Achieving value in weeks: Accelerating process adoption with Frameworks

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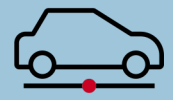
Collaborative Framework Development

stages

The **Automotive Process Framework (APF)** 

is developed **with and for customers**

to **significantly reduce** the **time** and **cost**

to **define** and **use**

an **automotive standards-compliant**

Product Development Processes (PDP)

in **Stages …**

stages

Frameworks

are developed **with and for customers and consultants**

to **significantly reduce** the **time** and **cost**

to **define** and **use**

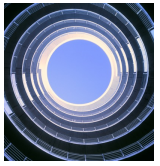
standards-compliant PDP

for **Critical Software Intensive Systems**

in **Stages**

Frameworks affect everything we do!

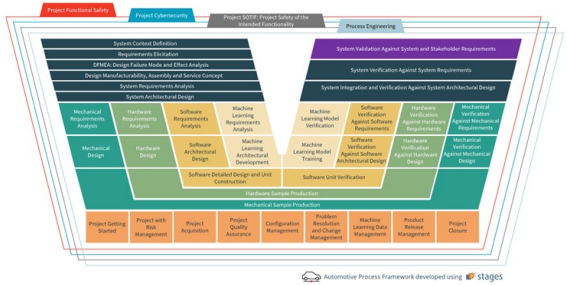
stages features
e.g. assemblies, lifecycle visualization, quality levels and process interface management



Enhance process architecture and modelling best practices

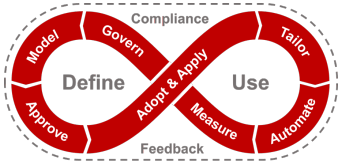
Develop consultants
to be better process modellers with a deeper understanding of automotive processes and standards

Unicon Metamodel
e.g. quality levels, assemblies, lifecycles and RASIC



Standard development
to enhance the standards, we support e.g. ASPICE 4.0 and Agile SPICE 1.4.1

Drive Process Improvement best practice



Used to support PoCs, training and workshops

We believe the APF helps customers define and use the processes they build on top of it faster, easier, and at lower cost

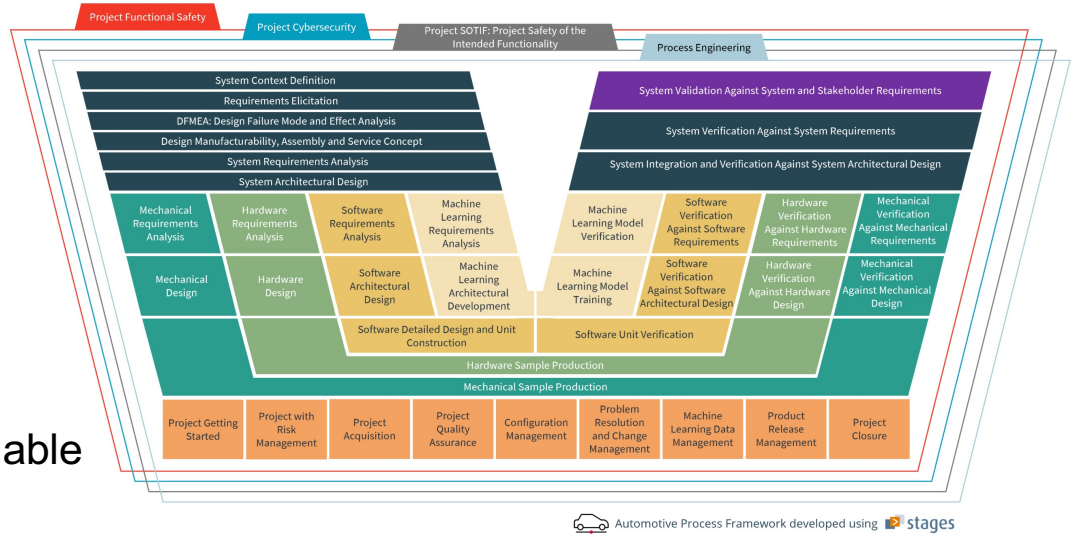
What's New in the Automotive Process Framework (APF) V8.0.0

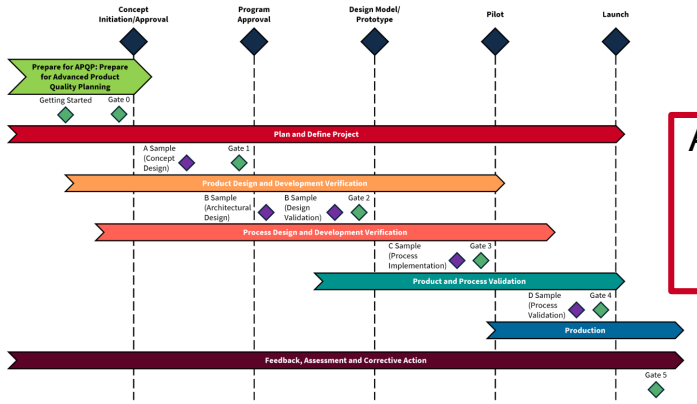
Creating processes from scratch is very time-consuming

The APF significantly accelerates process definition, enabling earlier adoption through:

- **A ready-to-use, “pre-argued” foundation:** Built on the combined expertise of UL Solutions experts and the legacy of kVA, Method Park, and KMC
- **A cohesive process architecture:** Easily extendable to meet the specific needs of your organization
- **Integrated processes:** Designed to support multiple overlapping, often inconsistent, and sometimes contradictory standards

What additional content would be helpful to accelerate your process definition and use?





APF V8.0.0 released end of Q3 2025

APF V8.0.0 highlights

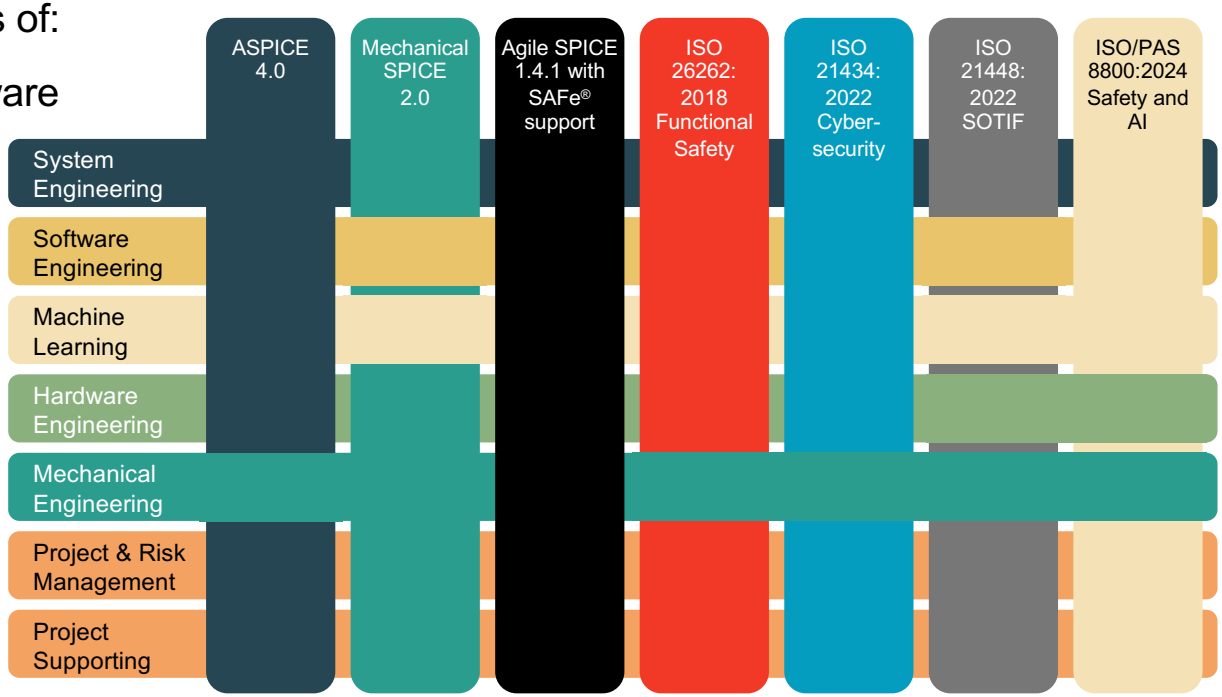
- New **ASPICE Machine Leaning Process Group** integrated with Software Engineering, SAFe®, Project Functional Safety and Safety of the Intended Functionality (SOTIF). Compliant with **ISO/PAS 8800:2024 Road vehicles – Safety and artificial intelligence**
- **Enhanced Project Cybersecurity, Functional Safety and SOTIF** extensions more consistent with each other and more tightly integrated into other processes
- **SAFe® Solution Train** processes to support large programs or platform projects
- Refined approach to **RASIC** for activities making it explicit which roles are responsible for reviewing and approving work products
- Enhanced **Advanced Product Quality Planning (APQP) Product Development (PDP) Lifecycle** based upon the AIAG APQP Handbook Third Edition with explicit process and product quality levels
- Initial **Process Engineering (Manufacturing Engineering)** discipline fully integrated with the other disciplines and APQP PDP lifecycle

Plus numerous refinements driven by real customer and consultant feedback

Compliant with industry standards and frameworks

The APF V8.0.0 supports the project scopes of:

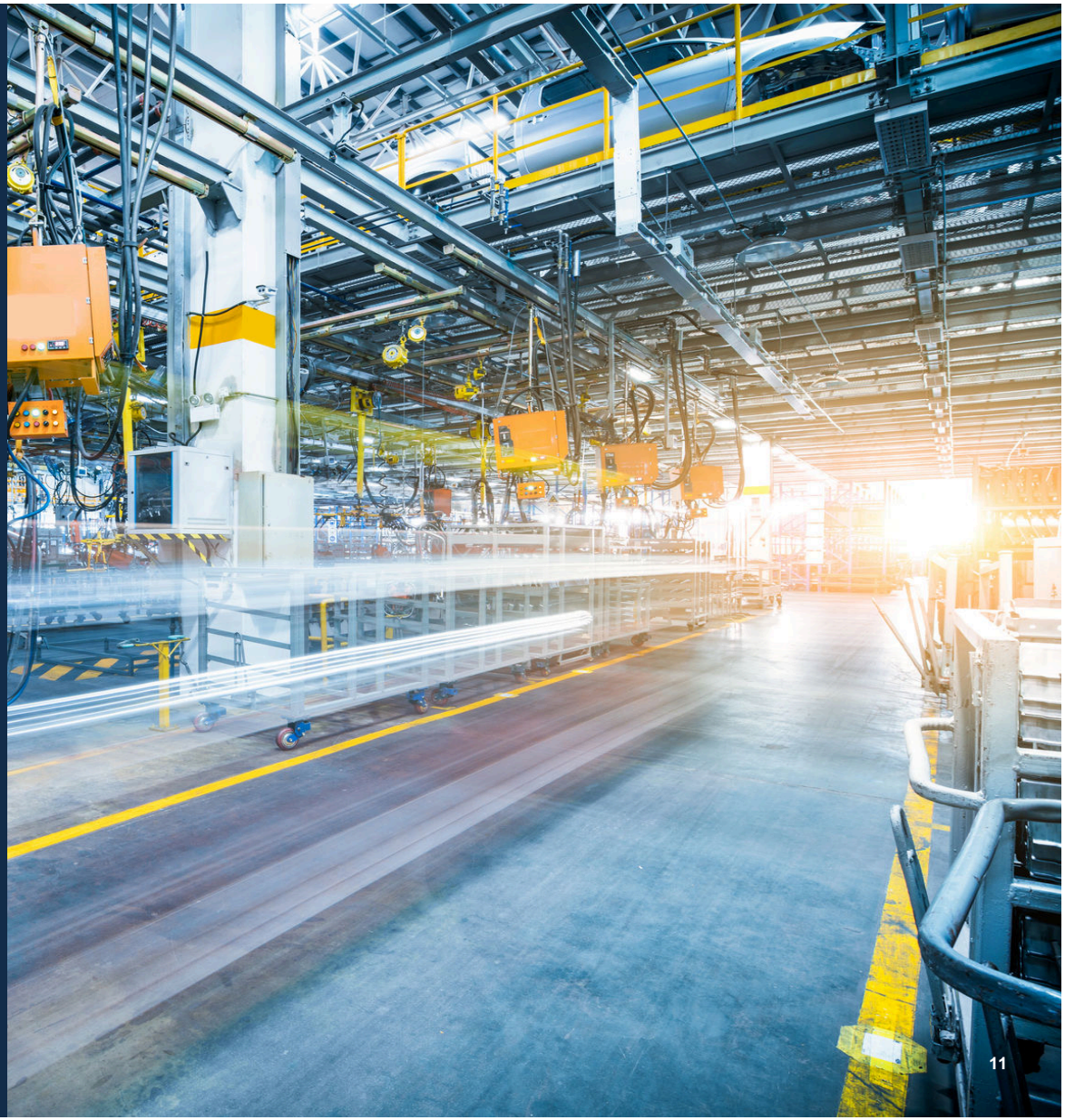
- Automotive SPICE® v4.0 (including Hardware SPICE®) **with new Machine Learning**
- Mechanical SPICE® v2.0 and **Agile SPICE v1.4.1**
- ISO/SAE 21434:2021 Road vehicles – Cybersecurity engineering
- ISO 26262:2018 Road vehicles – Functional safety
- ISO 21488:2022 Road vehicles – Safety of the intended functionality (SOTIF)



- **ISO/PAS 8800:2024 Road vehicles – Safety and artificial intelligence**
- Essential and **Solution Train** Scaled Agile Framework® (SAFe®).

Are there new or updated automotive standards you need to support?

Frameworks Roadmap



We believe the **APF** is an excellent foundation

for developing additional frameworks,

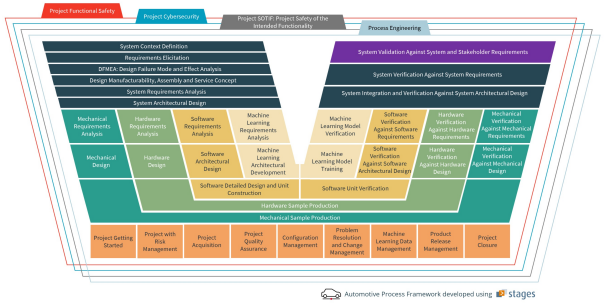
starting with the **Industrial Process Framework (IPF)**

and the **Defense Process Framework (DPF)**

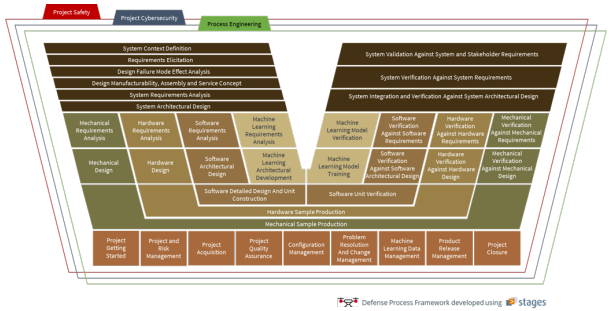
Frameworks to support adjacent industries

- We are planning to reuse and extend the APF content to support adjacent industries
- We will collaborate with several customers to develop each new framework to ensure we are developing what they need and appropriate industry-standard processes for other customer
- We will review the new frameworks with additional customers to ensure broad industry support

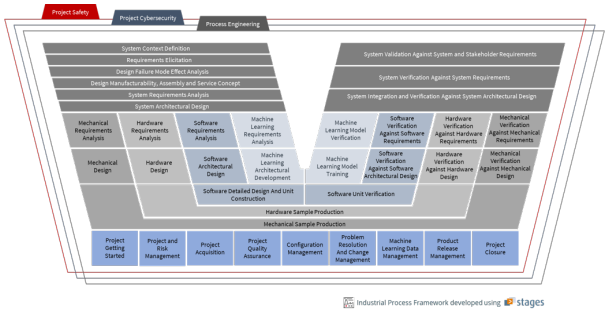
Are you interested in collaborating on or reviewing a new framework?



APF V8.0.0



Defense Process Frameworks (DPF) initially focusing on **Defense Vehicles & Systems**



Industrial Process Framework (IPF) initially focusing on the **EU Cyber Resilience Act (CRA)**

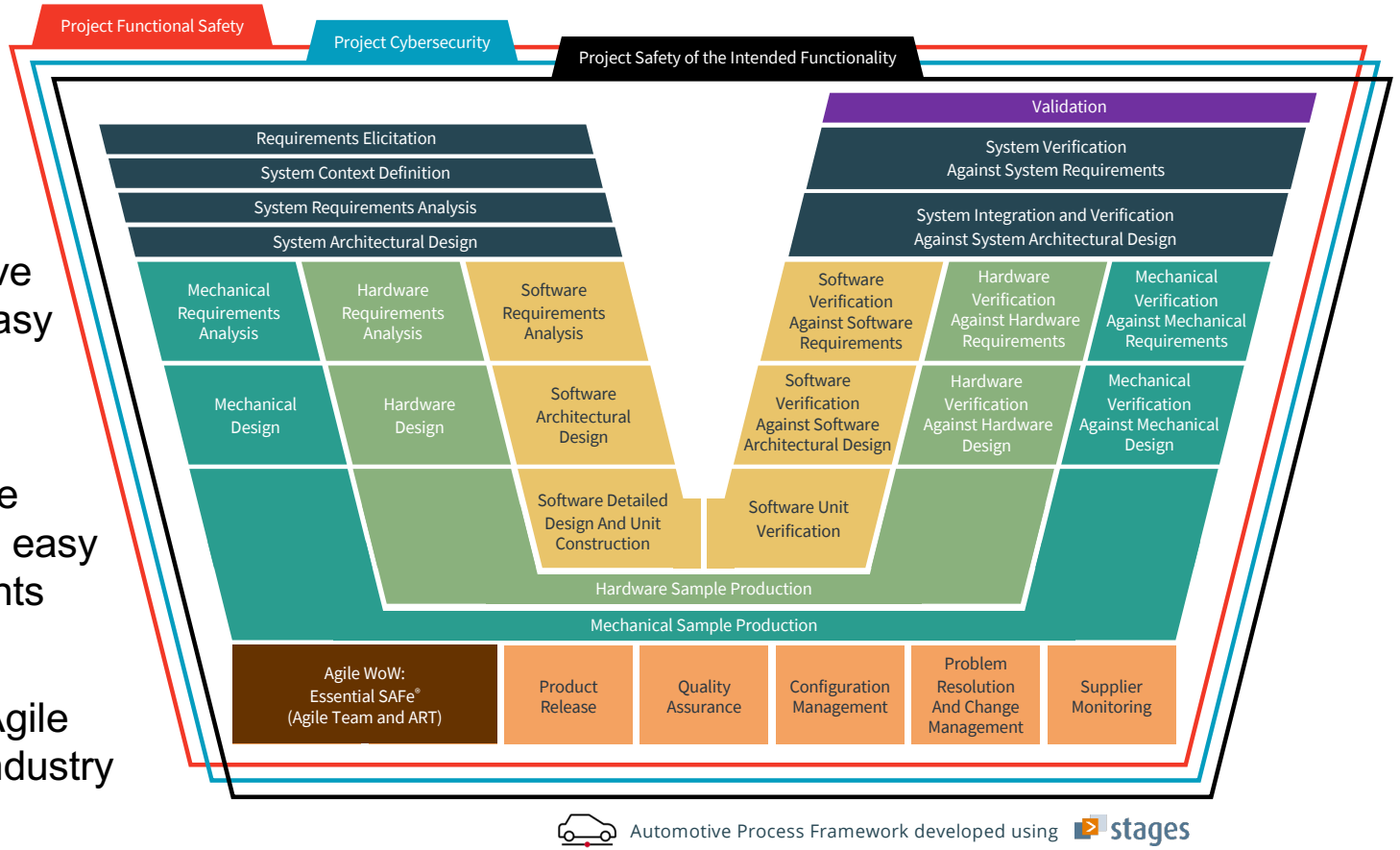
stages

The overall approach:

1. **Define the architecture and modeling strategy** needed to support multiple frameworks
   — **Done**
2. **Build collaborations with key customers** for each framework
   — **In progress**
3. **Create Reference Models** for core **Defense and Industrial standards**, map them to the APF, identify gaps, and close them
   — **Underway**
4. **Develop industry-specific lifecycles,** based on relevant standards
   — **Now being scoped**

Architectural strategy and initial analysis

- **Core disciplines** should have excellent cross-industry consistency **3% - 5% modification**
- **Optional disciplines** may have some industry variation, but easy to build variants as necessary **5% - 10% modification**
- **Extension disciplines** may be more industry specific, but are easy to build industry specific variants **20% - 30% modification**
- **Alternative disciplines** e.g. Agile ways-of-working are usually industry agnostic **0% modification**



Safety and Cybersecurity standards by industry

Industry	ISO 26262 / ISO 21448 / ISO 8800 / UL 4600*	ARP4761A / DO-178C / DO-254[2]	IEC 61508/ 62061	ISO 13849	ISO/SAE 21434	DO-326B[2]	ISA/IEC 62443	NIST CSF 2.0	ISO/IEC 2700X[1]	EU CRA
Automotive	✅	—	○	○	✅	—	◐	◐	◐	—
Aerospace & Defense	○	✅	◐	—	○	✅	◐	◐	✅	—
Industrial Automation	◐	—	✅	✅	○	—	✅	◐	◐	✅
General Manufacturing	◐	—	✅	✅	○	—	✅	◐	◐	✅
Consumer Electronics	—	—	—	—	◐	—	○	◐	✅	✅
Energy & Utilities	—	—	✅	—	○	—	✅	✅	◐	✅
Robotics	—	—	✅	✅	○	—	✅	◐	◐	✅
Marine / Autonomous Vessels	—	—	✅	—	○	—	✅	◐	◐	✅
Drones / UAVs	—	◐	○	—	◐	◐	○	◐	◐	✅

Legend: ✅ Primary fit · ◐ Frequent/with adaptation · ○ Limited/indirect · — Not typical

[1] Information Security highly related to Cybersecurity

[2] Defense aircraft/airworthness standards out of scope for initial DPF

*UL 4600, the Standard for Evaluation of Autonomous Products

Core standards for each framework

Automotive	Industrial	Defense Vehicles & Systems
• **Automotive SPICE® v4.0** • **Mechanical SPICE® v2.0** • **Agile SPICE® v1.4.1**	• **ISO/IEC/IEEE 15288:2023** System life cycle processes • **ISO/IEEE 12207:2017** Software life cycle processes	• **ISO/IEC/IEEE 15288:2023** System life cycle processes • **ISO/IEEE 12207:2017** Software life cycle processes
• **ISO/SAE 21434:2021** Road vehicles – Cybersecurity engineering	• **European Union Cyber Resilience Act (EU CRA)** • **ISA/IEC 62443** series of standards that address security for operational technology in automation and control systems	• **ISO/SAE 21434:2021** Road vehicles – Cybersecurity engineering • **ISA/IEC 62443** series of standards that address security for operational technology in automation and control systems
• **ISO 26262:2018** Road vehicles – Functional safety • **ISO 21488:2022** Road vehicles – Safety of the intended functionality (SOTIF)	• **ISO 26262:2018** Road vehicles – Functional safety • **IEC 61508:2010** Functional safety of electrical/electronic/programmable electronic safety-related systems • **IEC 62061:2017** Safety of machinery: Functional safety of electrical, electronic and programmable electronic control systems	• **ISO 26262:2018** Road vehicles – Functional safety • **IEC 61508:2010** Functional safety of electrical/electronic/programmable electronic safety-related systems • **IEC 62061:2017** Safety of machinery: Functional safety of electrical, electronic and programmable electronic control systems

Value in Action

Pass a CL1 Gap Assessment in weeks*

Week 1

Stages and APF Kick-Off

- Align on project and product scope
- Present Stages and APF from a project-usage perspective
- Instantiate and tailor the APF out-of-the-box → **Project version v0.5**
- Run the Work Products required report

Weeks 2&3

Discipline Walkthroughs and Tailoring

- Make minor updates to Roles, Work Products, and Workflows as necessary for the project
- Help discipline teams understand their responsibilities through walkthroughs
- Link each discipline's Work Products to Stages and close gaps → **Project version v1.0**

Weeks 4&5

CL1 Gap Assessment Preparation

- Use the instantiated, tailored, versioned project process in Stages during prep to support
- Conduct deep-dives with each process team
- Run mock assessments for each process
- Provide targeted feedback and close identified issues

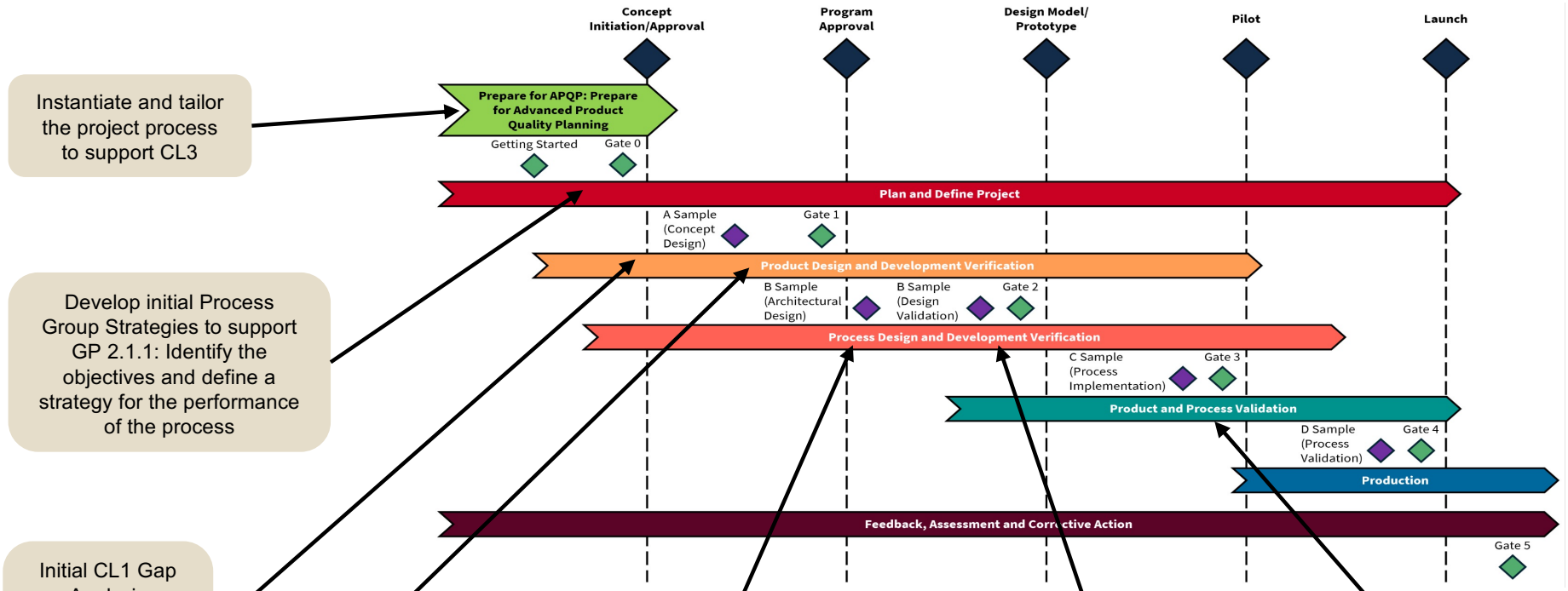
Outcome

Pass an independent ASPICE VDA-scope Gap Analysis!

six weeks

***It may take time for Work Products to mature before they as suitable to support a CL1 Gap Analysis**

Build gap analyses and assessments into the lifecycle



Instantiate and tailor the project process to support CL3

Develop initial Process Group Strategies to support GP 2.1.1: Identify the objectives and define a strategy for the performance of the process

Initial CL1 Gap Analysis focusing on core processes e.g. MAN, SUP and SYS

CL1 Assessment: Performed process

Initial CL2 Gap Analysis focusing on core processes e.g. MAN, SUP and SYS

CL2 Assessment: Performed process

CL3 Assessment: Established Processes

Iteratively & incrementally assess process adoption before critical contractual milestones

Key lesson learned

- **Most customers aim for “too good” processes up front and delay piloting:** start sooner
- **Focus on the ‘Why’ and the ‘What’:** standards-compliant processes that define what must be done, not detailed “How” guidance
- **Instantiate, tailor, and adjust a “good enough” process:** to fit the real needs of the pilot project

You don’t need a modelled process to achieve CL1 or CL2 —
but a ‘good enough’ instantiated, tailored process makes it far easier!

Call to Action

Call to Action

- **Act with urgency:** get “good enough” processes used by real project fast
- **Start immediately:** frameworks can used out-of-the-box on pilot projects
- **Verify adoption:** assess process use continuously across the project lifecycle
- **Deliver value:** adopt high-quality, compliant processes to deliver quality products

**Great processes build great products —
use them, and succeed faster!**

Thank you

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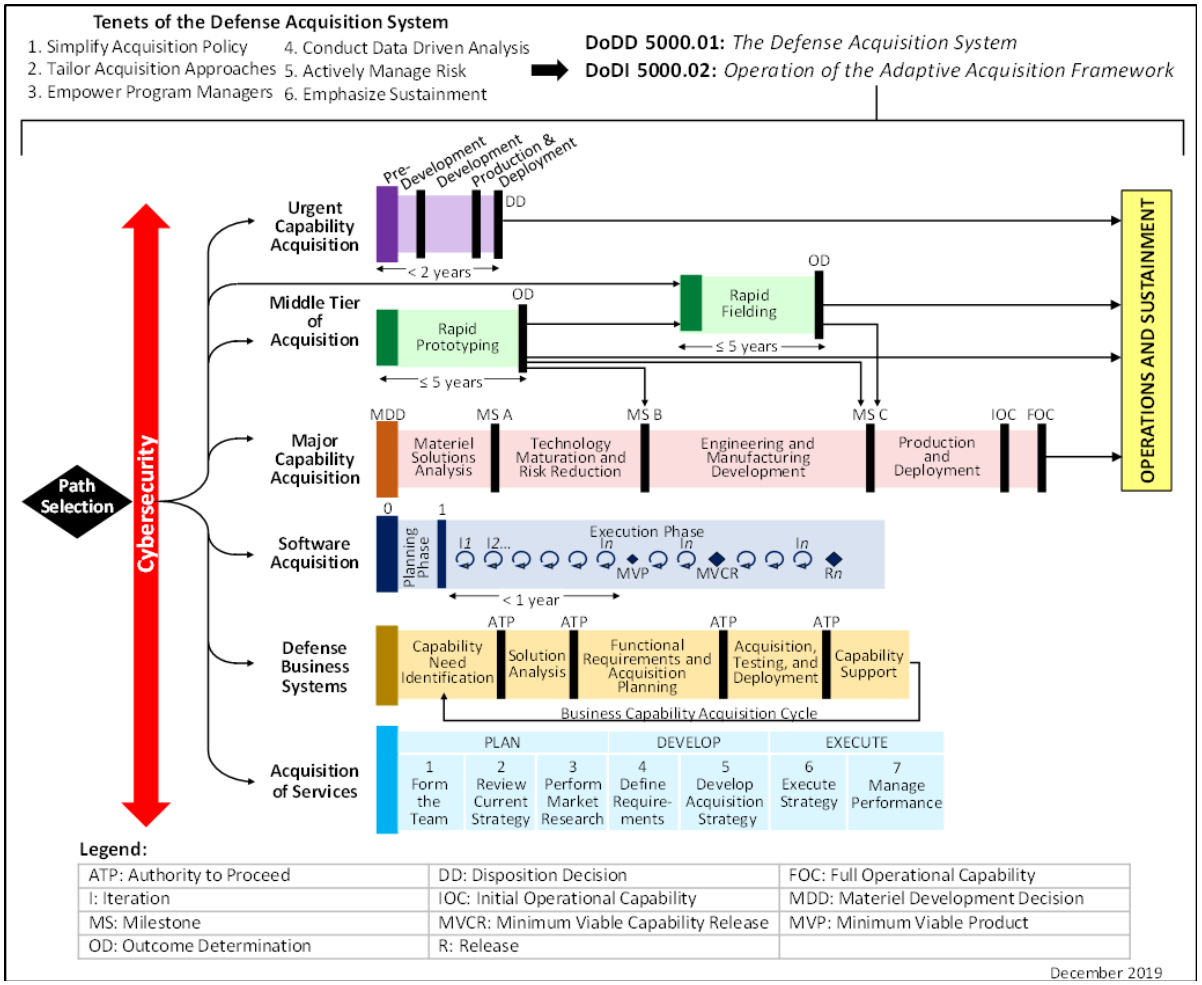
Lifecycle strategy

We will develop one or more Defense and Industrial specific lifecycles, for example:

Adaptive Acquisition Framework, Department of Defense, "DoD Instruction 5000.02: Operation of the Adaptive Framework", 2020.

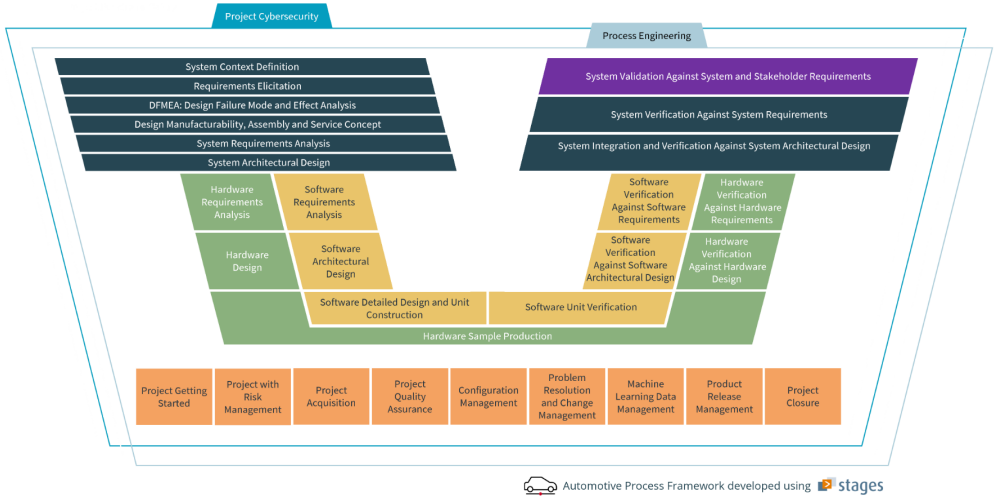
Are there any other specific Defense or Industrial lifecycles we should consider supporting?

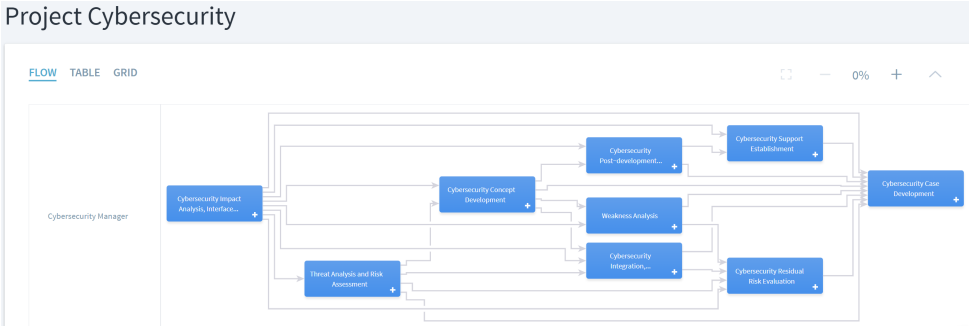


APF Fast START

Pre-packaged, read-only licensed access to APF processes designed to support a specific customer project with targeted focus areas e.g. Project Cybersecurity

- **Aligned process consultancy and training tailored** to the needs of your specific project
- **Integrated and aligned guidance** includes work product templates, checklists, and activity practices
- **Hosted in a Stages cloud environment** with full administrative support
- **Comprehensive coverage** including core management, supporting, and engineering processes that integrate with and support the focus areas
- **Project-specific tailoring** to meet your specific needs





We need to enable Sales (CP) build pipeline (Sales), and enable and support Process Consultancy to deliver (CP and PC)