ASPICE

ISO 26262, the functional safety standard for vehicles broadly adopted worldwide, incorporates extensive safety analysis methods that account for random errors. But ISO 26262 largely fails to account for systematic errors, including software flaws. ASPICE, or Automotive SPICE, is the most current standard for automotive software best practices, but it is yet to be globally adopted.

WHAT IS ASPICE?

is a framework for software process assessment developed by the ISO. Its purpose is to evaluate development factors that allow assessors to determine an organization's capacity for effectively and reliably delivering software products. Fundamentally, ASPICE defines best practices for embedded software in automotive development. It allows teams to organize their projects and approaches to ensure manageability, reliability, and deliverables. To ensure effective safety practices, automotive suppliers should incorporate both ASPICE and ISO 26262 guidelines. Without adhering to both, you open yourself up to various risks and potential failures.

All about ASPICE: goals, requirements, and levels

ASPICE builds on the V-Model, also known as the Verification and Validation model, which requires a testing phase corresponding to each stage of development.

The initial phases, or the left side of the V, include:

- Requirement Analysis, or ascertaining and organizing your client's requirements.

- System Design, or mapping your client's and stakeholders' needs to restructure them into a viable work process.

- Architecture Design, or organizing these requirements into logical operations encapsulating hardware, software, and communication.

- Module Design, or the creation of software requirements to match the system requirements and the development of service units.

- Coding, the point of the V, wherein the design and implementation of the units take place.

The secondary phases, or the right side of the V, include:

- Unit Testing, or ascertaining if the code matches the design and if basic standards and requirements have been met.

- Integration Testing, or the evaluation of software architecture and whether the service units are still functional.

- System Testing, or integrating all of the services into the full system and testing for functionality and requirement achievement.

- Acceptance Testing, or the final tests performed by the client.

Each of these points includes a corresponding testing phase, plus additional traceability and management processes. The ASPICE standard is scored from 0-5, with definitions as follows:

Level 0: Basic. You can at most "partially" achieve ASPICE requirements and should focus more on managing basic tasks than meeting higher standards.

- Level 1: Performed. You can either nearly or entirely deliver the standard requirements but may have gaps in your process.

- Level 2: Managed. You can reliably deliver the work products and nearly or entirely achieve the ASPICE standards in addition to the work products.

- Level 3: Established. You have established and set the performance standards for the organization and continuously evaluate and learn from them.

- Level 4: Predictable. In addition to having established and met performance standards, you measure, record, and analyze outcomes to enable objective evaluation.

- Level 5: Innovating. You achieve and analyze performance standards to obtain quantitative feedback and causal analysis resolution and invest in continuous improvement.

ASPICE Level 2, and Level 3 is the universal standard for excellence. Levels 4 and 5 are aspirational achievements usually attempted by massive corporations. You don't need to fear ASPICE, but rather treat it as a guideline to help you improve your production processes and become a more efficient automotive supplier.

How ASPICE affects automotive development

Organizations can only learn by attempting to improve their standards. Without a standard for achievement, it would be challenging to determine structured goals within the industry. ASPICE standards provide a benchmark for suppliers to ensure the stability of their processes and products, leading to an overall improvement in an industry where any mistake could cost you dearly.

ASPICE standards also have the potential to reduce labor time and costs by integrating the testing process throughout production, limiting dangerous missteps and reducing product recalls.

ASPICE ABCs: How to ensure compliance

Assess your current level of ASPICE compliance. Draw up a draft of your existing processes to visualize how they fit into the ASPICE V-Model.

Introduce the missing steps. If you lack a clear differentiation between two phases, create a plan to separate those two steps.

- Include stakeholders and team members. Ensure awareness of the reasons for and guidelines of ASPICE standards. This will

help you to allocate the resources to begin operating under the new best practices.

•Incorporate a testing phase at each step of production. This is the most important – and most challenging – phase of ASPICE compliance. Take the time to build a rigorous testing phase into each step of your new process.

•Begin operating under your newly established ASPICE-compliant processes. Once you have drawn up the plan, informed your team and allocated the resources – get to work!