Presented by LHP Engineering Solutions

ISO 26262 & ASPICE

A Powerful Combination

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YOUR HOST

Daniel Stuart

YOUR Q&A TEAM

Victor Aguilar

Frank Chang

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WEBINAR DISCUSSION

- How ISO 26262 and ASPICE relate to automotive safety
- Why OEMs & suppliers should incorporate both ISO 26262 and ASPICE
- How ISO 26262 & ASPICE work together to complete a trustworthy solution

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21st CENTURY REQUIREMENTS

Automated Driving

- Built-in sensor & actuator technology
- Vehicle high performance computing systems

Connectivity

- 3rd party service integration
- Over-The-Air (OTA) updates

Driver Mobility

- Shared-mobility service and self-driving-taxis via app
- Personalized driver experience

Electrification

- New electronic technology creation
- Improvement of energy consumption through advanced software algorithms

Source: Automotive Electronic; HAWK; IEEE, McKinsey, TÜV NORD

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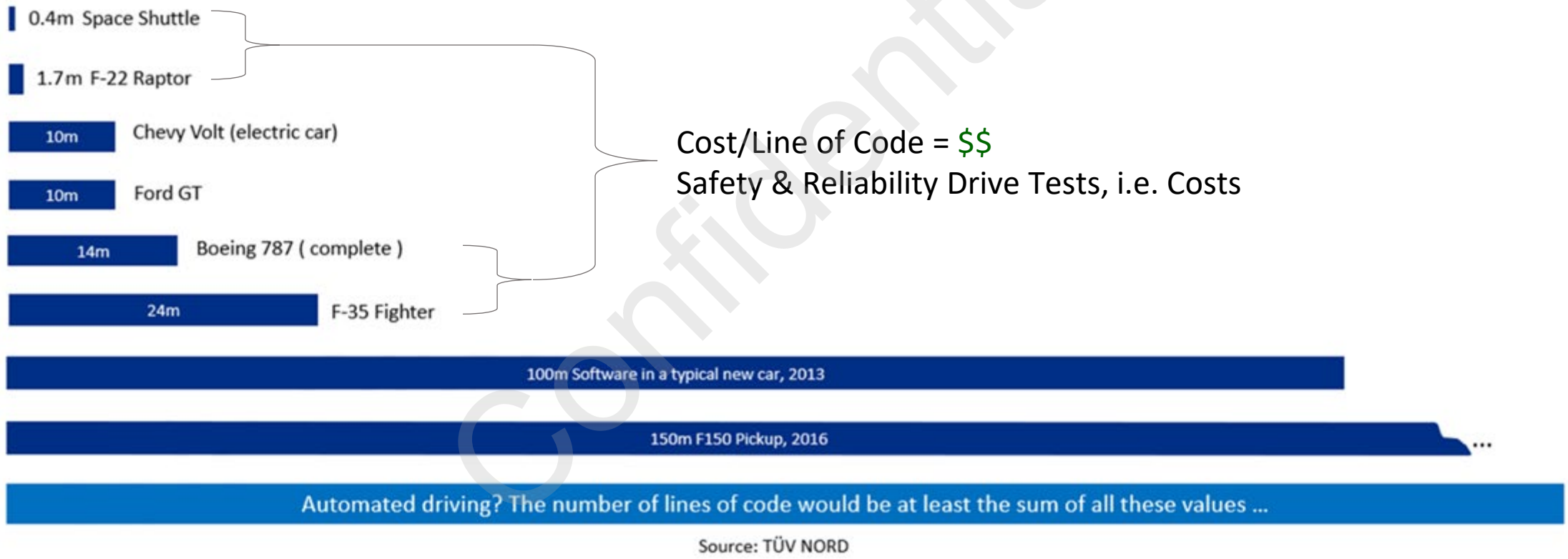
LINES OF CODE (IN MILLIONS)

…and growing!

- < 2013: 100-150 million
- 2013: 100 million
- 2016: 150 million



Source: TÜV NORD

Cost/Line of Code = $$
Safety & Reliability Drive Tests, i.e. Costs

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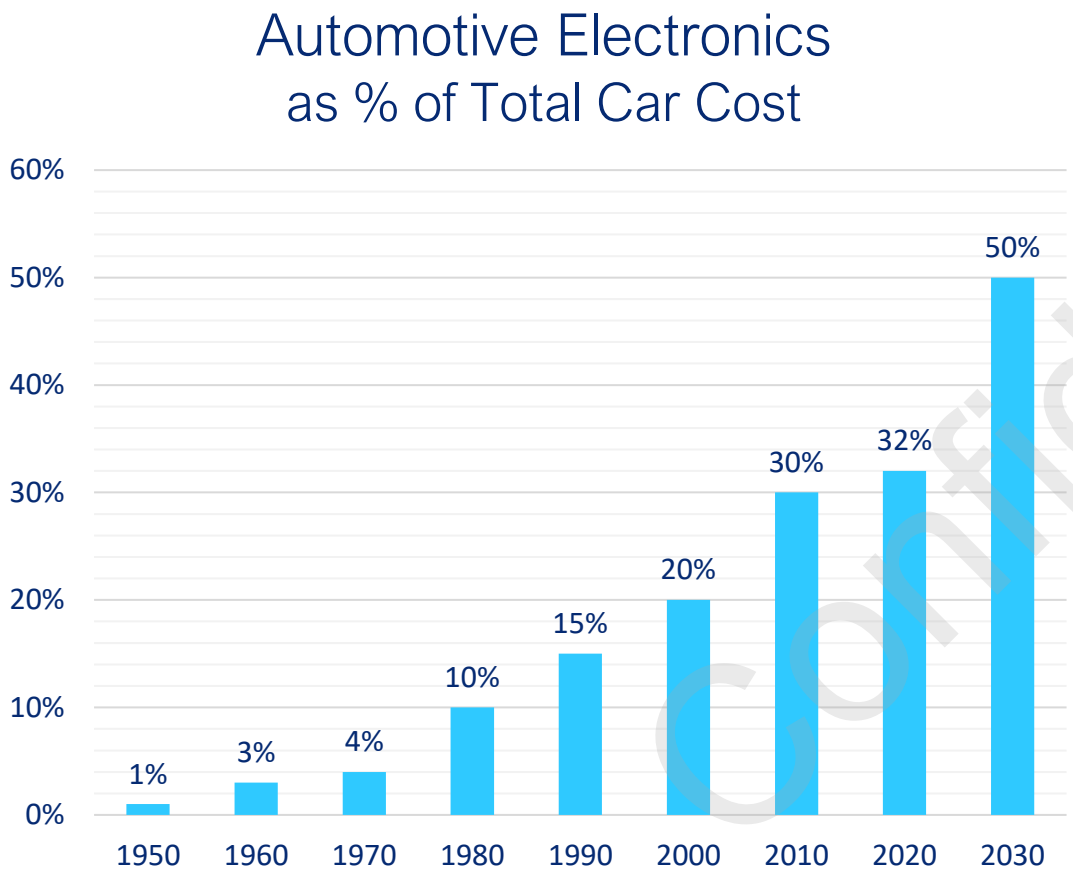
TODAY'S VEHICLE COSTS



https://www.slideshare.net/VisteonCorporation/xiv-congreso-internacional-2016

- Software controls 85% of a vehicle's functionality (automotivespice.com)
- Significant cost impacts, as vehicles rely more & more on software
- OEMs need a method to reduce costs, while assuring safety

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ROAD VEHICLES – FUNCTIONAL SAFETY

ISO 26262

Cause

- Increased risk of harm due to technological complexity and malfunctioning behavior i.e., increase in hardware/software reliance, such as the eV, fuel cell, and aV races

Effect

- Framework created as safety driver for automotive electrical and/or electronic (E/E) products
- Standard 'defines' expected organizational processes and work products throughout a product's lifecycle
    - E/E system safety criticality = identifies distinct level of rigor (4-levels, ASIL A–D+QM)

Result

- Protect human life with benefit to help protect the industry

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SOFTWARE PROCESS IMPROVEMENT & CAPABILITY DETERMINATION

Cause

- Software development like “the wild west”, open to individuality

Effect

- Adopt existing computer SW processes & adapt for automotive needs

- Standard ‘defines’ expected organizational processes and work products throughout a product’s lifecycle
    - SW process analysis = identifies distinct level of maturity (6-levels, Levels 0–5)

Result

- Industry gains consistent, reliable software, with benefit of mitigated ‘in field’ issues (i.e. safety incident prevention)
    - ASPICE does not directly address safety… although safety ‘reaps the benefit’

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WEBINAR DISCUSSION

How ISO 26262 and ASPICE relate to automotive safety

Why OEMs & suppliers should incorporate both ISO 26262 and ASPICE

How ISO 26262 & ASPICE work together to complete a trustworthy solution

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WHY ISO 26262 ?

- Validated safety
  - Safety standards the ‘watchdog’ for sophisticated E/E systems
- Reduced manufacturer liability
  - Implementation builds a case that due diligence was done -> evidence available to eliminate or minimize a financial impact
- Positioned for future regulations
  - ISO 26262 is the steppingstone to other standards, i.e. SOTIF
- Required implementation
  - Across the globe, most OEMs have adopted in some form or fashion, mandating it from their supply base

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WHY AUTOMOTIVE SPICE® ?

Structured consistency, with traceability

- The ASPICE framework utilizes & assesses your & your supplier's process capability

Increased efficiency

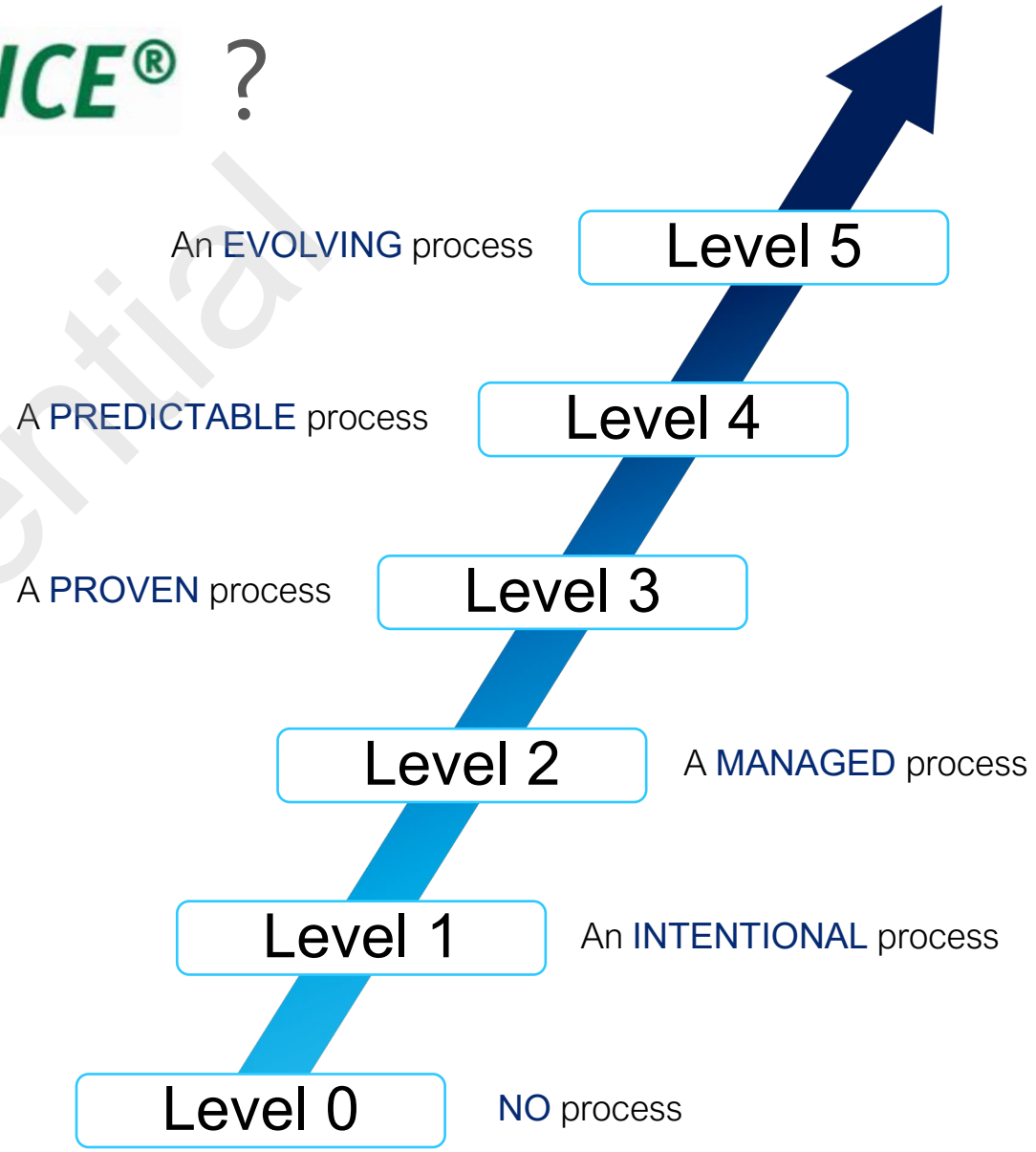
- Shortened release schedule & reduced iterations from errors

Reduced overall costs

- Lowered product development costs due to backend firefighting
- Decreased warranty/recall campaigns from undetected errors 'in field'

Required implementation

- Most European OEMs, along with an increasing number of US & Asian OEMs require ASPICE, targeting Level 3 (or Level 2 with a path to Level 3)



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WHY BOTH?

- ISO 26262 regards ASPICE as a trusted resource
  - ASPICE used 15x; references already in place

- Overlap in processes for systems & software
  - Supporting processes are similar
  - If implemented correctly, opportunity for a common set of WPs, which will cover both standards

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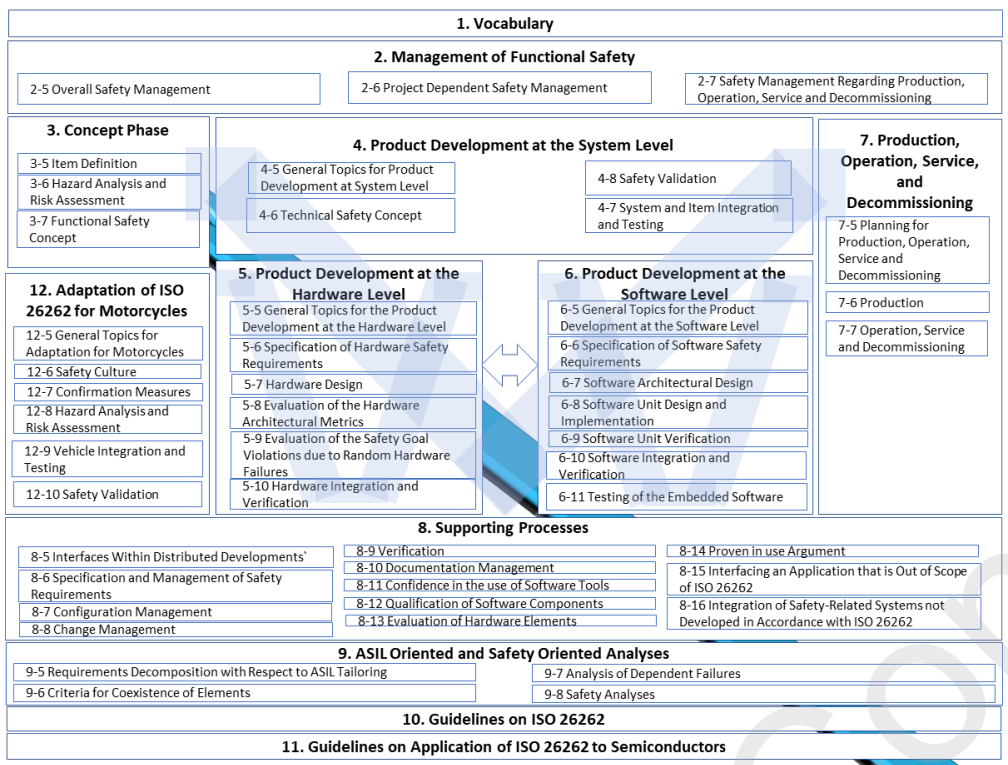
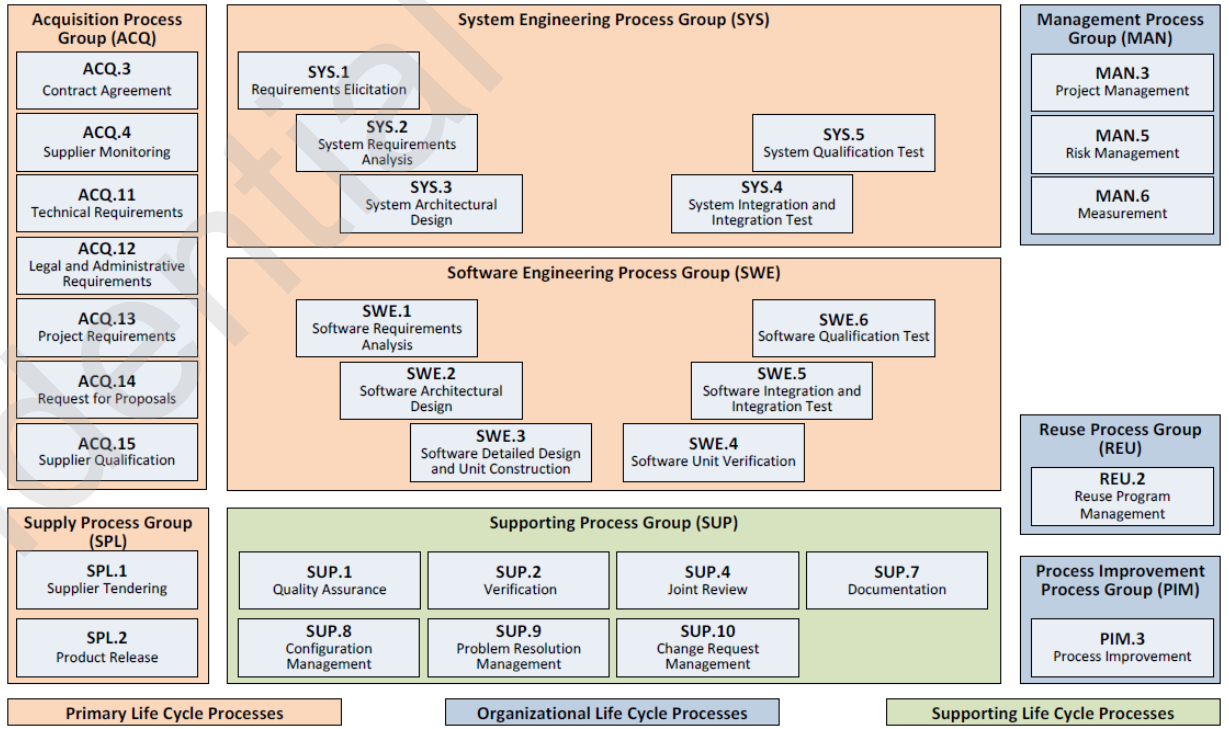
A CONVERGENCE OF STANDARDS





Both ISO 26262:2018 & ASPICE are complementary and work together as a complete solution

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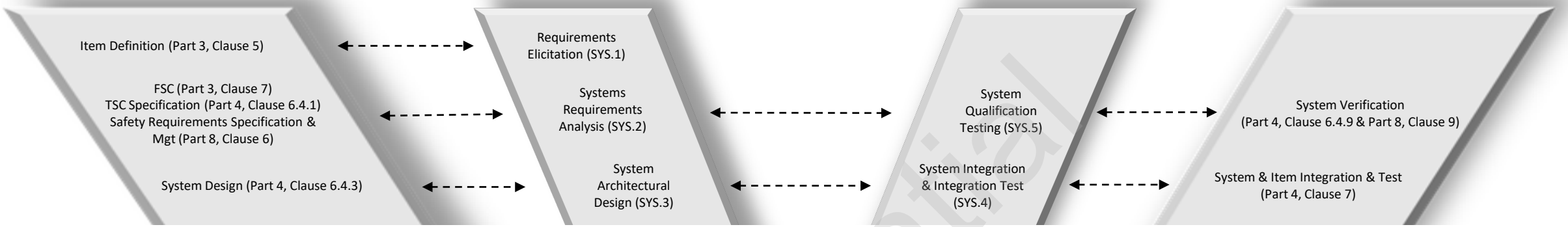

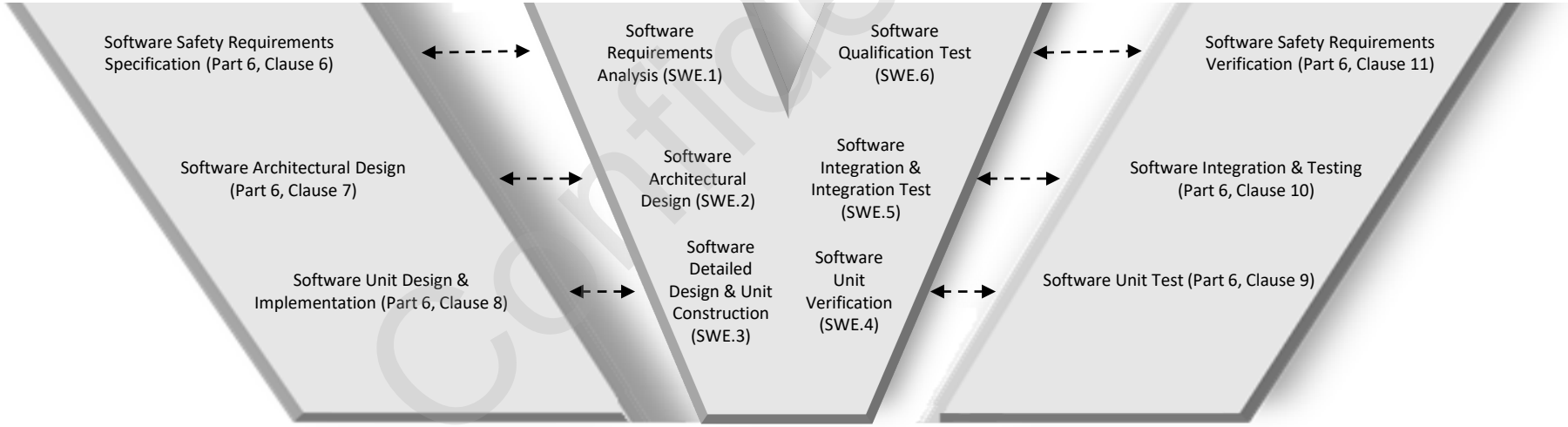

Management	Supporting Processes					Supplier
Project Mgt (MAN.3)	Quality Assurance (SUP.1)	Verification (SUP.2)	Documentation (SUP.7)	Configuration Mgt (SUP.8)	Change Mgt (SUP.8)	Supplier Monitoring (ACQ.4)
Safety Mgt; Item Definition; Safety Lifecycle; Initiation of product development at system, hardware, & software levels (Part 2, Clause 6 & Part 3, Clause 5)	Safety Mgt; Functional Safety Assessment (Part 2, Clause 5; Part 2, Clause 6; Part 2 Clause 6.4.12)	Verification (Part 8, Clause 9)	Documentation Mgt (Part 8, Clause 10)	Configuration Mgt (Part 8, Clause 7)	Change Mgt (Part 8, Clause 7)	Distributed Development (Part 8, Clause 5)

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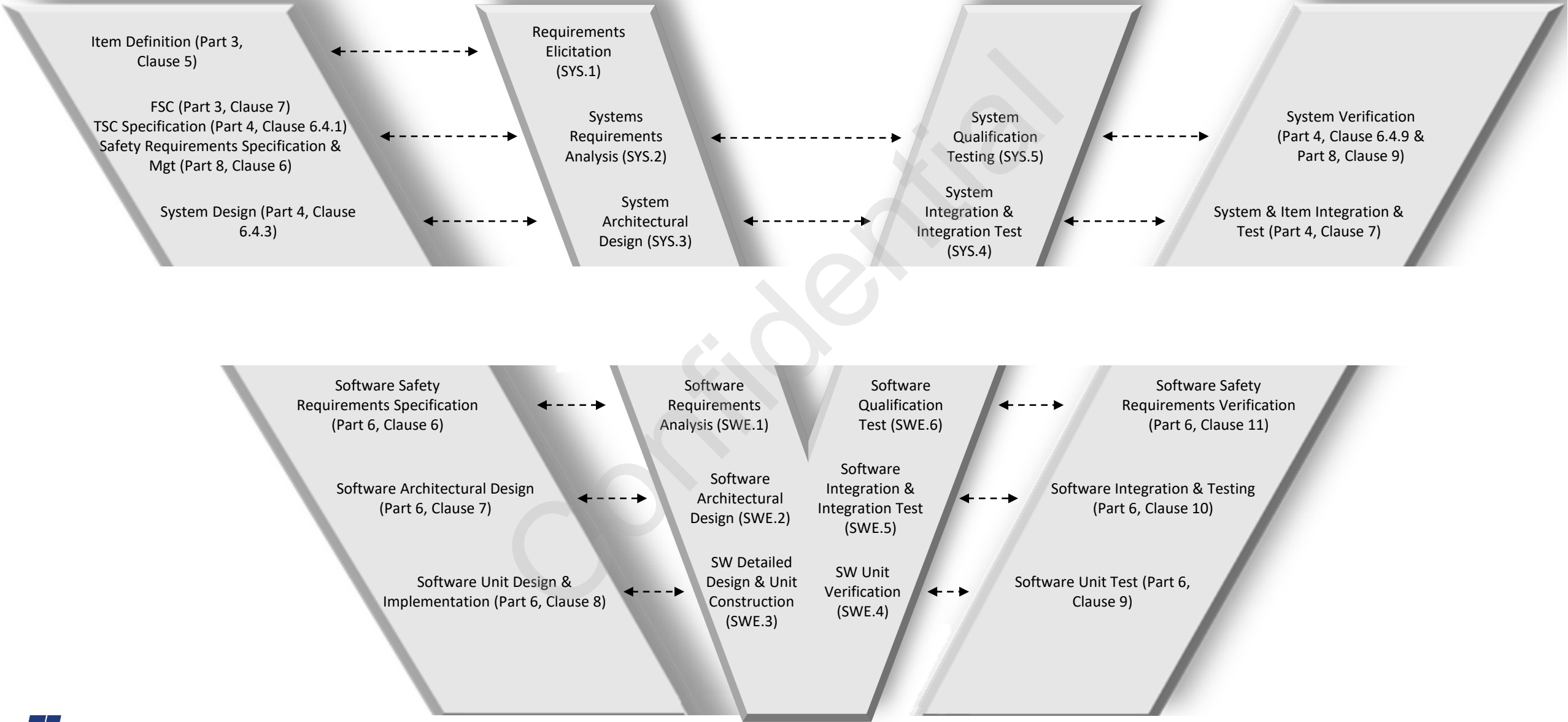

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SUPPORTING PROCESSES

	Management
AUTOMOTIVE SPICE®	Project Mgt (MAN.3)
ISO 26262	Safety Mgt; Item Definition; Safety Lifecycle; Initiation of product development at system, hardware, & software levels (Part 2, Clause 6 & Part 3, Clause 5)

	Supporting Processes				
AUTOMOTIVE SPICE®	Quality Assurance (SUP.1)	Verification (SUP.2)	Documentation (SUP.7)	Configuration Mgt (SUP.8)	Change Mgt (SUP.8)
ISO 26262	Safety Mgt; Functional Safety Assessment (Part 2, Clause 5; Part 2, Clause 6; Part 2 Clause 6.4.12)	Verification (Part 8, Clause 9)	Documentation Mgt (Part 8, Clause 10)	Configuration Mgt (Part 8, Clause 7)	Change Mgt (Part 8, Clause 7)

	Supplier
AUTOMOTIVE SPICE®	Supplier Monitoring (ACQ.4)
ISO 26262	Distributed Development (Part 8, Clause 5)

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BENEFITS

AUTOMOTIVE SPICE®

ISO 26262

- Proven standards to ensure process & product stability
- ‘State of the art’ technology equates to product development excellence
- Greater transparency through communication & review
- Issues addressed before product goes to market
- Continuous improvement from one can yield safer products for the other
- Significant ‘in-field’ cost reductions (warranty, recalls, & litigation)
- Wide-scale adoption would optimize the industry at a lightning pace

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A TOTAL SOLUTION

Combining both standards will lead to organizational:

- **Competency**
- **Consistency**
- **Compliance**
- **Certification** (if elected)

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The Smart Choice

NOW is the time to adopt both ISO 26262 & ASPICE

Given the rate of adoption, every automotive supplier will likely need to be compliant to supply product.

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NEXT STEPS TO COMPLIANCE

1. **Understanding** — LHP will ensure that you understand the phases and certification levels
2. **Assessment** — LHP will assess your current level of compliance
3. **Missing Steps Inserted** — Missing steps will be identified and inserted into your process
4. **Education** — Stakeholders and team members will be brought into the process and educated on the importance and their role in its implementation
5. **Testing** — At each step of production, a testing phase will be introduced
6. **Implementation** — Start using your new compliant processes

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QUESTIONS?

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Thank You

Lhpes.com/contact-us
Sales@lhpes.com
Sales Leader: Daniel.Yuhn@lhpes.com

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