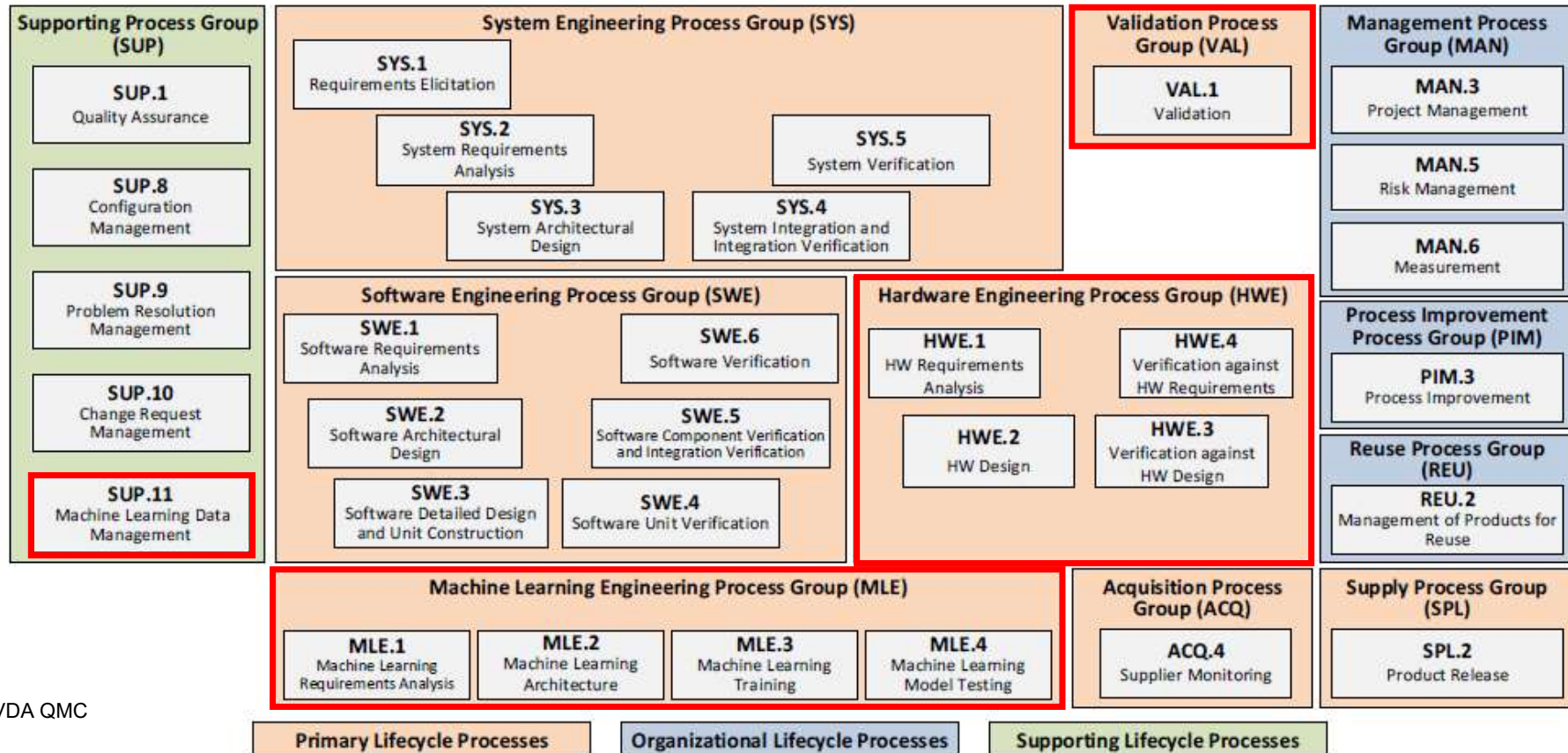


The Idea of the “3-Levels-Qualification” Automotive SPICE® v3.1



Source: VDA QMC

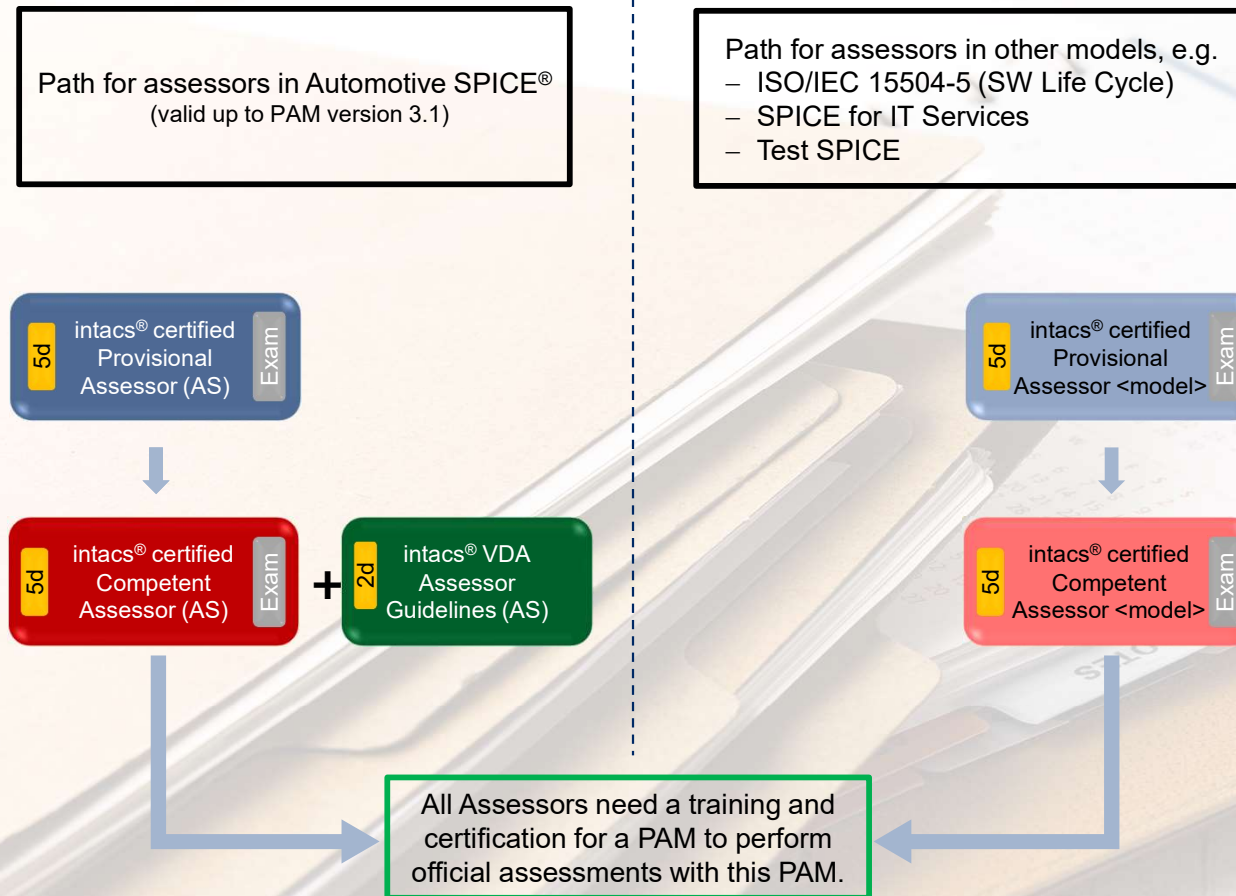
The Idea of the “3-Levels-Qualification” Automotive SPICE® v4.0



Source: VDA QMC

Plus: Conceptual changes on all indicators of CL 1,2,3 of the measurement framework

The Idea of the “3-Levels-Qualification” Current intacs® Training Architecture

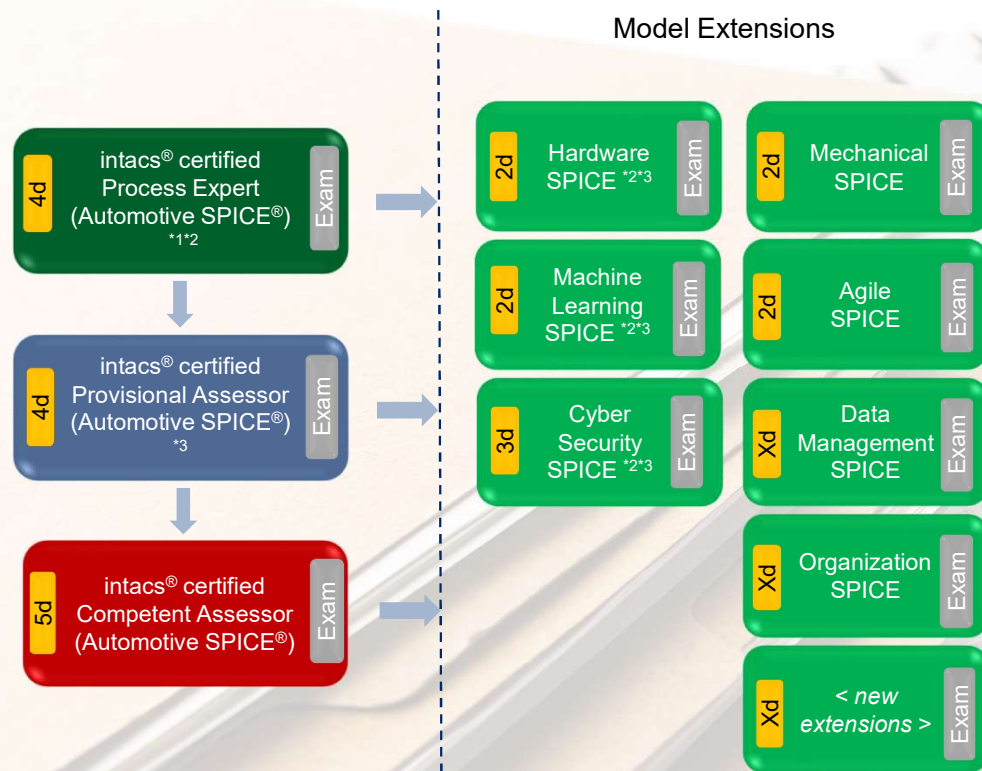


The Idea of the “3-Levels-Qualification” Challenges



- Development and Maintenance of assessor training material for each PAM individually
- Model Changes must be integrated in all trainings
- Existing PAM Guidelines are trained separately
- Extension of PAM process groups cannot be integrated anymore in a one-week-training
- No systematic integration of PAM Extensions trainings
- Only assessors are addressed by the intacs® trainings

The Idea of the “3-Levels-Qualification” New training structure



*1 includes Base / System / Software processes without HWE and MLE, emphasizes Process Improvement

*2 includes all Guideline aspects regarding content

*3 includes all Guideline aspects regarding rating rules

The Idea of the “3-Levels-Qualification” intacs® Certified Process Expert



intacs® certified
Process Expert
(Automotive SPICE®)

Objectives:

- **Detailed model knowledge** of the Automotive SPICE® v4.0 PAM
 - Interpretation of the VDA Automotive SPICE® **Guidelines** v2.0 **regarding content**
 - Support the **process improvement** in the organization and the proper preparation of the people (not only for assessments)
- Process Experts shall play an important role for the organization/project in **Process Improvement** (SPICE) in the same way as assessors play an important role in **Capability Determination** (SPICE) during an assessment.

The Idea of the “3-Levels-Qualification” intacs® Certified Provisional Assessor



intacs® certified
Provisional Assessor
(Automotive SPICE®)

Objectives:

- **Deepening of model knowledge** of the Automotive SPICE® v4.0 PAM
 - Interpretation of the VDA Automotive SPICE® **Guidelines** v2.0 **regarding rating rules**
 - **Internal evaluation** of projects from the organization
 - Contribution in **official assessments** as a Co-Assessor
- Entry point for becoming an **Automotive SPICE® assessor**, by carrying out internal evaluations independently and assisting with official assessments.

The Idea of the “3-Levels-Qualification” intacs® Certified Competent Assessor



intacs® certified
Competent Assessor
(Automotive SPICE®)

Objectives:

- **Advanced assessor skills** and understanding of Automotive SPICE® v4.0 PAM
- Application of the VDA Automotive SPICE® **Guideline v2.0 in all situations**
- **Acting as a Lead Assessor** in intacs® and VDA accepted official assessments.

➤ Becoming an experienced and responsible **Lead Assessor** for Automotive SPICE®, that understands and guides less experienced people.

The Idea of the “3-Levels-Qualification” ... plus additional skills – Hardware Extension



Hardware SPICE

HWE.1 Hardware
Requirement Analysis

HWE.4 Verification against
Hardware Requirements

HWE.2 Hardware Design

HWE.3 Verification against
Hardware Design

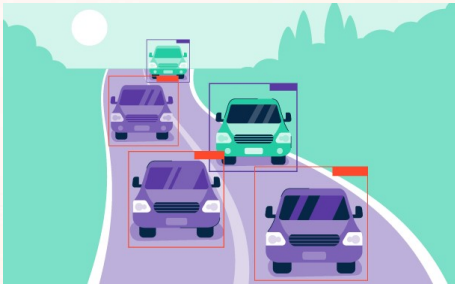
- HWE.1 is similar to SYS.2 / SWE.1
- HWE.2 includes „Hardware Architecture“ and „Hardware Detailed Design“
- HWE.3 and HWE.4 are similar to other verification processes like SYS.4 or SYS.5

The Idea of the “3-Levels-Qualification” ... plus additional skills – Machine Learning Extension

**Example:
recognition of cars**

**Problem or
Requirement**

Video data of cars

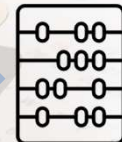


[Source:

<https://www.superannotate.com/blog/object-detection-with-deep-learning>

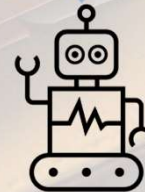


Data

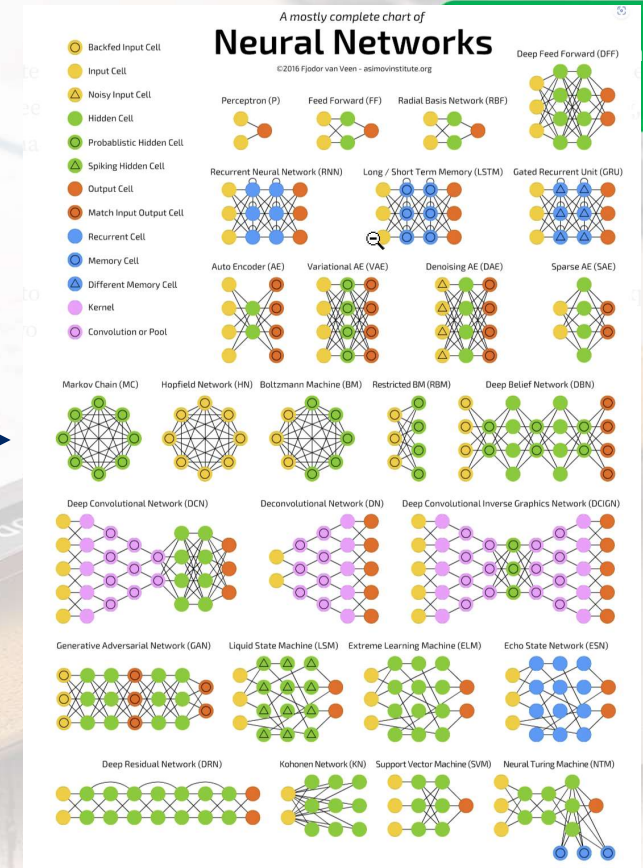


Model

Training

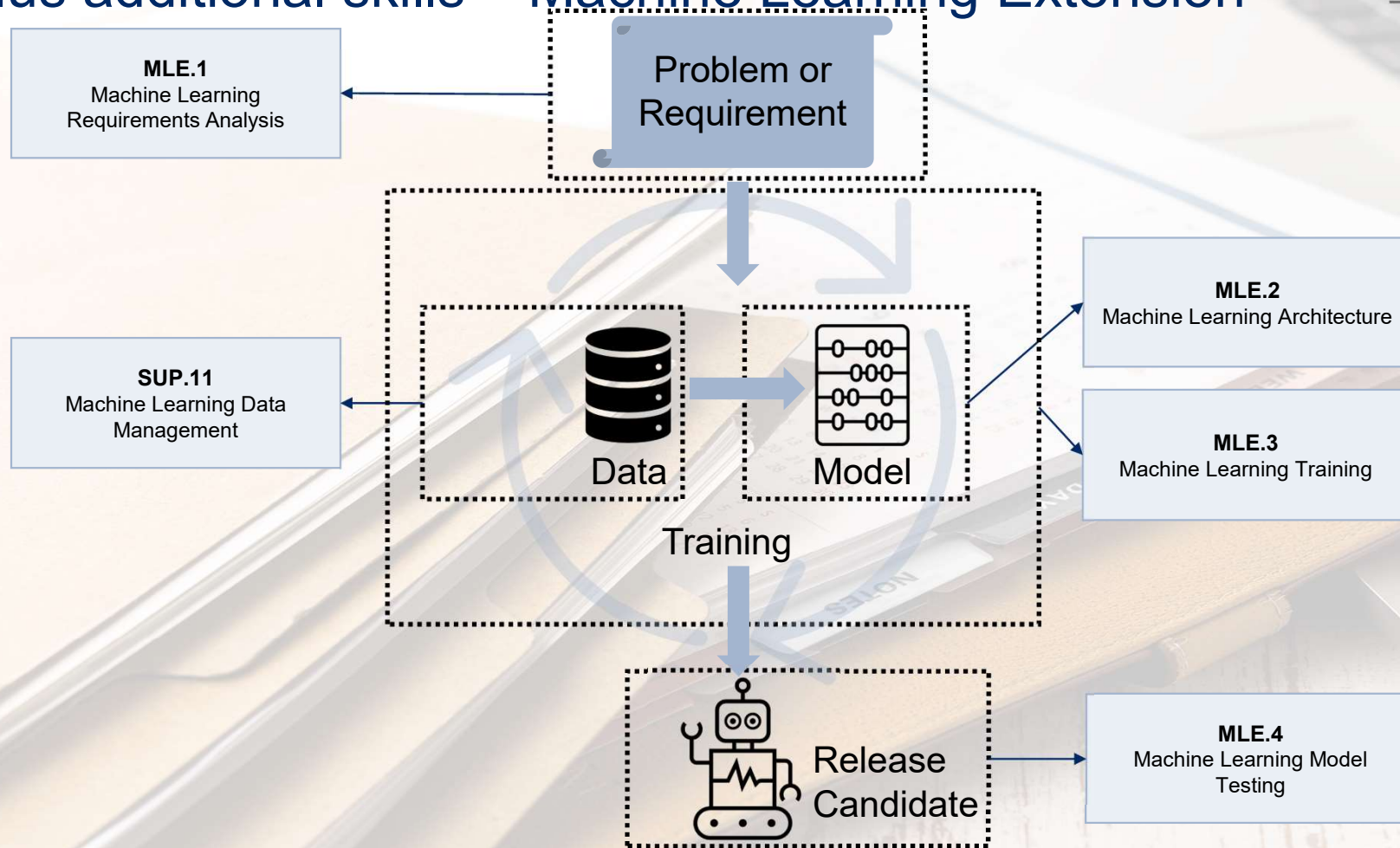


**Release
Candidate**



[Source: asimovinstitute.org]

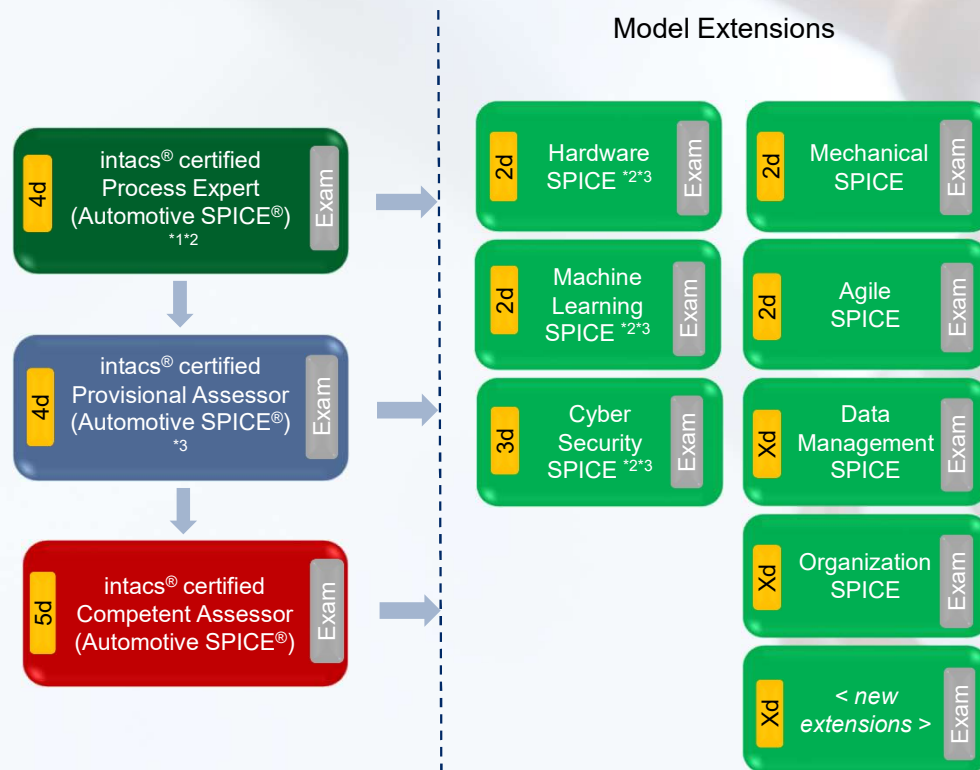
The Idea of the “3-Levels-Qualification” ... plus additional skills – Machine Learning Extension



Training Architecture and Certification Rules



Training Architecture and Certification Rules – New training structure



*1 includes Base / System / Software processes without HWE and MLE, emphasizes Process Improvement

*2 includes all Guideline aspects regarding content

*3 includes all Guideline aspects regarding rating rules

*4 Core PAM for Automotive SPICE® 4.0 contains Base / System / Software processes (and not model extensions for Hardware Engineering and Machine Learning)

All Assessors need an assessor certification for a **Core PAM***4 to perform official assessments with this PAM.

At least **one Assessor of the assessment team** needs a certification for a **model extension** to perform official assessments with this extension.

Training Architecture and Certification Rules – Challenges and Change Requests



Challenges to become Competent Assessor:

- Assessor candidates must attend 3 trainings instead of 2
- Overall training duration is now 13 days instead of 12
- 3 exams must be passed instead of 2

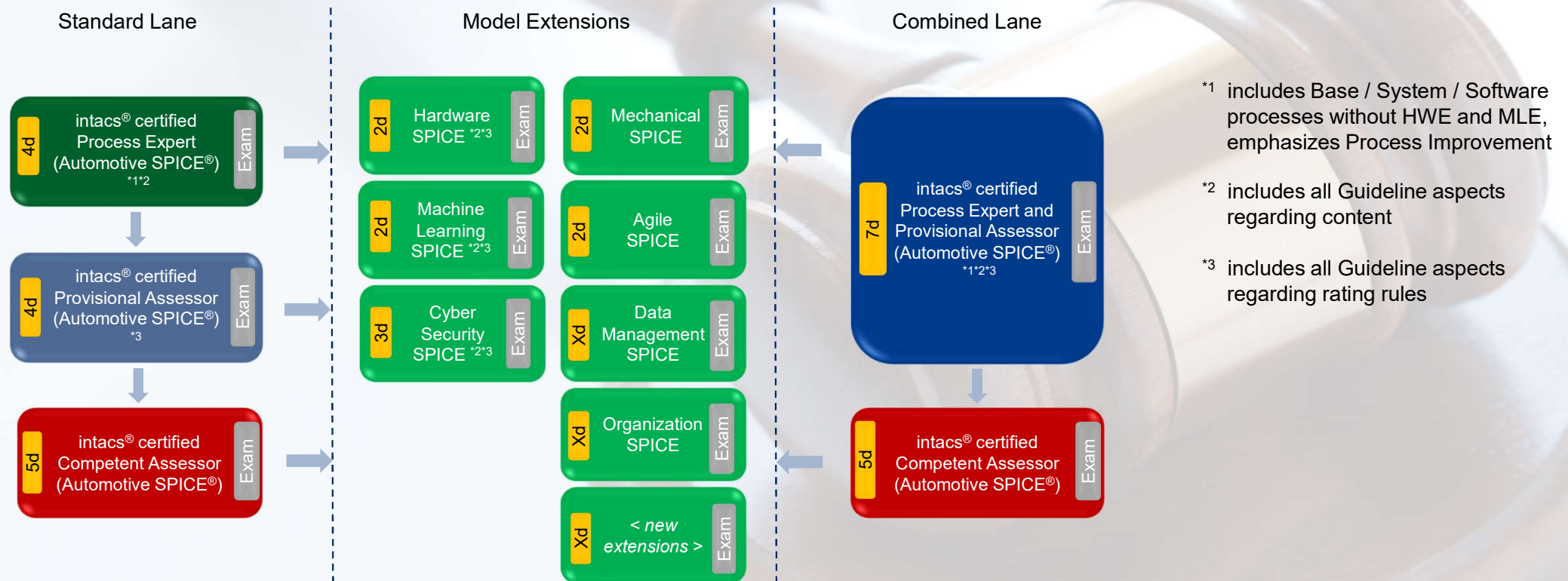
Change Request from Stakeholders:

- Allow to become Competent Assessor with no more effort than before

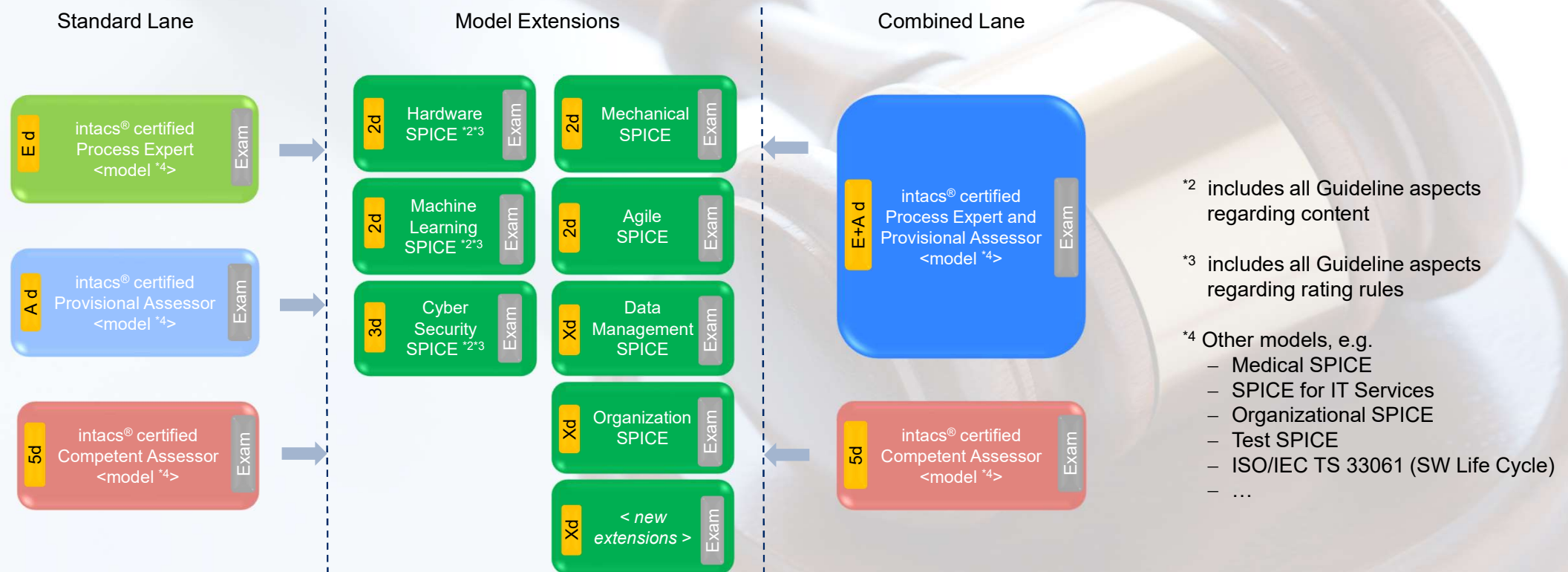
Solution:

- Alternative training path with 2 trainings, 12 days duration, 2 exams only → Combined Lane

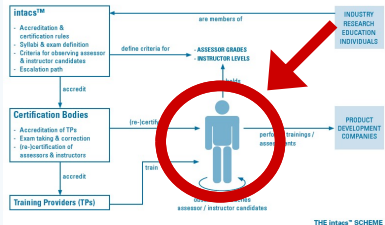
Training Architecture and Certification Rules – valid as of October 1st, 2024



Training Architecture and Certification Rules – valid as of October 1st, 2024



Training Architecture and Certification Rules



- Proven teaching skills
- Approval by an accredited instructor (observation process)
- No training course or exam



“intacs® certified Instructor Competent Level“
(qualified for all passed
Process Expert PAMs and Extensions;
domain specific qualifications may apply*)



“intacs® certified Instructor Provisional Level“
(qualified for all passed
Process Expert PAMs and Extensions;
domain specific qualifications may apply*)



“intacs® certified Principal Assessor“
(qualified for all passed
Process Expert PAMs and Extensions;
domain specific qualifications may apply*)



“intacs® certified Competent Assessor“
(qualified for all passed
Process Expert PAMs and Extensions;
domain specific qualifications may apply*)



“intacs® certified Provisional Assessor“
(qualified for all passed Process Expert PAMs;
domain specific qualifications may apply*)



“intacs® certified Process Expert“
(Automotive SPICE®, Test SPICE, Medical SPICE,
SPICE for IT Services, ...)

- Continuously and actively contributes to the international SPICE community's knowledge & best practices
- No training course or exam
- Active assessment experience
- Passed training course & exam
- Capable of leading assessments
- Passive assessment experience
- Passed training course & exam
- Capable of acting as a co-assessor
- Little or no assessment experience
- Passed training course & exam
- Capable of supporting internal improvement activities

* e.g. VDA-specific requirements for qualification

Training Architecture and Certification Rules

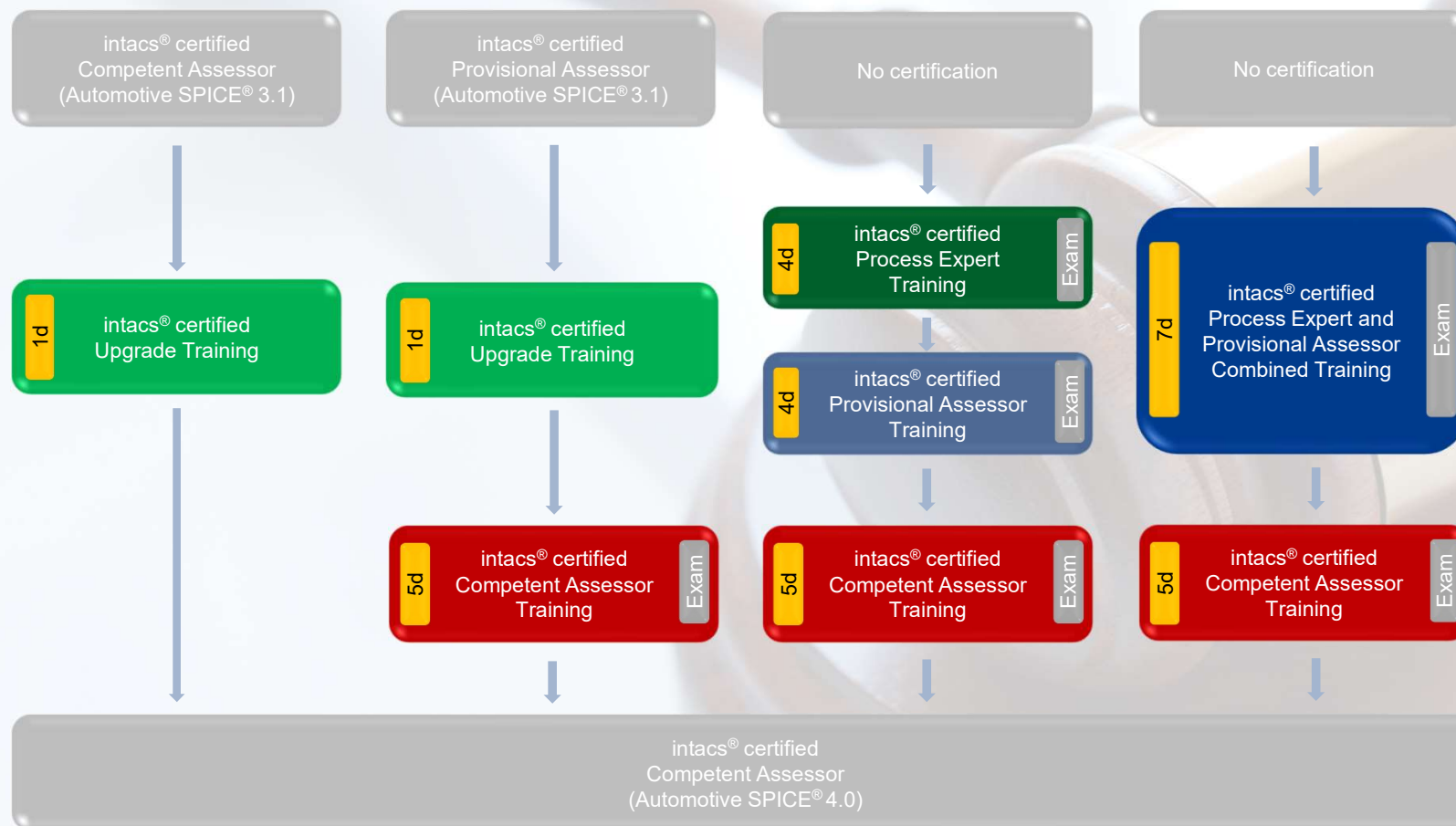


| PROCESS EXPERT | PROVISIONAL ASSESSOR | COMPETENT ASSESSOR | PRINCIPAL ASSESSOR | INSTRUCTOR PROVISIONAL | INSTRUCTOR COMPETENT |
|---|--|--|---|---|--|
| INITIAL CERTIFICATION | | | | | |
| <input type="checkbox"/> Process Expert training completed, and exam passed | <input type="checkbox"/> Certificate Process Expert level <input type="checkbox"/> Provisional Assessor training completed, and exam passed | <input type="checkbox"/> Certificate Provisional level <input type="checkbox"/> Competent Assessor training completed, exam and observation passed <input type="checkbox"/> Upgrade training ASPICE 4.0 attended <input type="checkbox"/> Lead Assessor observation passed <div> <input type="checkbox"/> AT AT AT AT AT </div> <div>within 60 month</div> | <input type="checkbox"/> Certificate Competent level <div> <input type="checkbox"/> AL AL AL AC AC any </div> <div>within 36 month</div> | <input type="checkbox"/> Certificate Principal level <input type="checkbox"/> Didactic skills <input type="checkbox"/> Training observation passed (Provisional course) <div> <input type="checkbox"/> AT,AL AL AL AC AC any </div> <div>within 36 month</div> | <input type="checkbox"/> Certificate Instructor (Provisional) <input type="checkbox"/> Training observation passed (Competent course) |
| LICENSE RENEWAL | | | | | |
| (no requirements) | (no requirements) | <div> <input type="checkbox"/> AT,AL AL AL EP,AC any any </div> <div>within 36 month</div> | <div> <input type="checkbox"/> AT,AL AL AL AC AC any </div> <div>within 36 month</div> | <div> <input type="checkbox"/> AT,AL AL AL AC AC,CT any CT </div> <div>within 36 month</div> | |

| TYPES OF EXPERIENCE EVIDENCE | | | |
|---|---|--|---|
| Assessment participation | Passive event participation (intacs®-accepted, ≥ 6 net hours) | Active contribution (intacs®-accepted, ≥ 6 net hours) | Assessor training course held |
| <div>AT</div> Assessment team member ≥ 50 h (Preparation, Execution, Reporting) | <div>IP</div> Internal event | <div>AC</div> Examples: <ul style="list-style-type: none"> Presentation at an intacs®-accepted event Member of an iNTACS Working Group Publication of a SPICE-related paper | <div>CT</div> <ul style="list-style-type: none"> intacs® Process Expert training intacs® Provisional Assessor training intacs® Competent Assessor training |
| <div>AL</div> Assessment team lead ≥ 50 h (Preparation, Execution, Reporting) | <div>EP</div> External event | | |

Source: VDA-QMC

Training Architecture and Certification Rules – How to become an A-SPICE® Competent Assessor 4.0



All trainings with Automotive SPICE® 4.0 content.

Training Architecture and Certification Rules – How to apply at the Certification Body?



Automotive SPICE® 4.0 Core PAM

1. Holding a valid certification as intacs® Provisional/Competent/Principal Assessor.
2. Attending the Automotive SPICE® 4.0 Upgrade training.
3. Submitting the Certificate of Attendance to the corresponding Certification Body.

→ Mandatory for re-certification of Competent and Principal Assessors latest after 3 years.

Original ID card can look different



Training Architecture and Certification Rules – How to apply at the Certification Body?



Model Extensions (Cyber Security, Hardware Engineering, Machine Learning)

1. Holding a valid certification as intacs® Provisional/Competent/Principal Assessor.
2. Attending a model extension training and passing the examination successfully.

- Nothing needs to be submitted to the corresponding Certification Body, will be registered automatically.
- ID card can be requested before standard re-certification after 3 years by paying a reduced certification fee.
- Extensions are not subject for re-certification: once the examination is passed successfully it will be valid as long as you have a valid assessor certification.

Original ID card can look different



Observations and Observers



Observations and Observers



| PROCESS EXPERT | PROVISIONAL ASSESSOR | COMPETENT ASSESSOR | PRINCIPAL ASSESSOR | INSTRUCTOR PROVISIONAL | INSTRUCTOR COMPETENT |
|---|--|--|---|--|--|
| INITIAL CERTIFICATION | | | | | |
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| LICENSE RENEWAL | | | | | |
| (no requirements) | (no requirements) | <input type="checkbox"/> <div> <div>AT,AL</div> <div>AL</div> <div>AL</div> <div>EP,AC</div> <div>any</div> <div>any</div> </div> | <input type="checkbox"/> <div> <div>AT,AL</div> <div>AL</div> <div>AL</div> <div>AC</div> <div>AC</div> <div>any</div> </div> <div>within 36 month</div> | <input type="checkbox"/> <div> <div>AT,AL</div> <div>AL</div> <div>AL</div> <div>AC</div> <div>AC,CT</div> <div>any</div> <div>CT</div> </div> | |
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| <div>AL</div> Assessment team lead ≥ 50 h (Preparation, Execution, Reporting) | <div>EP</div> External event | | | | |

Source: VDA-QMC

Observations and Observers – Purpose and Questions



Observers of new Competent Assessor and Instructor candidates have the responsibility and authority to decide if this candidate will be able to perform VDA QMC and intacs® conformant assessments and trainings, knowing and respecting the intacs® Code of Conduct.

Who should be such an observer?

- Freshly certified Competent Assessors / Instructors?
- Competent Assessors / Instructors with certain experience (e.g., 3 years of assessments or trainings)?
- Principal Assessors / Instructors Competent Level, only?

Whatever is decided, are the following aspects respected?

- Do observers follow the objective rules and dare to reject inadequate candidates?
- Is there a fair chance for everybody to become a Competent Assessor / Instructor?
- Is there any witness audit necessary to check regularly if assessors are still following the rules?

Observations and Observers – Current proposal



Observer for Competent Assessor candidates

- The Observer for this candidate must be at least an “intacs® Certified **Competent Assessor**” who has led **at least 5 assessments of category A or B**. The observer has to provide the necessary assessment logs together with the observation report to the Certification Body.

Observer for Instructor Provisional Level candidates

- The Observer for this candidate must have given **at least 5** “intacs® Certified **Provisional Assessor**” or “intacs® Certified Process Expert and Provisional Assessor” **trainings**, excluding the observed one from the initial certification.

Observer for Instructor Competent Level candidates

- The Observer for this candidate must have given **at least 2** “intacs® Certified **Competent Assessor**” **trainings**, excluding the observed one from the initial certification.

intacs® Roadmap



intacs® Roadmap



| Training Title | Certification Body | Road Map |
|---|--------------------|--|
| Automotive SPICE® 4.0 Upgrade | VDA QMC | Released in April 2024 |
| Automotive SPICE® 4.0 Process Expert | VDA QMC | Planned for October 2024 |
| Automotive SPICE® 4.0 Provisional Assessor | VDA QMC | Planned for October 2024 |
| Automotive SPICE® 4.0 Competent Assessor | VDA QMC | Planned for January 2025 |
| Hardware Engineering Extension | ECQA VDA QMC | Training available Update planned for August 2024 |
| Machine Learning Extension | VDA QMC | Planned for October 2024 |
| Cybersecurity Extension | VDA QMC | Training available Update planned for 2025 |
| Potential Analysis SPICE | VDA QMC | Planned for January 2025 |



intacs® Roadmap



| Training Title | Certification Body | Road Map |
|--|--------------------|--------------------------|
| Mechanical Engineering Extension | ECQA | Training available |
| Agile SPICE® | ECQA | Training available |
| Data Management SPICE | ECQA | Training available |
| SPICE for IT-Services | ECQA | Training available |
| Test SPICE | ECQA | Training available |
| Organization SPICE | ECQA | Planned for end of 2024 |
| Software Automation SPICE | ECQA | Planned for end of 2024 |
| Medical SPICE | ECQA | Planned for January 2025 |
| ISO 33061 Software Life Cycle Upgrade (new version of ISO 15504-5) | ECQA | Planned for October 2024 |





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