INTACS® CENTRAL AND EASTERN EUROPE REGIONAL EVENT

Driving Product Quality Through Robust Development Processes: An Automotive SPICE® Perspective

Agenda

1. Process Quality supports Product Quality
2. Automotive SPICE® Potential Analysis (PoA) during Awarding Phase
3. Supplier Expectation in regards of Automotive SPICE®
4. Maintenance of Standard Development Processes is a Key Element
5. Success factors for strong collaboration with Supplier Quality Engineers
6. Summary

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Process Quality supports Product Quality

What supports Product Quality?

Development Processes
Established & maintained
by the Organization (not Project)

Product platform & Re-use
Re-use of proven & released
Product Elements

Development Team
Clear roles & focus, availability,
technical & communication skills

Production
Early involvement and
regular synchronization

Specification & Architecture

- Intensive analysis of OEM specification & Supplementary documents
- Establish Functional Safety and Cybersecurity “by Design”
- Standards, Norms, Regulatory Requirements are under control
- Transferring Non-Functional expectations into Measurable Product Requirements

Process Quality supports Product Quality

How does Automotive SPICE® support Product Quality?

Automotive SPICE® is one of our leading preventive Quality Measure to ensure Product Quality for Software / Services and Software-intensive Systems e.g., ECU*'s

Focus lies on the "preventive nature" of Automotive SPICE® and defining Process Requirements:

- Product: Specification, Architecture, Development & Verification (SYS & SWE Processes)
- Project: Schedules, Activities, Milestones, Release Plan, Risks, Reviews, etc. (MAN & SUP Processes)
- Process: Development Approach & Standard Processes (Process Definition & Capability)

* ECU: Electronic Control Unit

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Automotive SPICE® Potential Analysis (PoA) during Awarding Phase

- Main usage during contract Awarding Phase for Supplier Selection
- Applicable for all types of software-based Systems incl. COTS*

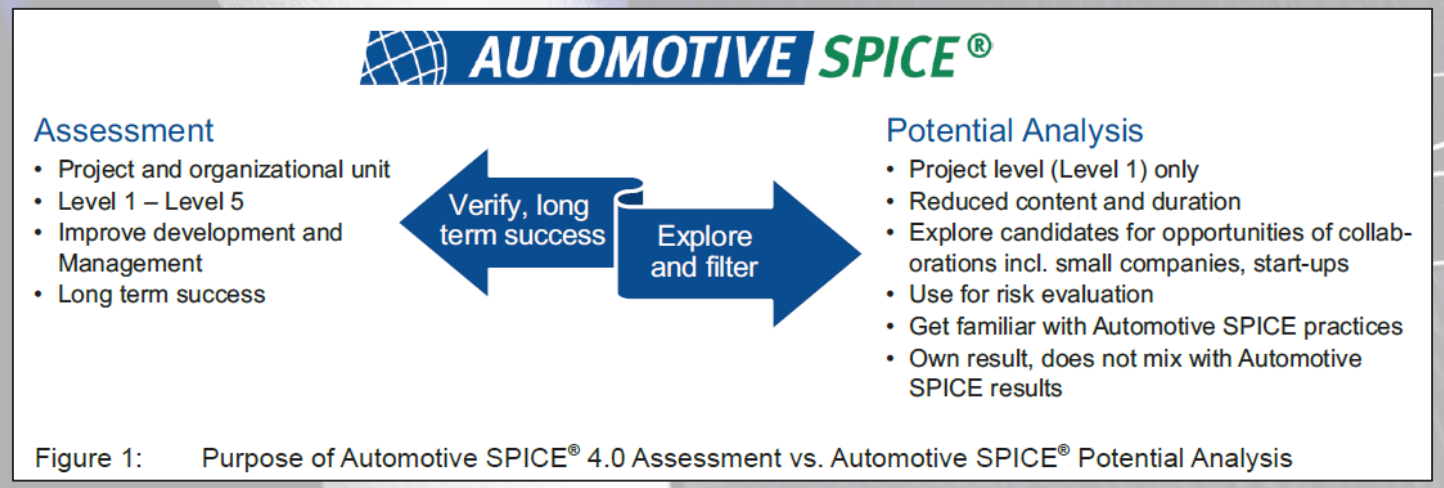
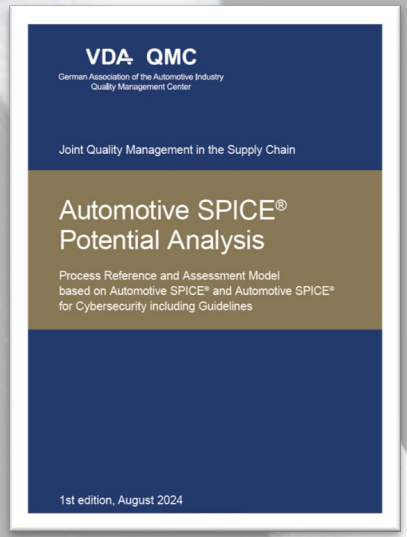


Figure 1: Purpose of Automotive SPICE® 4.0 Assessment vs. Automotive SPICE® Potential Analysis



Reduced content: ASPICE® PoA is performed on an Exemplary Project(s)

Limited usage: Results will not be shared with others than involved (MBAG and Potential Supplier)

Short validity: Results are valid for a limited time between Partners

* COTS: Commercial off the shelf

Brief Introduction to Automotive SPICE® Potential Analysis (PoA)

PoA Scoping: Basic & min. one Plug-in (& Optional/Flex if needed)

Basic		
	POPM	Potential Project Management
	RTCM	Release and Technical Configuration Management
	PQAS	Process Quality Assurance
	TEPR	Technical Problem Resolution

&

(min. one) Plug-in			
	RE	REEL	Requirements Elicitation
	System	SYRD	System Requirements Analysis and Design
		SYIV	System Integration and Verification
	Software	SWDI	Software Requirements, Design and Implementation
		SWIV	Software Integration and Verification

(&)

Optional / Flex		
	PCOM	Partner and Collaboration Management
	TCRM	Technical Change Request Management
	CSGE	Cybersecurity Goal Elicitation
	CSVV	Cybersecurity Verification and Validation

Process rating:

% of achievement	Rating color	Rating
0% to 50%	Red	Fragmentary
50% to 75%	Yellow	Valid
75% to 100%	Green	Satisfactory

› Scope can be adapted as needed & rating follows simple rules

Automotive SPICE® Potential Analysis (PoA) during Awarding Phase

Early focus on Process Quality supports Product Quality

Early insight in Development Process Quality during Awarding Phase by:

Providing the latest Automotive SPICE® Assessment Result
same product group, same development location, max. 12 months old, etc.

OR

Performing an Automotive SPICE® Potential Analysis before Awarding by Mercedes-Benz Supplier Quality
Results are used after Awarding as a starting point for Process Improvement and scheduling the Automotive SPICE® Assessment

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Supplier Expectation in regards of Automotive SPICE®

Additional documents support to understand Mercedes-Benz expectation

Mercedes-Benz Supplier Quality applies Automotive SPICE® to all Software-intensive Systems based on:

Automotive SPICE®
PRM/PAM Version 4.0

VDA® QMC® Automotive
SPICE® Guidelines

+

Mercedes-Benz
Special Terms Software
(MBST-SW - ALD00002217*)

Mercedes-Benz
Automotive SPICE®
Assessment Guideline
(MGU00001876*)

Expectation:
Usage of MBST-SW and “Mercedes-Benz Automotive SPICE® Assessment Guideline” for Scoping and Assessment preparation & confirmed by Supplier Quality Engineer

- 1st Project:
  - Level 2 to be reached in all Processes of the Scope
  - Working on Level 3 Processes in parallel (Requirement for the next Awarding)
- 2nd Project and following:
  - Level 3 to be reached in all Processes of the Scope
  - Project Processes derived from Level 3 Processes (Deployed Process)

* Access for all partners via “Mercedes-Benz DocMaster system”

Supplier Expectation in regards of Automotive SPICE®

Why is Automotive SPICE® Level 3 in focus for Mercedes-Benz?

- Standardization of Development Processes and Continuous Improvement established in the Organization (not only in Projects)
- Early focus on Quality and Qualification (in Development Processes)
- Foundation for Safety and/or Security relevant Products
- Enables a systematic Integration of new Technologies and Approaches e.g., AI, SDV, Agile
- Supports Long-term Partnership & Product Quality

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Maintenance of Standard Development Processes is a Key Element

Establish Standard Development Processes on Supplier Organization Level

- Standard Development Processes needs to be established on Supplier Organization Level with dedicated Experts
- Regular Communication with “Customer Projects” is mandatory to ensure Feedback Loops
- Always observe new and updated:
  - Mercedes-Benz Standards (e.g., MBST, MBN, MSS, MGU)
  - National & International Norms, Standards and Frameworks (e.g., ISO, IEEE, UN-ECE related national norms), and
  - Regulatory Requirements e.g., EU Vehicle Type Approval (Europe), FMVSS (US), CCC, GB, GB-T (China), …

Standard Development Processes:

- Process Landscape (Sequence & Tailoring)
- Detailed (Company-specific) Method Descriptions
- Supportive Templates & Checklists
- Development Tool-Support
- Clear Roles and Responsibilities
- Glossary / Terminology Guide
- Available Trainings for Processes/Methods/Tools (not ASPICE!)

Current Challenges:

- Communication between:
  - Process Owners and Supplier Projects
  - Supplier Project and MBAG Counterparts
- Integration of new Technologies into Process Landscape e.g., AI / Machine Learning
- Process Tailoring for “Collaborative Development Projects” (e.g., SW Development using MBAG Development Approach, Tools and Infrastructure)

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Success factors for strong collaboration with Supplier Quality Engineers

View on Mercedes-Benz internal qualification program (Focus: Automotive SPICE®)

- Intensive internal Qualification Program for Supplier Quality Engineers in new Technologies, preventive and analytical quality measures e.g., Automotive SPICE®, VDA® 6.3, Quality Methods
- 120+ active Assessors for internal Assessments (Inhouse Development) and coordinating Supplier Assessments (by Supplier Quality Engineers)
- Quarterly Knowledge Exchange between Assessor on current topics
- Feedback from Assessment Teams and Supplier Visits to refine our Mercedes-Benz Automotive SPICE® Assessment Guideline
- Multiplier Role established in all Development and Quality Departments
- Mercedes-Benz is an official VDA® QMC® approved Training Provider for Automotive SPICE® since 2022 offering internal Qualifications on all Levels: Process Expert – Provisional – Competent – selected Extensions e.g., Potential Analysis

Mercedes-Benz acts as an internal ASPICE® Training Provider

Why is it important to train Mercedes-Benz Assessors internally?

MBAG internal usage
Combining Standard Method with MBAG internal Approach

Supplier Landscapes
Understanding Development Approaches and Terminology

Real Examples
Using real Project Examples accelerates the Learning Curve

From Colleague to Colleague
Well known Terminology support fast Learning Results

Knowledge Exchange
Share Experience in Technologies or Development Approaches e.g., Agile, Model-based Development, AI

Building Networks
Establish a personal Network for professional Support

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- Maintained Supplier Development Processes build the Foundation for Product Quality in Projects
- Communication and Collaboration is the Key to understand the Product and Quality Expectations
- Continuous Qualification programs ensure Long-term Partnership and high-end Product Quality

THANK YOU!