



Introduction to VDA POA (Potential Analysis) and First Return on Experience

Gate4SPICE

Christophe Debou
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**Autonomy Safety /
SOTIF**

Agile

Christophe Debou, Principal at Kugler Maag Cie by UL Solutions



Position

Principal, Director Central And Eastern Europe

Computer Science Engineer (Ecole Nationale Supérieure de Sciences Lannion), 1990

Languages

French, English, German, Polish and some korean

Credentials

- Automotive SPICE certified Competent Assessor including Cybersecurity PAM, Data Management, SPICE for IT Services
- CMMI Institute-authorized trainer for Introduction to CMMI Version 1.3 / 2.0 (DEV, SVC) and Supplement CMMI for Services
- SCRUM Master (SCRUM Alliance)
- SAFe® 4 Certified Agilist
- ITIL V3 Foundation

Experiences

- Hands-on experiences in managing and consulting process improvement programmes (CMMI® or Automotive-SPICE based) as well as Agile transformation initiatives in different cultural environments and business domains:
 - Automotive (OEMs, Tier X), Finance, IT, ...
 - Europe, Asia (South Korea), North America
 - Development and Service Management organizations

Experiences furthermore

- Long and diverse experience in assessments and gap analysis (Automotive SPICE, CMMI)
- Long-term experience in business Development across Central and Eastern Europe
- Active on the Korean Market since 2013, supporting Automotive SPICE deployment
- Many years of training and presentation experience: Project Management, Automotive-SPICE CMMI., ...
- Senior Management Experience:
 - P&L Responsibility for one business unit
- Regular speakers at international conferences
- Chairman of “Agile in Automotive” Conference

Previous Positions

- 2001 - 2006
ComArch SA, Cracow (Poland),
Vice-President, Telecommunication Business Unit
- 1997 – 2001
Q-Labs GmbH, Operating Manager
- 1990 – 1997 Alcatel Belgium, France, Austria
Manager of software process and technology

Agenda

- Background of POA
- Introduction to model and rationale
- Guidelines
- Experience in performing POA



Why to Standardize POA Approach?

- VW group has implemented POA for years as part of their RFQ Process
- Similar approaches used by other OEMs and Tier 1
- Need for standardization of the approach across the industry
 - Reduce the overhead of suppliers to deal with different methods and interpretation
 - Reusability of results
 - Qualification of assessors
- More and more new suppliers to the Automotive Industry (SDV Context) that needs to be qualified

Different Use Cases for POA

- Before awarding
 - Initial evaluation of capability of a new supplier since no reference projects up to now or not suitable to the scope of the RFQ (Different product, team)
 - Aim at risk identification of a potential partnership
 - Avoid a costly assessment
- During projects
 - Measure process maturity rating to pass Quality Gates/Milestones require a more appropriate and lean method
 - Check evidence of process improvements
 - Preparation of a full assessment
 - Self-estimation



Exemplary project



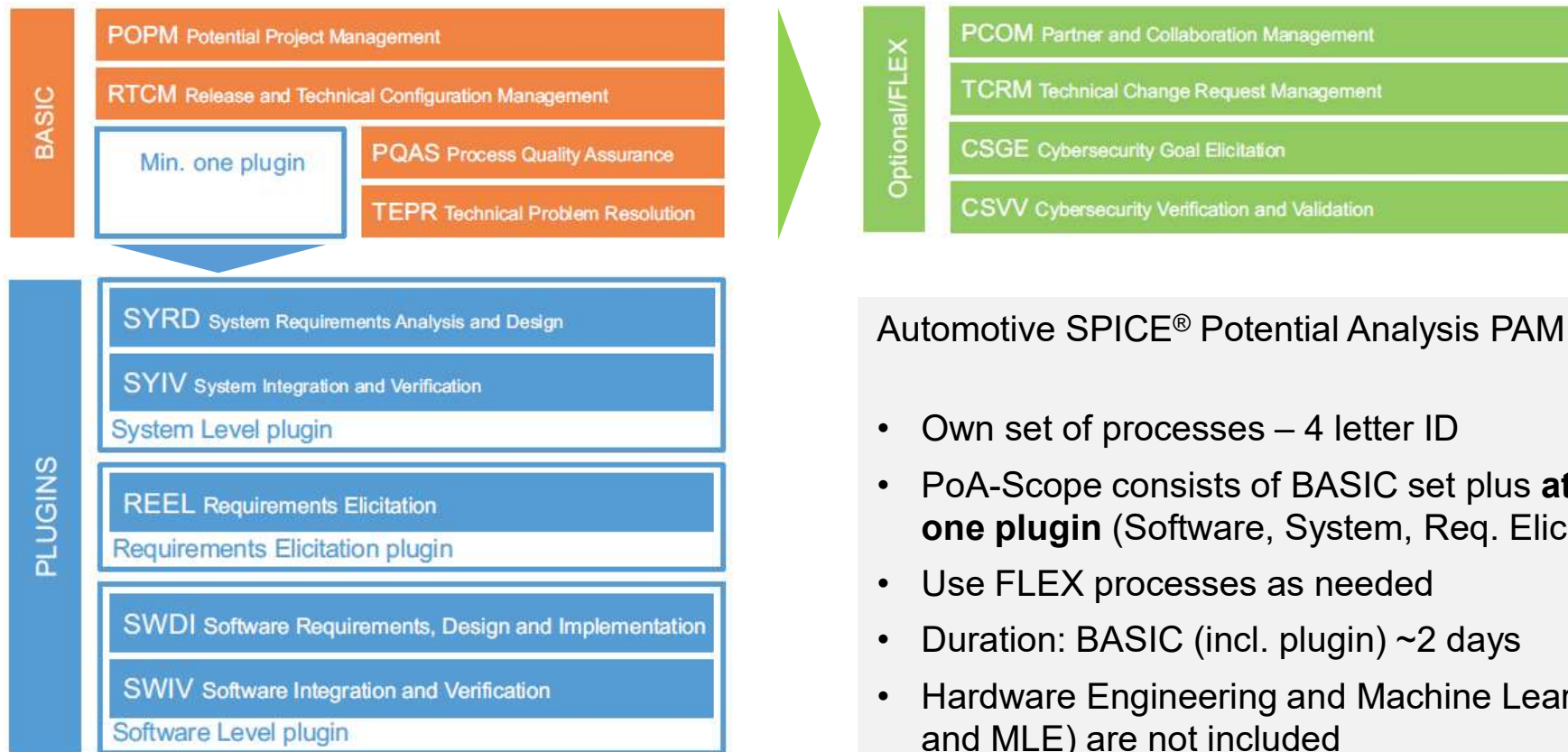
Golden Sample

„Show case“

Limited Scope

- Automotive SPICE® Potential Analysis focuses on **engineering and technical areas** and limits the organizational aspects to a minimum.
 - Organizational aspects are considered mainly at Project Management (POPM).
 - Configuration Management (RTCM) and Problem Resolution (TEPR) are restricted to technical scope
- The Automotive SPICE® Potential Analysis is reduced and limits the references for people, stakeholders, and changes to those that are related to technical efforts, only.
 - Such may exclude human resources management, qualification ...

Automotive SPICE® Potential Analysis PAM/PRM Structure and content



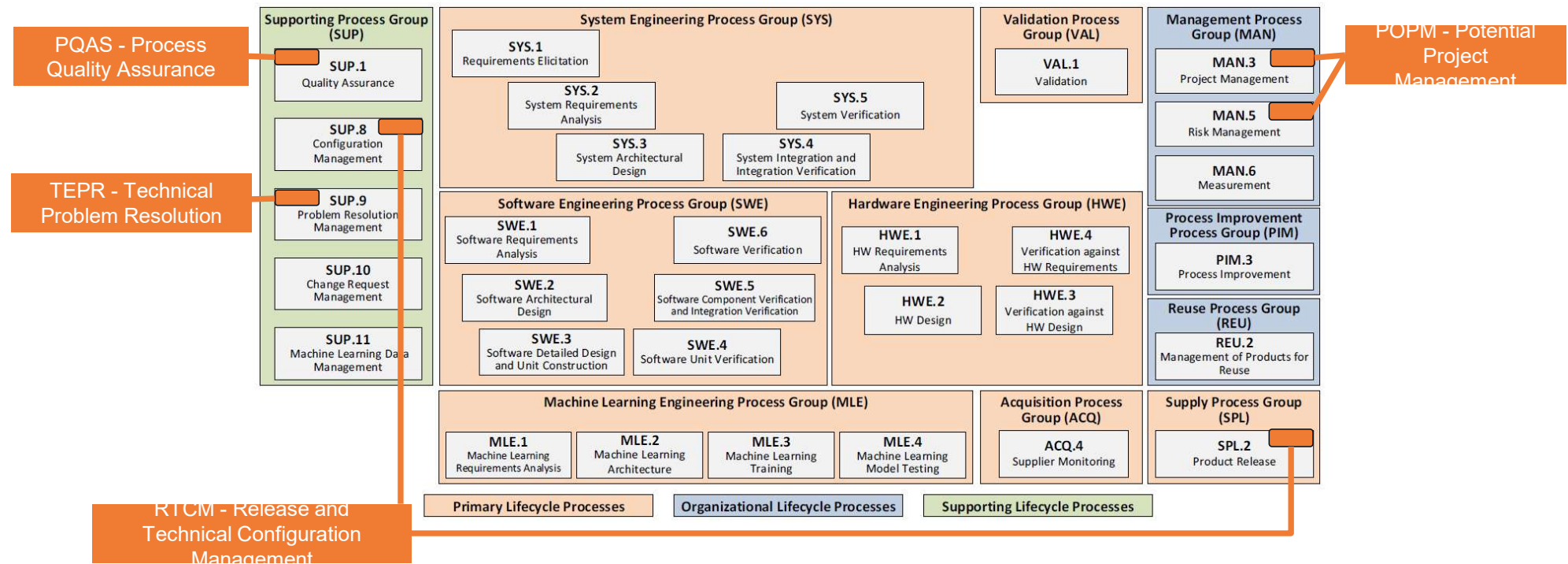
Automotive SPICE® Potential Analysis PAM defines

- Own set of processes – 4 letter ID
- PoA-Scope consists of BASIC set plus **at minimum one plugin** (Software, System, Req. Elicitation)
- Use FLEX processes as needed
- Duration: BASIC (incl. plugin) ~2 days
- Hardware Engineering and Machine Learning (HWE and MLE) are not included

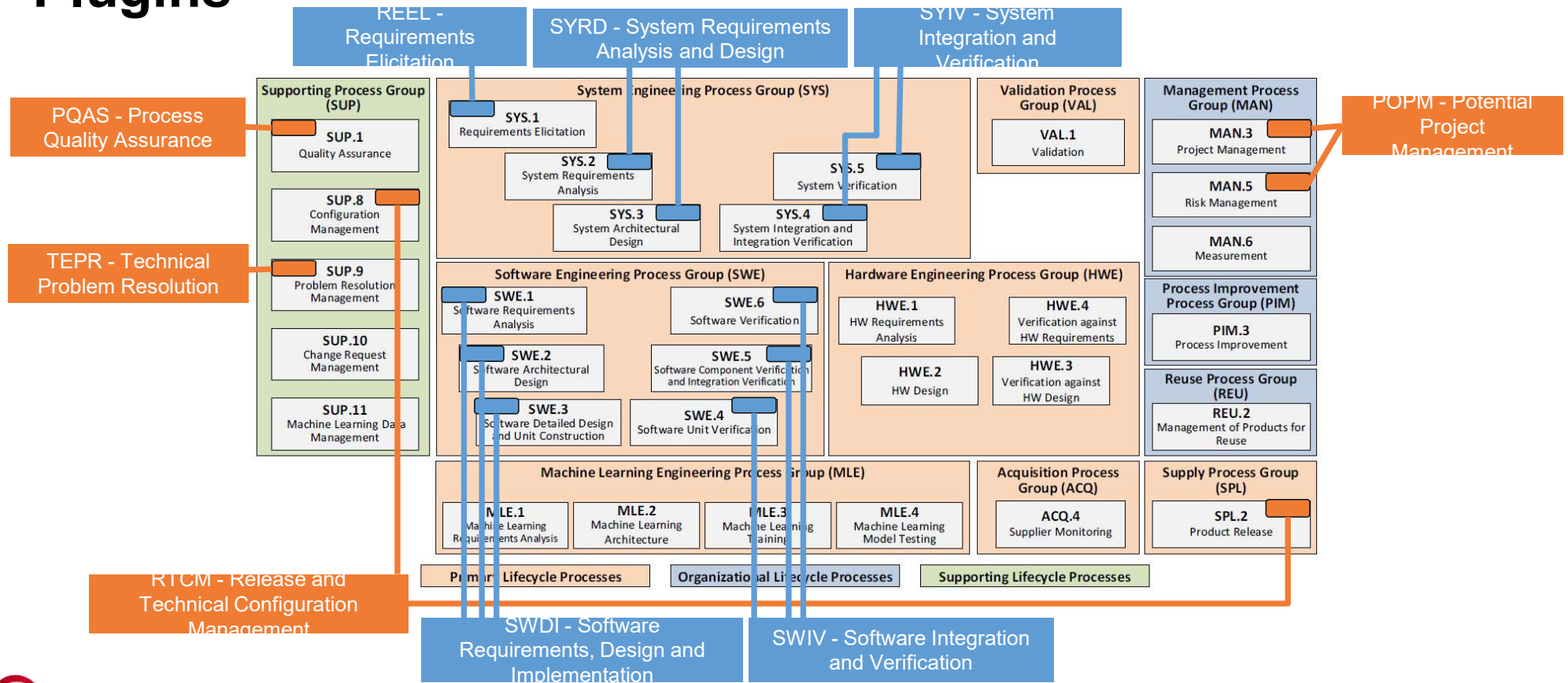
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Automotive SPICE® Potential Analysis Process Reference Model

1st ed. Assignment to Automotive SPICE® PRM v4.0 – Basic Processes



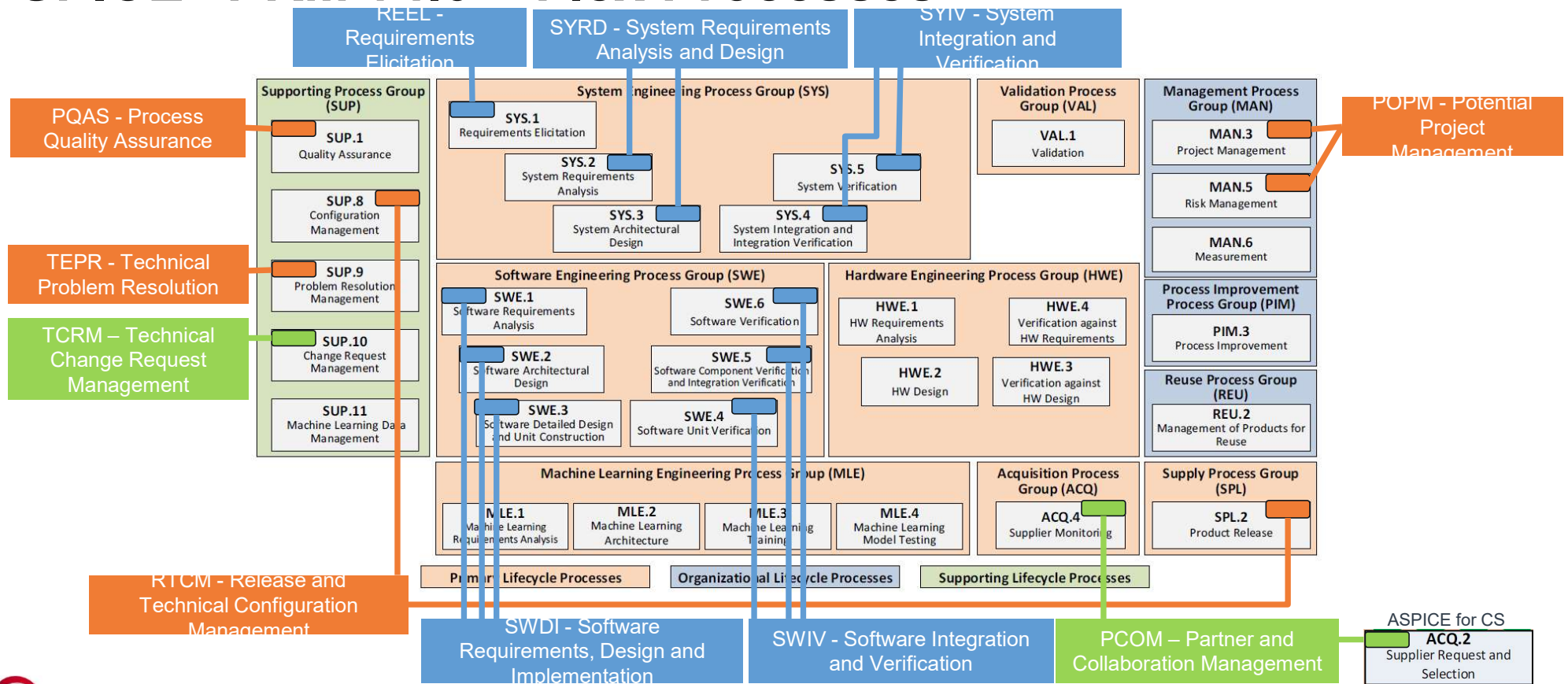
Automotive SPICE® Potential Analysis Process Reference Model 1st ed. Assignment to Automotive SPICE® PRM v4.0 - Plugins



source: intacs® Certified Automotive SPICE® Potential Analysis Training

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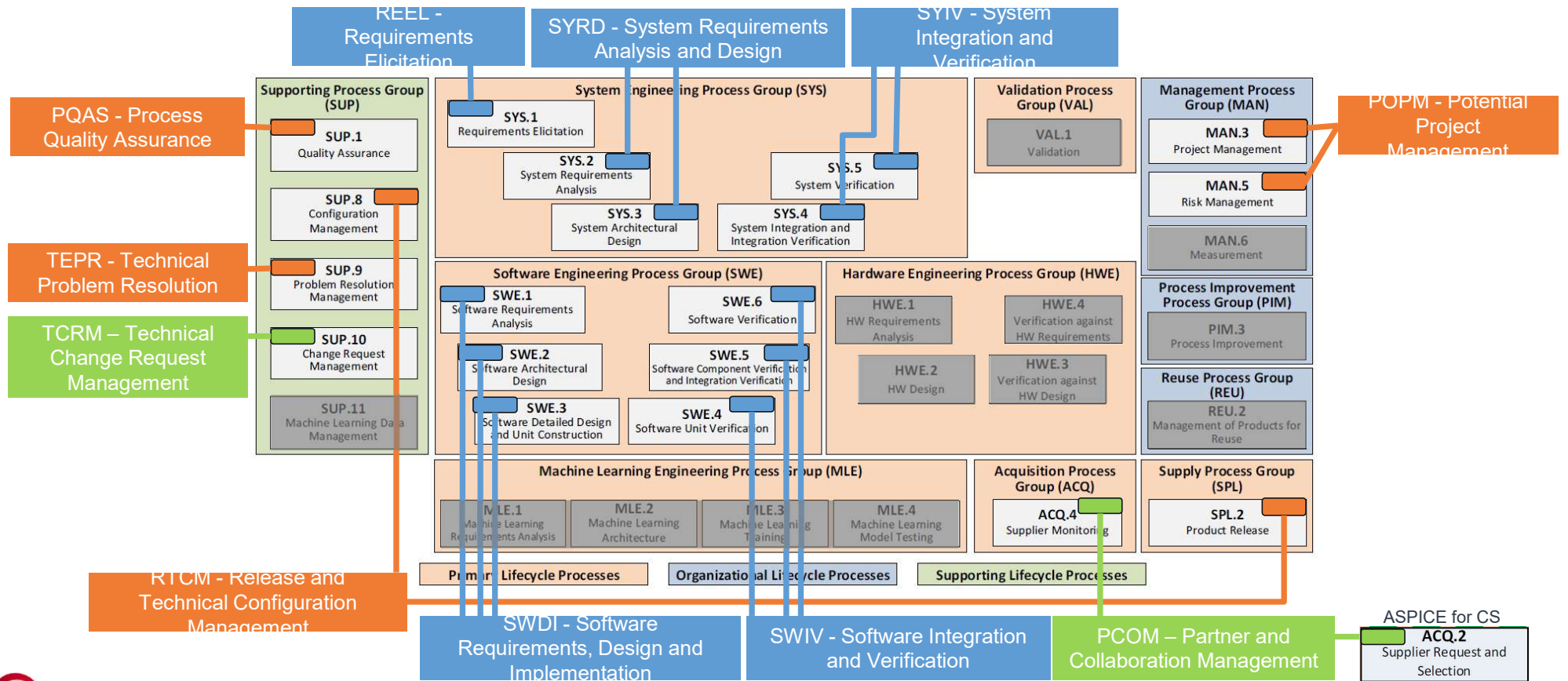
Automotive SPICE® Potential Analysis Process Reference Model 1st ed. Assignment to Automotive SPICE® PRM v4.0 – Flex Processes



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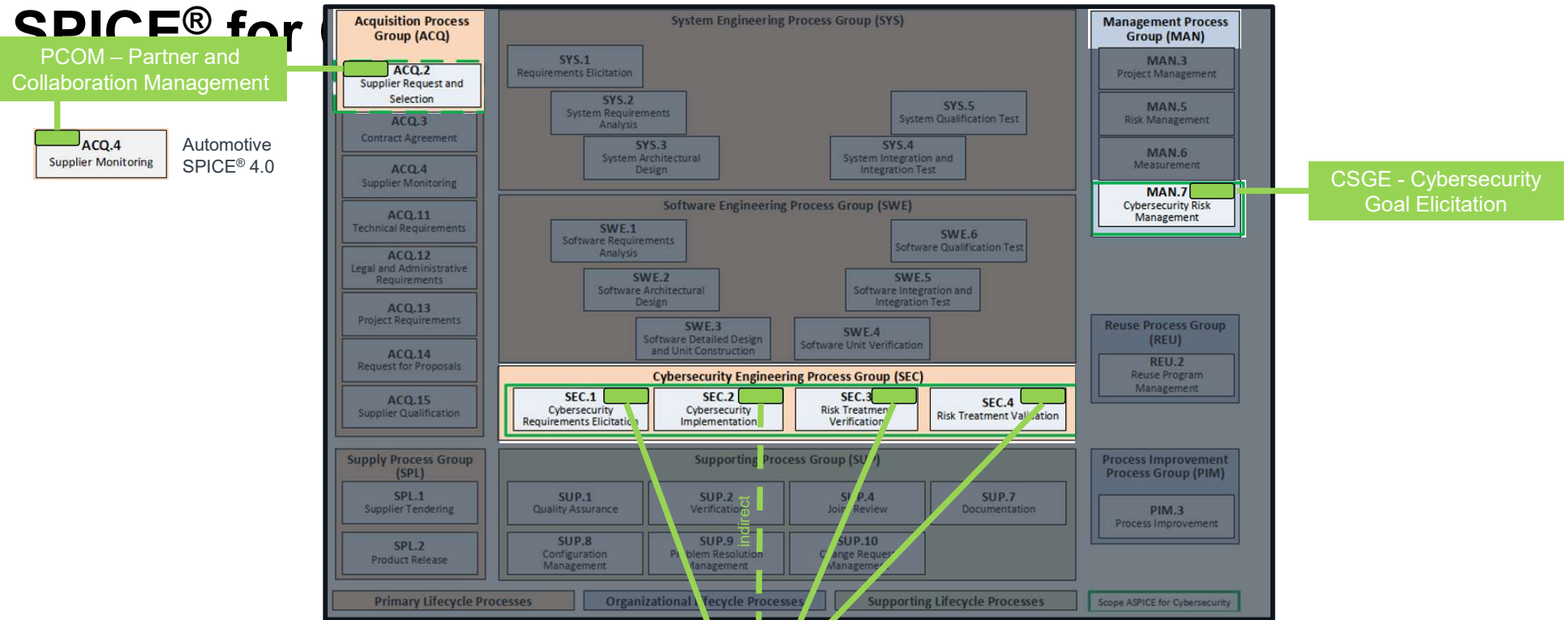
Automotive SPICE® Potential Analysis Process Reference Model 1st ed. Assignment to Automotive SPICE® PRM v4.0 – Omitted Processes



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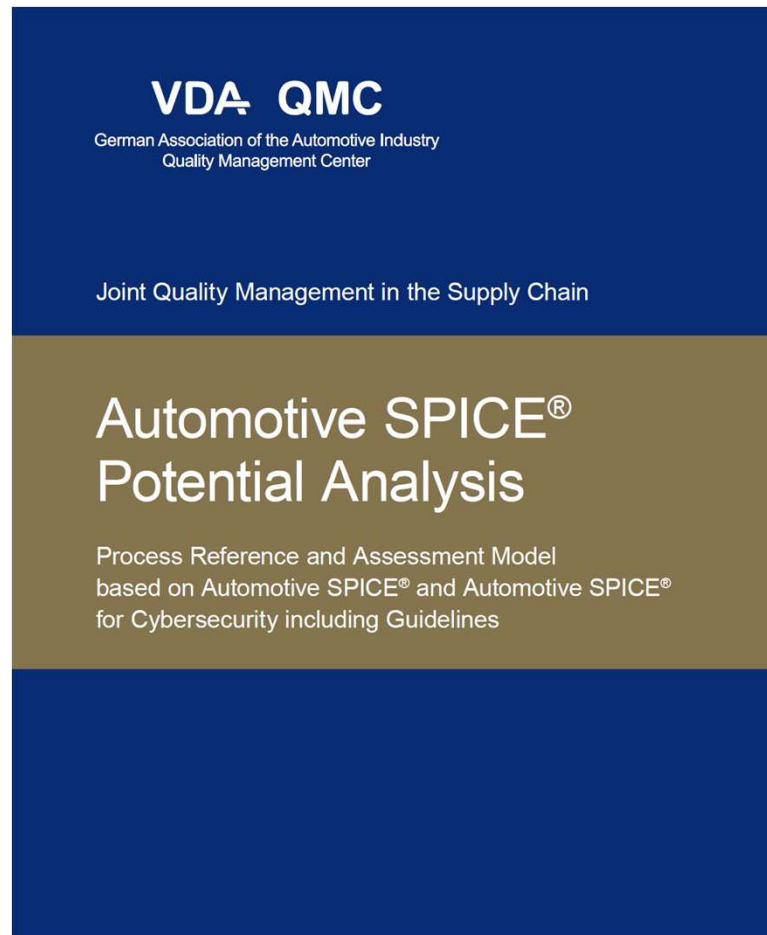
Automotive SPICE® Potential Analysis Process Reference Model 1st ed. Assignment to Automotive SPICE® for



*Process CSVV covers also aspects from SEC.1 and SEC.2 but naming is on Cybersecurity Verification and Validation

source: intacs® Certified Automotive SPICE® Potential Analysis Training

Preview of the Document



Alignment with Automotive SPICE® 4.0

- Same terminology, concepts and **the same look and feel** e.g. process description,
- Information Items are from:
 - Automotive SPICE® 4.0
 - Automotive SPICE® for Cybersecurity 1.0
- However less characteristics defined within the information items are applicable for the Automotive SPICE® POA
- Output Information Items are a **sub-set** of the ones in Automotive SPICE® 4.0

Process ID
POPM
Process name
Potential Project Management
Process purpose
The purpose is to identify and manage activities of an exemplary project to develop a product, manage risks and monitor organizational problems related to the project.
Process outcomes
1) Activities are identified, sized, and estimated
2) Technical feasibility of the activities is evaluated
3) Interfaces of the project are identified and monitored
4) Schedule for execution of the project is developed and monitored
5) Progress of the activities is reviewed
6) Risks are managed continuously
7) Organizational problems related to the project are recorded, analyzed, and monitored

Potential Project Management	Outcome 1	Outcome 2	Outcome 3	Outcome 4	Outcome 5	Outcome 6	Outcome 7
Output Information Items							
08-56 Schedule				X	X		
14-10 Work package	X	X				X	
15-06 Project status				X	X	X	X
15-08 Risk analysis						X	
15-09 Risk status						X	
08-55 Risk measure						X	
13-07 Problem							X
15-12 Problem status							X
14-02 Corrective action				X	X		
14-50 Stakeholder groups list			X				
Base Practices							
BP1: Identify, define, and estimate activities	X						
BP2: Ensure technical feasibility	X	X					
BP3: Identify and monitor project interfaces			X				
BP4: Define and monitor project schedule				X			
BP5: Review progress of the activities			X	X	X		
BP6: Manage risks						X	
BP7: Analyze and monitor organizational problems to the project							X

08-60	Verification Measure	• A verification measure can be a test case, a measurement, a calculation, a simulation, a review, an optical inspection, or an analysis • The specification of a verification measure includes - pass/fail criteria for verification measures (test completion and ending criteria) - a definition of entry and exit criteria for the verification measures, and abort and re-start criteria • Techniques (e.g., black-box and/or white-box-testing, equivalence classes and boundary values, fault injection for Functional Safety, penetration testing for Cybersecurity, back-to- back testing for model-based development, ICT) • Necessary verification environment & infrastructure • Necessary sequence or ordering
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Rating Approach in Automotive SPICE® Potential Analysis

- **Own Automotive SPICE® Potential Analysis measurement framework**, avoids mixing and confusion with Automotive SPICE® assessment rating.
- **Use of Traffic Lights**
 - Less than 50% - critical deviations (CL0) →  Fragmentary 0 to ≤ 50% achievement
 - Major deviation that need improvement before collaboration (CL1) →  Valid > 50% to ≤ 75% achievement
 - No major deviation (CL1) →  Satisfactory > 75% to ≤ 100% achievement
- Traffic lights also used for rating BPs
- Focus only on CL1, higher levels are inappropriate because of the reduced content
- **Automotive SPICE® result ≠ Automotive SPICE® Potential Analysis result**



≠



Rationales in Automotive SPICE® Potential Analysis

- Rationales are documented to explain the scope and its reduction due to limited time for performance of POA and also limitation of the exemplary project

There are two different types of rationales defined:

- RAG → **R**ationales of **g**eneric character reflecting specific circumstances for **all** processes.
- RAP → **R**ationales of **p**rocess specific character, which affect **one or a few** processes only.

Rationales in Automotive SPICE® Potential Analysis

RAGs	Generic Rationales	5
RAG.1	Resources	1
RAG.2	Scope of work	1
RAG.3	Feasibility	1
RAG.4	Responsibilities	1
RAG.5	Communicate and agree	1

RAPs	Process Specific Rationales	23
RAP.1	Covering PQAS	1
RAP.2	Covering POPM; TEPR; TCRM	1
RAP.3	Covering POPM	1
RAP.4-6	Covering TEPR	3
RAP.7-8	Covering TCRM	2
RAP.9-12	Covering RTCM	4
RAP.13-14	Covering PCOM	2
RAP.15-19	Covering CSGE;CSVV	5
RAP.20	Covering REEL	1
RAP.21	Covering SYRD; SWDI	1
RAP.22	Covering SYIV; SWIV	1
RAP.23	Covering PQAS; POPM; TEPR; TCRM; RTCM; PCOM	1

RAG – Rationales of Generic Character

RAG → Rationales of generic character reflecting specific circumstances for **all** processes

Limitations RAG

RAG.1 Resources

RAG.2 Scope of work

RAG.3 Feasibility

RAG.4 Responsibilities

RAG.5 Communicate and agree

- “*Resources*” of human capital and personnel in a project are not in the scope
- Scope of work is not reviewed
- Feasibility solely focused on technical aspects, including timeframe and effort, no resources or competencies feasibility
- Responsibilities and qualification of resources not checked as well
- Communication not in scope

RAP – Rationals of Process Specific Character

RAP → **R**ationales of **p**rocess specific character, which affect **one or a few** processes only.

RAP.1 - Process assurance only

RAP.2 - Organizational aspects

RAP.3 - Risk identification

RAP.4 - Identification of problems

RAP.5 - Urgent resolution and alert

RAP.6 - Tracking problems to change requests

RAP.7 - Technical changes only

RAP.8 - Review of implementation
Approval before implementation

RAP.9 - Configuration items

RAP.10 - Baseline completeness and consistency

RAP.11 - Delivery

RAP.12 - Access rights

RAP.13 - Partner and Collaborations

RAP.14 - Quotation and contracts

RAP.15 - Scope of cybersecurity

RAP.16 - Prioritization of threats

RAP.17 - Monitoring changes of cybersecurity

RAP.18 - Vulnerability Analysis

RAP.19 - Cybersecurity Risk Treatment
Implementation

RAP.20 - Obtain stakeholder expectations
and requests

RAP.21 - Prioritization of requirements

RAP.22 - Select verification measures

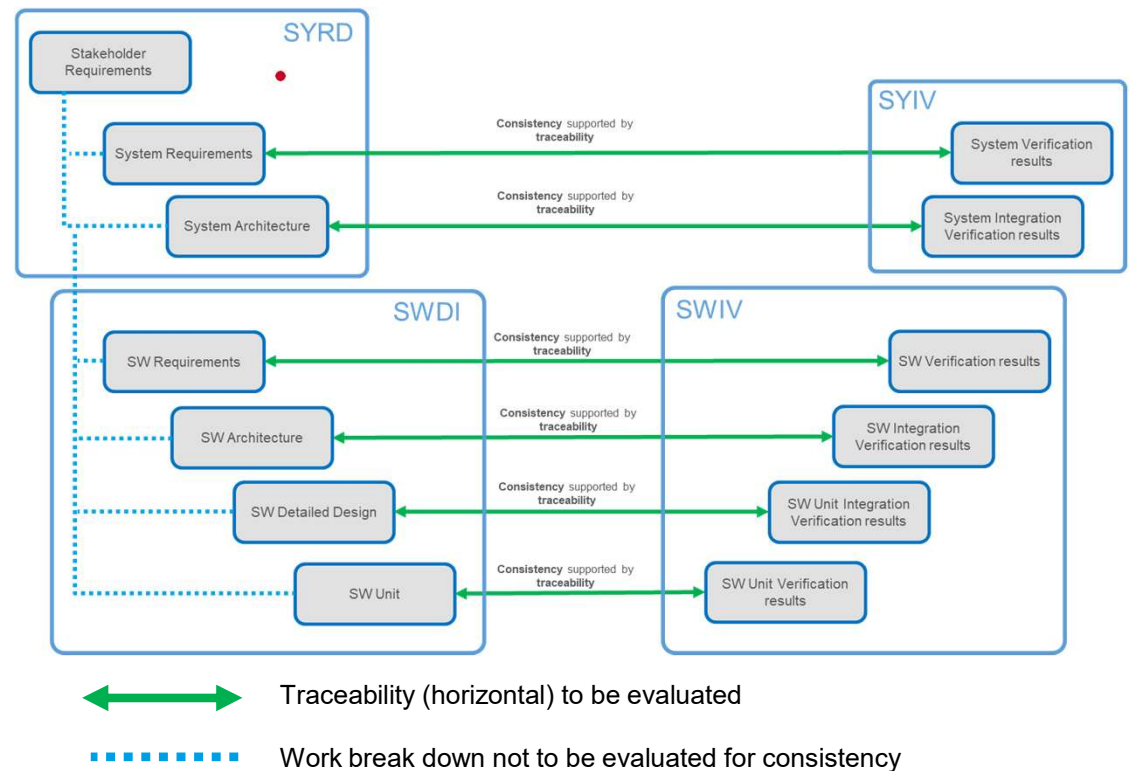
RAP.23 - Cross relationships

Key Topics Removed from A-SPICE 4.0

- Any organizational topics
 - What ever relates to resources (Skills, responsibilities, availability, ...)
- Complete vertical traceability
- Work product quality Assurance
- Nontechnical problems or changes
- Non engineering Cis
- Specific BPs e.g.
 - Impact on system context /Operating environment
 - Architecture analysis
 - Urgent resolution / Alert notification
 - ...

ASPICE PoA structure and content

- Traceability concept within plugins for System and Software
- Consistency and traceability is a major element and benefit in ASPICE.
- ASPICE PoA intends to keep this strength, while still must reduce the effort and depth on it.
- The concept is based on horizontal traceability for consistency.
- Vertical traceability is not explicitly measured, enforced through the work breakdown.



Organization of POA

- Lead and Co-assessor with the same rules as for full Automotive SPICE assessment
- Theoretically 2 days (See agenda) although rather unrealistic
- Selection of exemplary project /Golden sample
 - Completed
 - Deployed commercially
 - Does not have to be specifically Automotive
- Agree on the project scope
 - Full project (standard case)
 - Given release
- Result is a report, similar to formal assessment

Exemplary agenda to perform Automotive SPICE® Potential Analysis

Day 1			Duration [Min]	Day 2			Duration [Min]
ID	Process			ID	Process		
	Kick-off Assessment Team		30		Take over Day 1		30
	Welcome & Introduction		30	REEL	Requirement Elicitation		45
POPM	Potential Project Management		75		Consolidation		15
	Consolidation		15	SYRD	System Requirement Analysis and Design		45
PQAS	Process Quality Assurance		75		Consolidation		15
	Consolidation		15	SYIV	System Integration and Verification		45
	Lunch		60		Consolidation		15
RTCM	Release and Technical Configuration Management		45		Lunch		60
	Consolidation		15	SWDI	Software Requirements, Design and Implementation		45
TEPR	Technical Problem resolution		45		Consolidation		15
	Consolidation		15	SWIV	Software Integration and Verification		45
TCRM	Technical Change Request Management		45		Consolidation		15
	Consolidation		15		Report creation		45
	Wrap-Up		30		Feedback & Results		30

Automotive SPICE® Potential Analysis Guidelines

- Guidelines for Automotive SPICE® Potential Analysis provides addition to the PAM/PRM:
 - General information per process
 - Additional information on specific topics (e.g., SWIV: Automated Testing, Explorative Testing)
 - Additional hints how to rate within a process
- Guidelines for Automotive SPICE® Potential Analysis contain limitations for the rating in Automotive SPICE® Potential Analysis:
 - No rules for **rating dependencies** between processes
 - No rules for **rating dependencies between the BPs** within a process as BPs are defined as independent items and have less dependency aspects
 - **Not for all processes** rating rules are defined



Rating Rules in Automotive SPICE® Potential Analysis – Process Specific

ID	Process Name	RLs
POPM	Potential Project Management	5
RTCM	Release & Technical Configuration Management	1
PQAS	Process Quality Assurance	5
TEPR	Technical Problem Resolution	-
SYRD	System Requirements Analysis and Design	4
SYIV	System Integration and Verification	3
REEL	Requirements Elicitation	-
SWDI	Software Requirements, Design and Implementation	8
SWIV	Software Integration & Verification	3
PCOM	Partner and Collaboration Management	1
TCRM	Technical Change Request Management	1
CSGE	Cybersecurity Goal Elicitation	-
CSVV	Cybersecurity Verification and Validation	-

Feedback about POA - Facts

- POA is focusing only on **basic topics**, some of the areas that are normally essential during assessment e.g. resources, responsibilities, vertical traceability, ... are left out
- POA does make sense **to check for organization with whom we have never worked before**, however for suppliers that have a long history, the added value is doubtful.
 - Provides a flavor of the organization capability
- It is unclear whether the **purpose** „process improvement“ versus „Process-related product risk“ should be considered.
 - Due to the scope limitation, process-related product risk does not look feasible
- Due to low number of BPs, often combining several BPs from ASPICE 4.0, **the rating results may widely differ between assessors**, the rules as such are covering very specific points, not always that critical in the context of POA (Were partially copy paste from ASPICE 4.0 guidelines)

Feedback about POA - Drawbacks

- POA is supposed to **last two days**. This is very short to deeply understand what has happened on the project, respectively identifying weaknesses
 - Weaknesses can only be obvious
 - There is not much time to dig into a complete project which can be complex both in terms of size (Number of teams, geographical split) but also timeframe (many different releases)
 - In this case a suitable sampling shall be made to focus on the critical part of the project (Feature, team, release, ...)
- Mixed feeling about the **usefulness of POA**. A gap analysis is normally 4 to 5 days. A two day POA for all a similar scope (Management, Support, System, Software) is just too short
 - 45 min to cover SW requirements to code or all SW tests (Unit, integration, software)!!
- Since the POA is done on an “exemplary” project or Golden Sample, which is self chosen by the supplier, this **may not reflect the “real” organization capability** but the best implementation.

Personal Experience

- POA performed on a project that was already assessed formally
- However, assessment results were not completely satisfactory and according to RFC requirements, POA results shall be provided
- Many evidences could be reused from the assessment to gain time but also some findings remained true despite the reduced scope
- The findings that could affect the POA final results were checked on the latest releases (Beyond the assessment) to check improvements
 - Rating was improved
 - However, rating was yellow considering the full project
- My “Gut feeling” was that the POA was asked by Purchasing just to fulfill the process, ensuring a competent assessor has performed the job (even an internal competent assessor would have been accepted)

Recommendations

- Due to the limited timeframe of POA, **only experienced assessors** should perform POA since they normally know, where to investigate, below the surface, to identify issues
 - Otherwise only obvious findings will be identified only and there is a higher probability that “faked” evidences will be shown.
- Consider a continuous example from system requirements to source code, respectively test cases; Nevertheless, overview on the complete system / Software requirements modules and architecture is necessary.
- If the project is not well known by the assessment team or having a complex settings, **extend the interview time** compared to original proposed planning
- Read carefully the scope **of POA and limitations (Rationales)**. As experienced lead assessors, we tend to cover all topics, more specifically the most critical ones, that may out of scope of a POA

Use of VDA POA by OEM

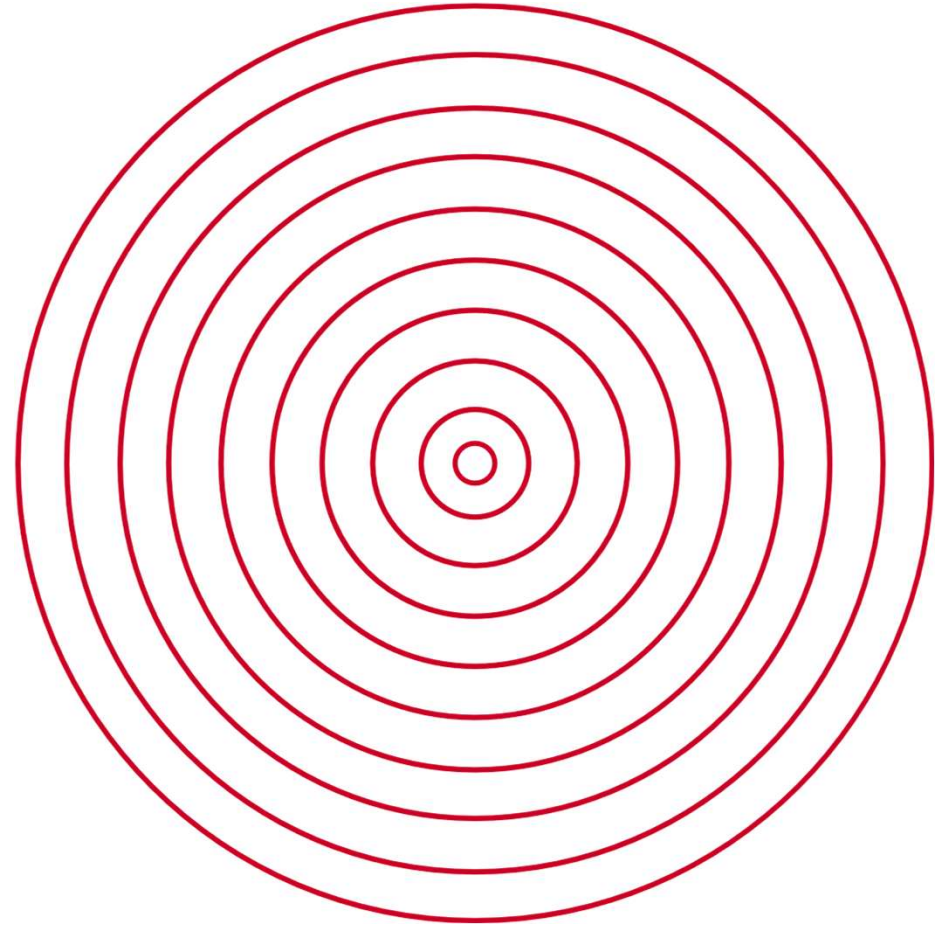
- Standardized POA is now used by VW Group
- Any feedback from other OEMs in the audience?



Conclusion

- POA may be used more and more by OEM as an entry point to RFQ
- Value is somehow doubtful:
 - Best sample not reflecting the real organizational capability
 - Can be performed internally and consequently „faked“
- Can be useful in certain context
 - Need for understanding the status of an ASPICE implementation in a short timeframe as
 - Preparation for final assessment
 - Regular process compliance check
- However, mind the reduced scope!!

Questions?



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