



Automotive SPICE® 4.0 and the new intacs® training concept

Bernhard Sechser / 18 July 2024

Agenda

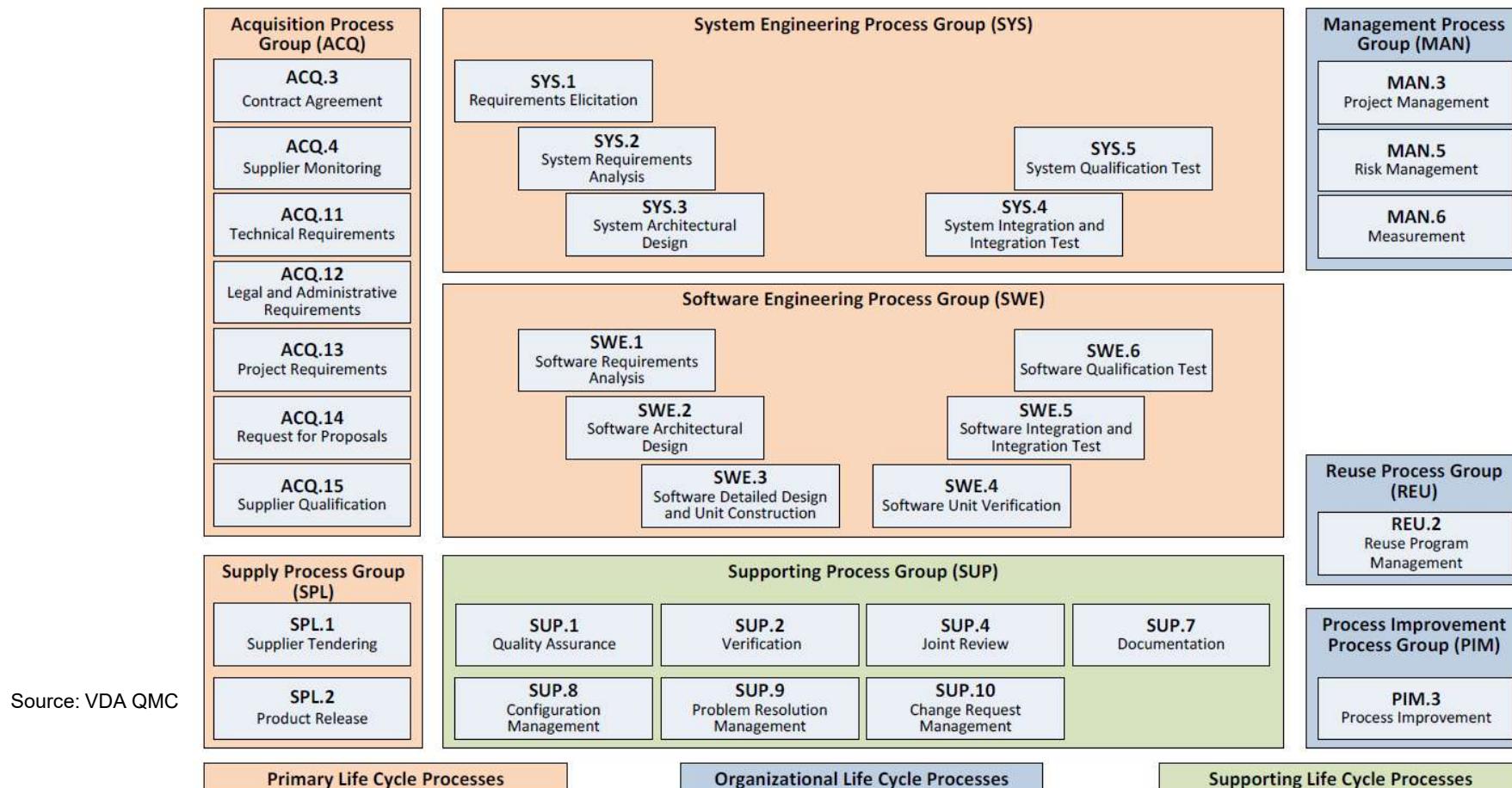


- The Idea of the “3-Levels-Qualification”
- Training Architecture and Certification Rules
- Observations and Observers
- intacs® Roadmap

The Idea of the “3-Levels-Qualification”

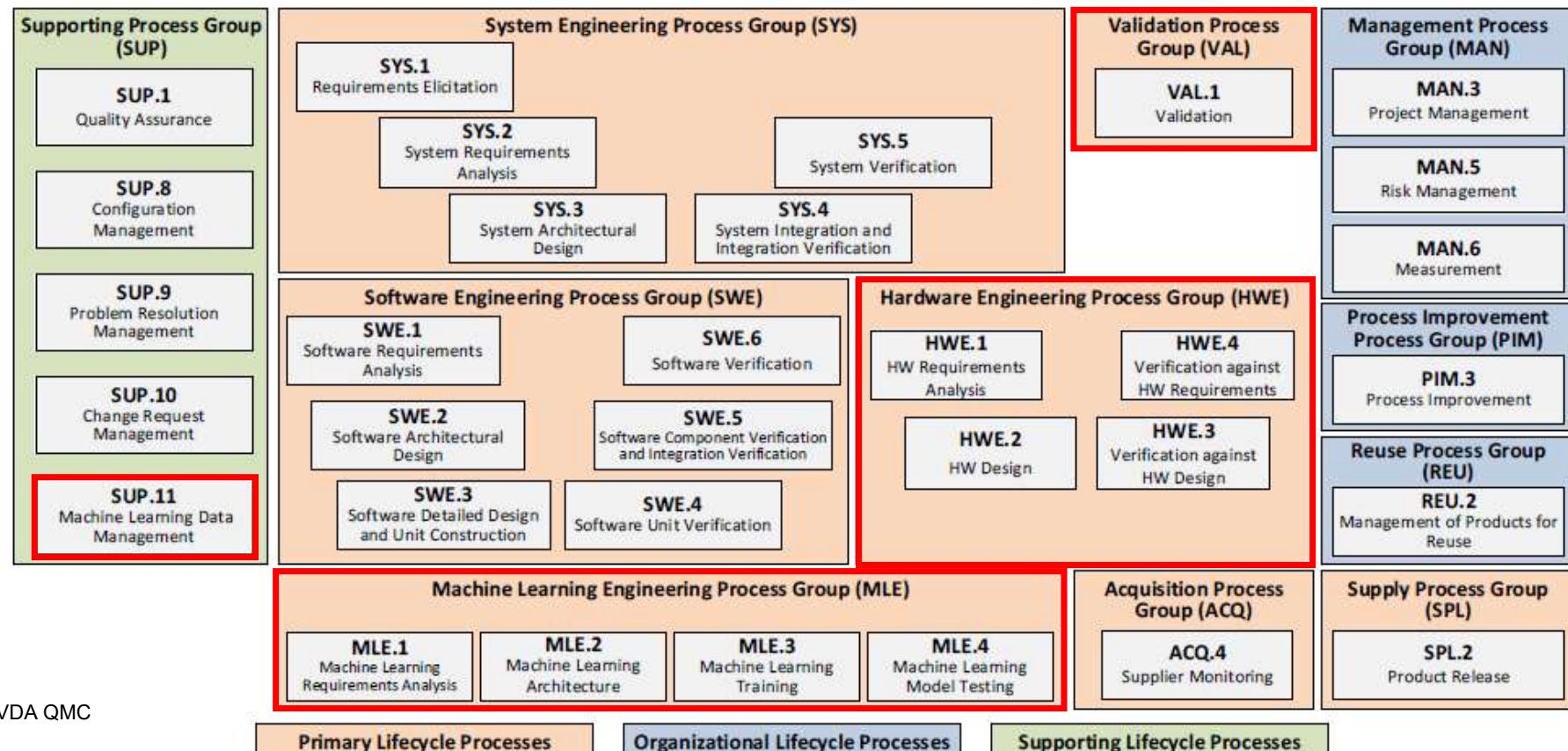


The Idea of the “3-Levels-Qualification” Automotive SPICE® v3.1



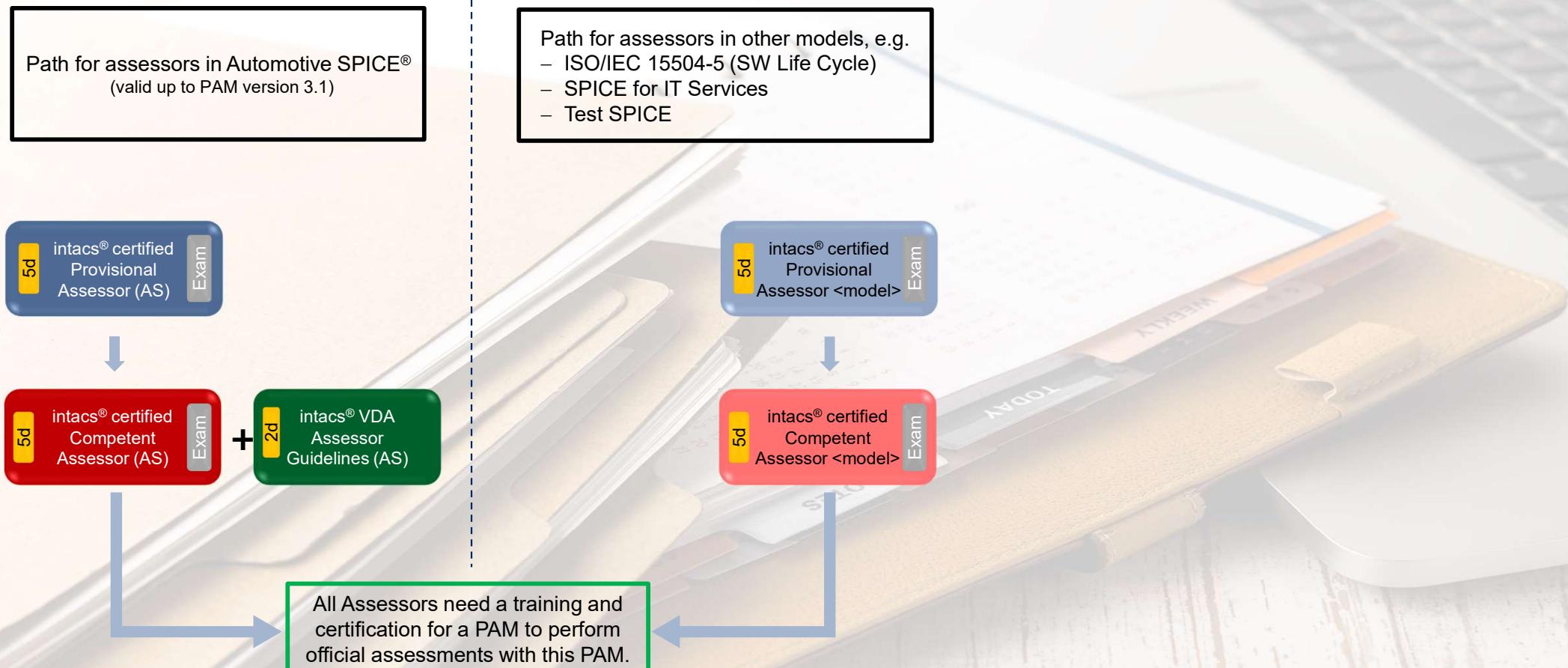
Source: VDA QMC

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



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

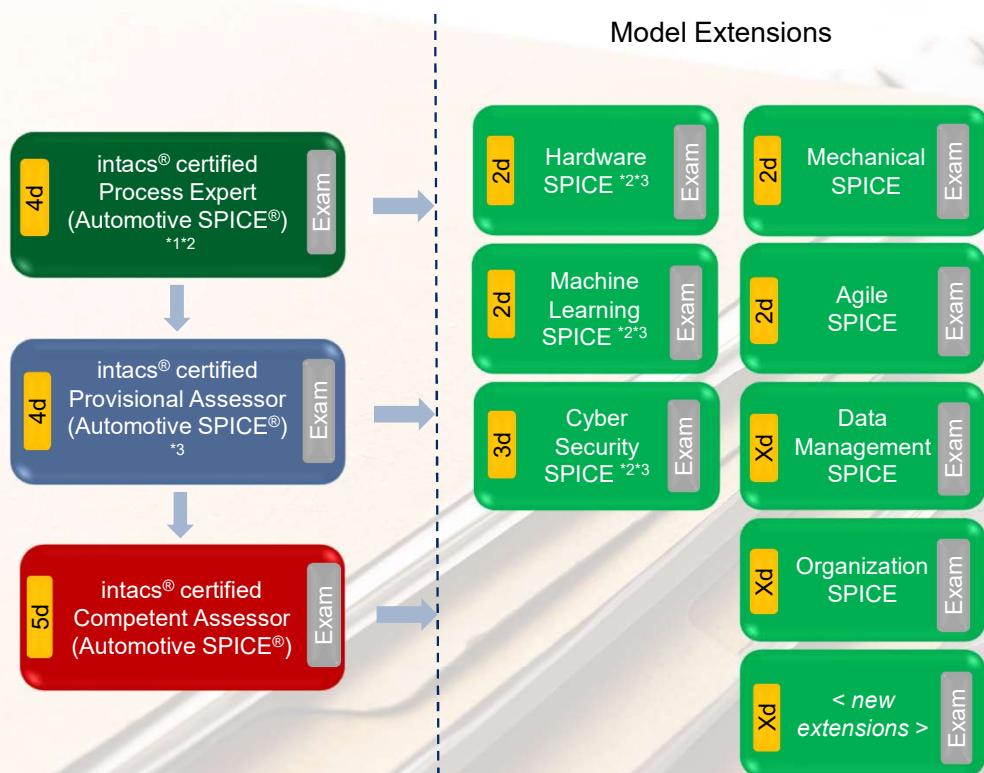


The Idea of the “3-Levels-Qualification” Challenges



- 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



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)

intacs® certified
Process Expert
(Automotive SPICE®)

➤ 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



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

intacs® certified
Provisional Assessor
(Automotive SPICE®)

- 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



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.

intacs® certified
Competent Assessor
(Automotive SPICE®)

- 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

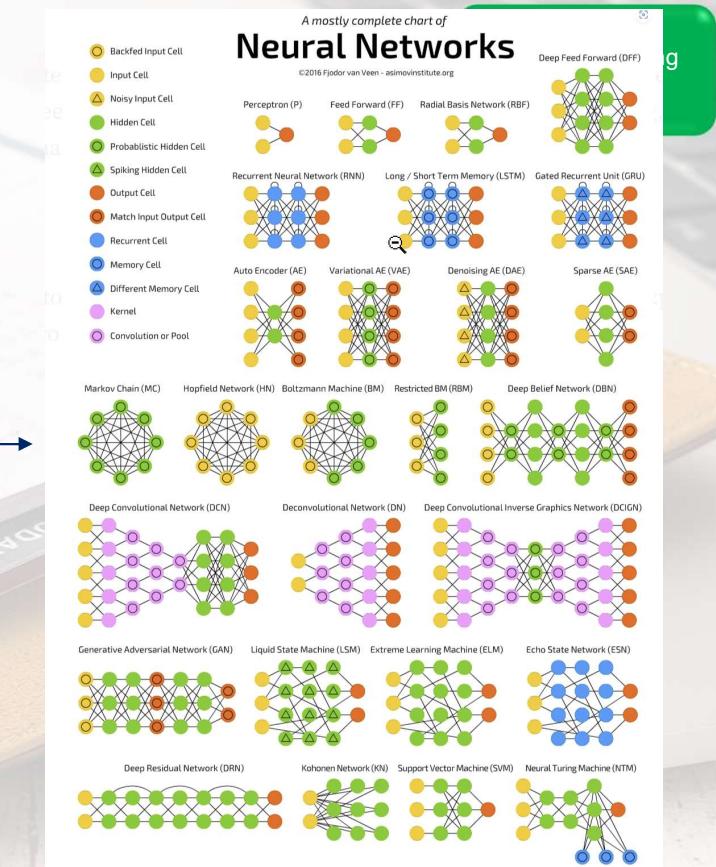
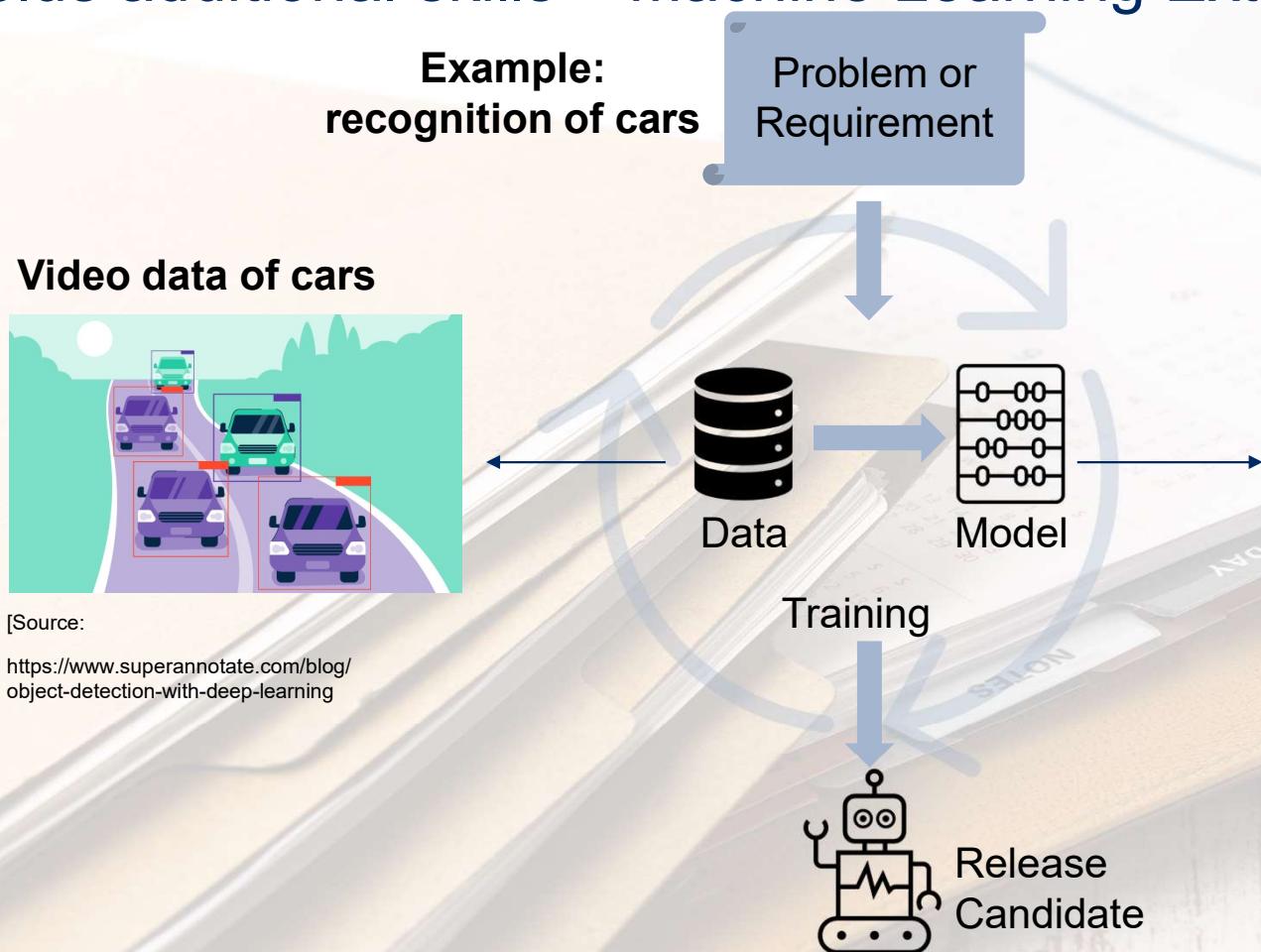
HWE.2 Hardware Design

HWE.4 Verification against
Hardware Requirements

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

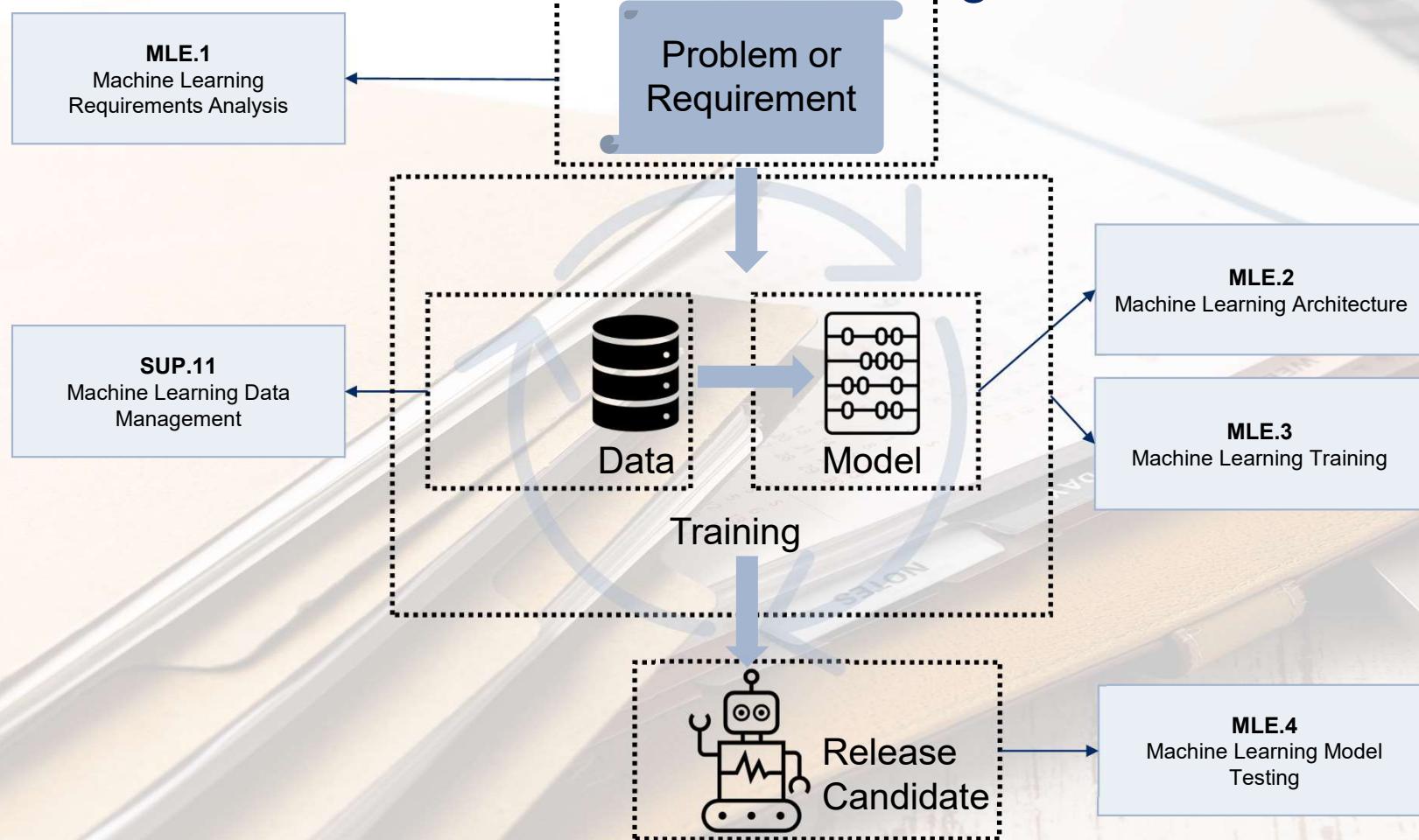
The Idea of the “3-Levels-Qualification” ... plus additional skills – Machine Learning Extension



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



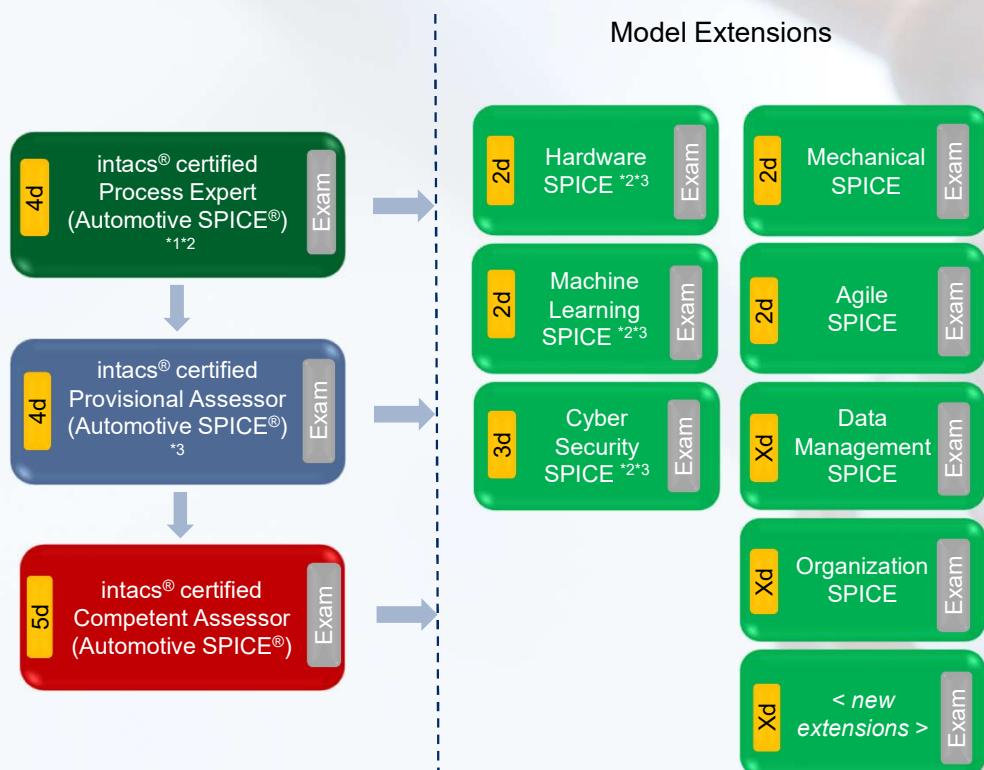
Machine Learning
SPICE



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

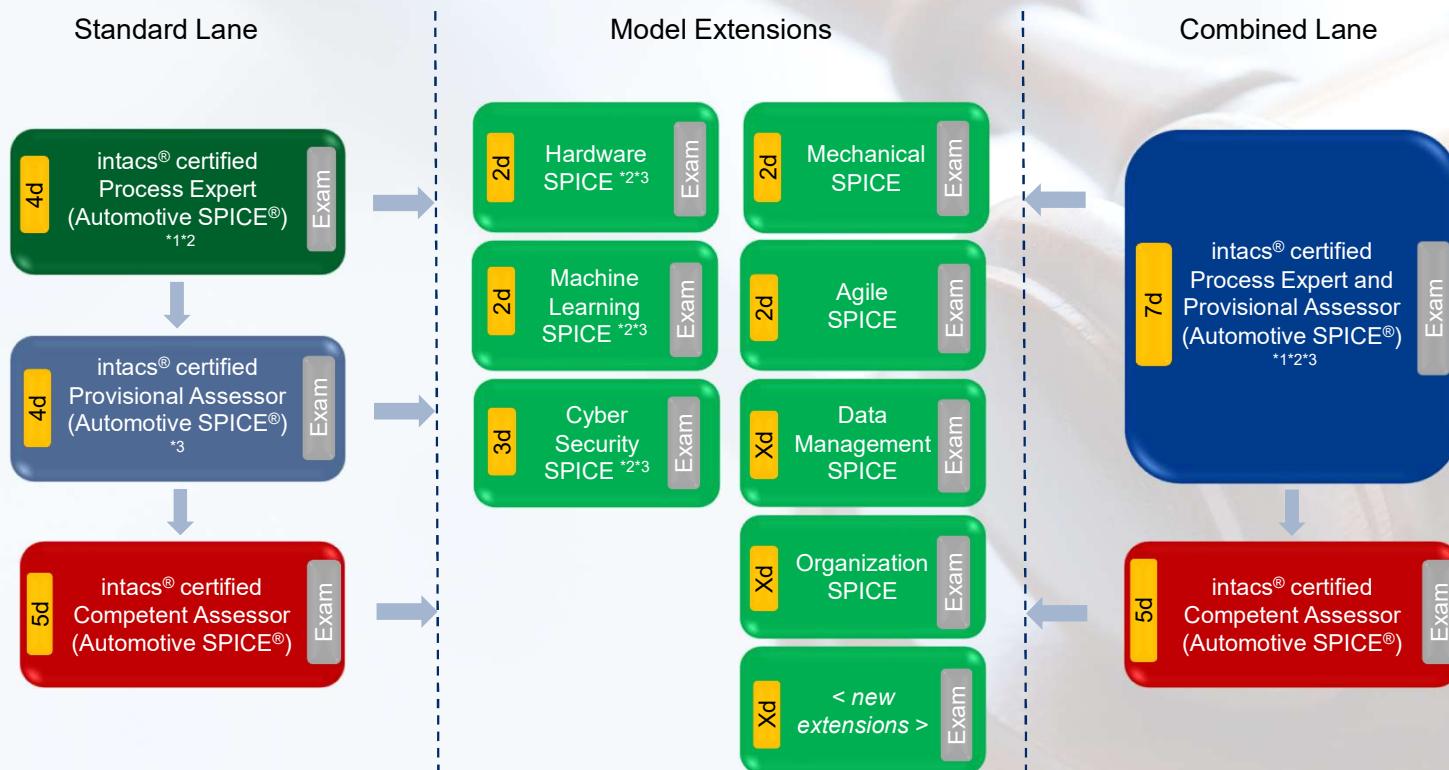
Change Request from Stakeholders:

- 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

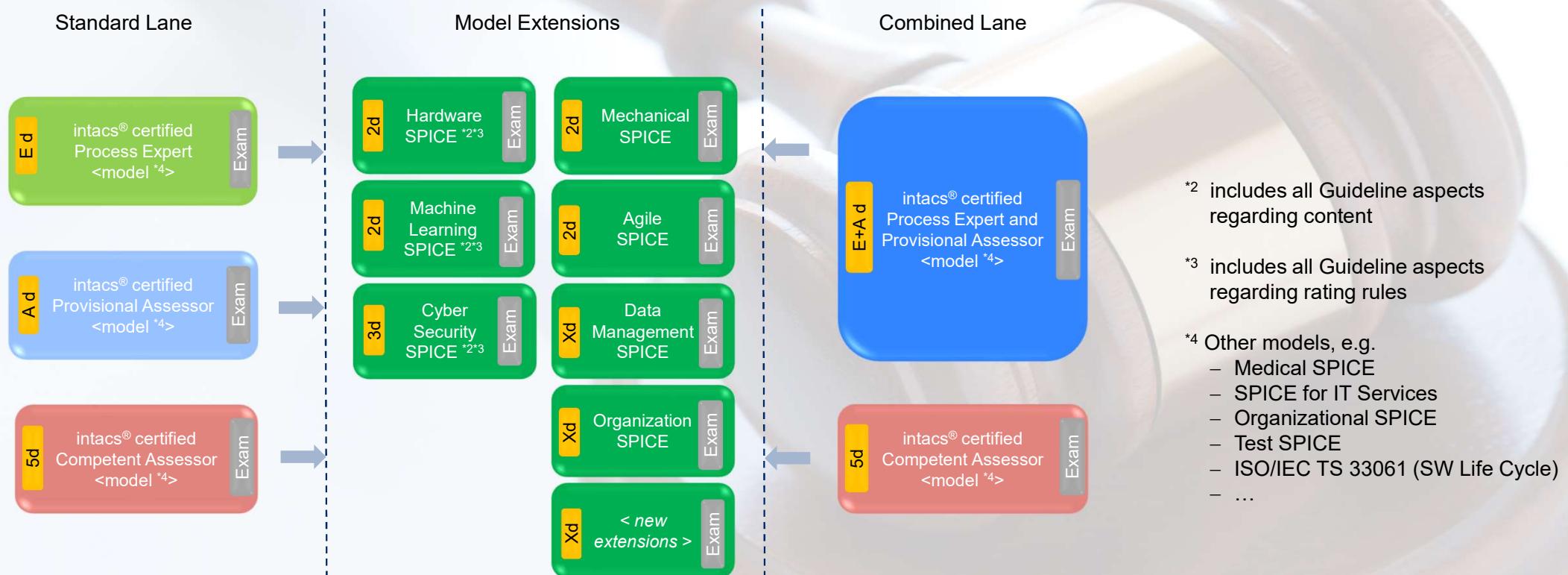


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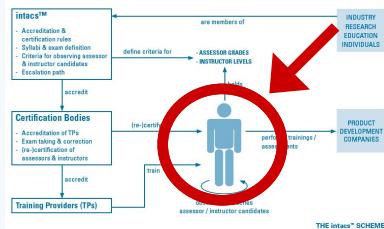
*2 includes all Guideline aspects regarding content

*3 includes all Guideline aspects regarding rating rules

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

- 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 style="display: flex; justify-content: space-around; align-items: center;"> <div style="border: 1px solid #ccc; padding: 2px 5px; margin-right: 10px;">AT</div> <div style="border: 1px solid #ccc; padding: 2px 5px; margin-right: 10px;">AT</div> <div style="border: 1px solid #ccc; padding: 2px 5px; margin-right: 10px;">AT</div> <div style="border: 1px solid #ccc; padding: 2px 5px; margin-right: 10px;">AT</div> <div style="border: 1px solid #ccc; padding: 2px 5px; margin-right: 10px;">AT</div> </div> <p>within 60 month</p>	<input type="checkbox"/> Certificate Competent level <div style="display: flex; justify-content: space-around; align-items: center;"> <div style="border: 1px solid #ccc; padding: 2px 5px; margin-right: 10px;">AL</div> <div style="border: 1px solid #ccc; padding: 2px 5px; margin-right: 10px;">AL</div> <div style="border: 1px solid #ccc; padding: 2px 5px; margin-right: 10px;">AL</div> <div style="border: 1px solid #ccc; padding: 2px 5px; margin-right: 10px;">AC</div> <div style="border: 1px solid #ccc; padding: 2px 5px; margin-right: 10px;">AC</div> <div style="border: 1px solid #ccc; padding: 2px 5px; margin-right: 10px;">any</div> </div>	<input type="checkbox"/> Certificate Principal level <input type="checkbox"/> Didactic skills <input type="checkbox"/> Training observation passed (Provisional course) <div style="display: flex; justify-content: space-around; align-items: center;"> <div style="border: 1px solid #ccc; padding: 2px 5px; margin-right: 10px;">AT,AL</div> <div style="border: 1px solid #ccc; padding: 2px 5px; margin-right: 10px;">AL</div> <div style="border: 1px solid #ccc; padding: 2px 5px; margin-right: 10px;">AL</div> <div style="border: 1px solid #ccc; padding: 2px 5px; margin-right: 10px;">AC</div> <div style="border: 1px solid #ccc; padding: 2px 5px; margin-right: 10px;">AC</div> <div style="border: 1px solid #ccc; padding: 2px 5px; margin-right: 10px;">any</div> </div> <p>within 36 month</p>	<input type="checkbox"/> Certificate Instructor (Provisional) <input type="checkbox"/> Training observation passed (Competent course)
LICENSE RENEWAL					
(no requirements)	(no requirements)	<div style="display: flex; justify-content: space-around; align-items: center;"> <div style="border: 1px solid #ccc; padding: 2px 5px; margin-right: 10px;">AT,AL</div> <div style="border: 1px solid #ccc; padding: 2px 5px; margin-right: 10px;">AL</div> <div style="border: 1px solid #ccc; padding: 2px 5px; margin-right: 10px;">AL</div> <div style="border: 1px solid #ccc; padding: 2px 5px; margin-right: 10px;">EP,AC</div> <div style="border: 1px solid #ccc; padding: 2px 5px; margin-right: 10px;">any</div> <div style="border: 1px solid #ccc; padding: 2px 5px; margin-right: 10px;">any</div> </div> <p>within 36 month</p>	<div style="display: flex; justify-content: space-around; align-items: center;"> <div style="border: 1px solid #ccc; padding: 2px 5px; margin-right: 10px;">AT,AL</div> <div style="border: 1px solid #ccc; padding: 2px 5px; margin-right: 10px;">AL</div> <div style="border: 1px solid #ccc; padding: 2px 5px; margin-right: 10px;">AL</div> <div style="border: 1px solid #ccc; padding: 2px 5px; margin-right: 10px;">AC</div> <div style="border: 1px solid #ccc; padding: 2px 5px; margin-right: 10px;">AC</div> <div style="border: 1px solid #ccc; padding: 2px 5px; margin-right: 10px;">any</div> </div>	<div style="display: flex; justify-content: space-around; align-items: center;"> <div style="border: 1px solid #ccc; padding: 2px 5px; margin-right: 10px;">AT,AL</div> <div style="border: 1px solid #ccc; padding: 2px 5px; margin-right: 10px;">AL</div> <div style="border: 1px solid #ccc; padding: 2px 5px; margin-right: 10px;">AL</div> <div style="border: 1px solid #ccc; padding: 2px 5px; margin-right: 10px;">AC</div> <div style="border: 1px solid #ccc; padding: 2px 5px; margin-right: 10px;">AC,CT</div> <div style="border: 1px solid #ccc; padding: 2px 5px; margin-right: 10px;">any</div> <div style="border: 1px solid #ccc; padding: 2px 5px; margin-right: 10px;">CT</div> </div>	

TYPES OF EXPERIENCE EVIDENCE

Assessment participation

AT Assessment team member
 ≥ 50 h (Preparation, Execution, Reporting)

AL Assessment team lead
 ≥ 50 h (Preparation, Execution, Reporting)

Passive event participation (intacs®-accepted, ≥ 6 net hours)

IP Internal event

EP External event

Active contribution (intacs®-accepted, ≥ 6 net hours)

AC Examples:

- Presentation at an intacs®-accepted event
- Member of an iNTACS Working Group
- Publication of a SPICE-related paper

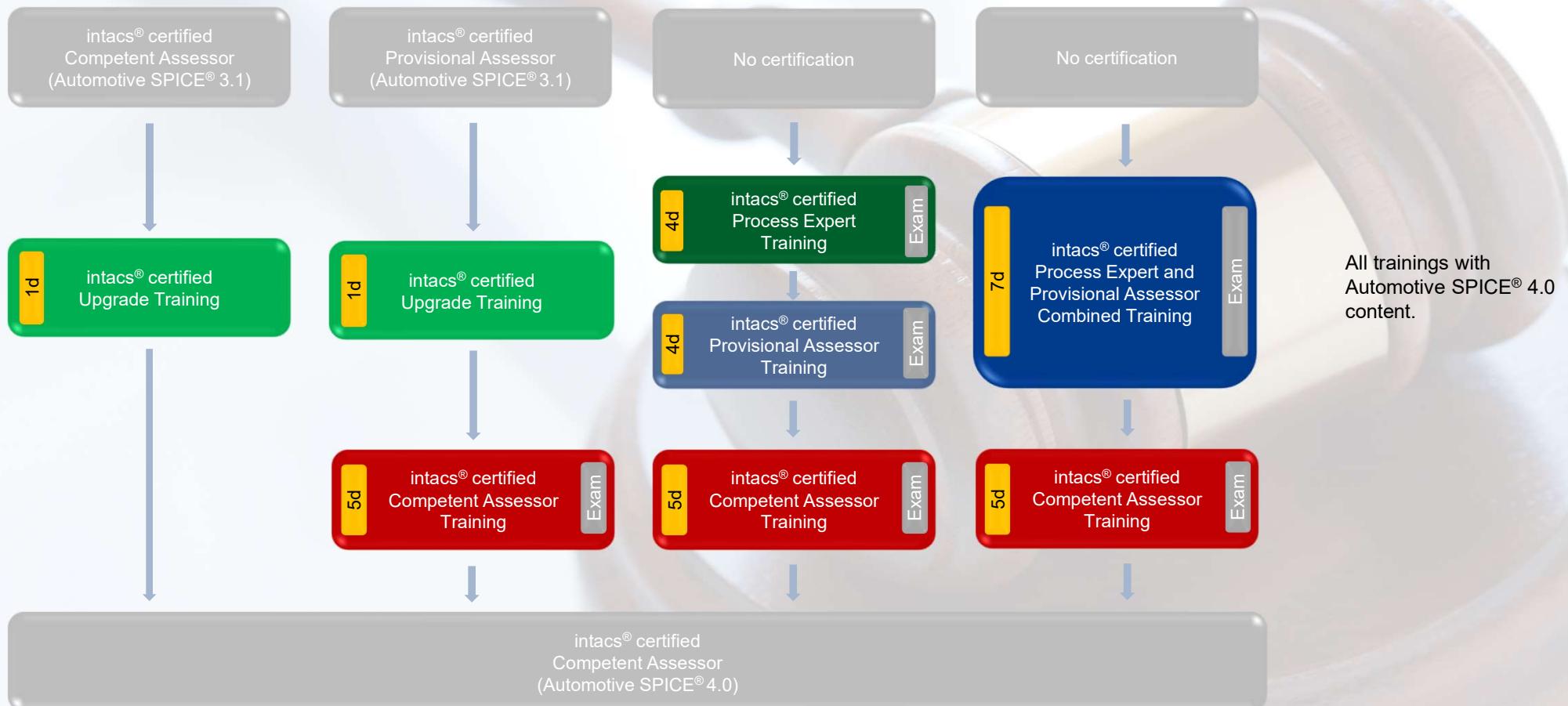
Assessor training course held

CT

- intacs® Process Expert training
- intacs® Provisional Assessor training
- intacs® Competent Assessor training

Source: VDA-QMC

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



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

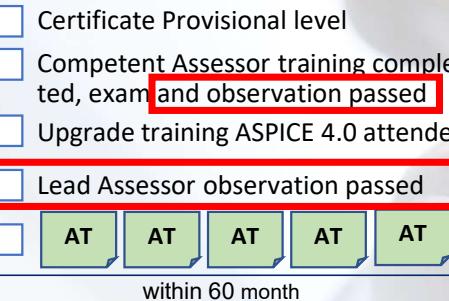
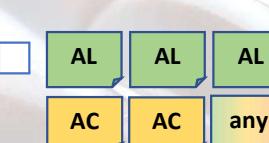


Observations and Observers



Observations and Observers



PROCESS EXPERT	PROVISIONAL ASSESSOR	COMPETENT ASSESSOR	PRINCIPAL ASSESSOR	INSTRUCTOR PROVISIONAL	INSTRUCTOR COMPETENT
INITIAL CERTIFICATION					
<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 SPICE 4.0 attended <input type="checkbox"/> Lead Assessor observation passed 	<input type="checkbox"/> Certificate Competent level 	<input type="checkbox"/> Certificate Principal level <input type="checkbox"/> Didactic skills <input type="checkbox"/> Training observation passed (Provisional course)	<input type="checkbox"/> Certificate Instructor (Provisional) <input type="checkbox"/> Training observation passed (Competent course)
LICENSE RENEWAL					
(no requirements)	(no requirements)				
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		
 Assessment team member ≥ 50 h (Preparation, Execution, Reporting)	 Internal event	 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 	 • intacs® Process Expert training • intacs® Provisional Assessor training • intacs® Competent Assessor training		
 Assessment team lead ≥ 50 h (Preparation, Execution, Reporting)	 External event				

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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