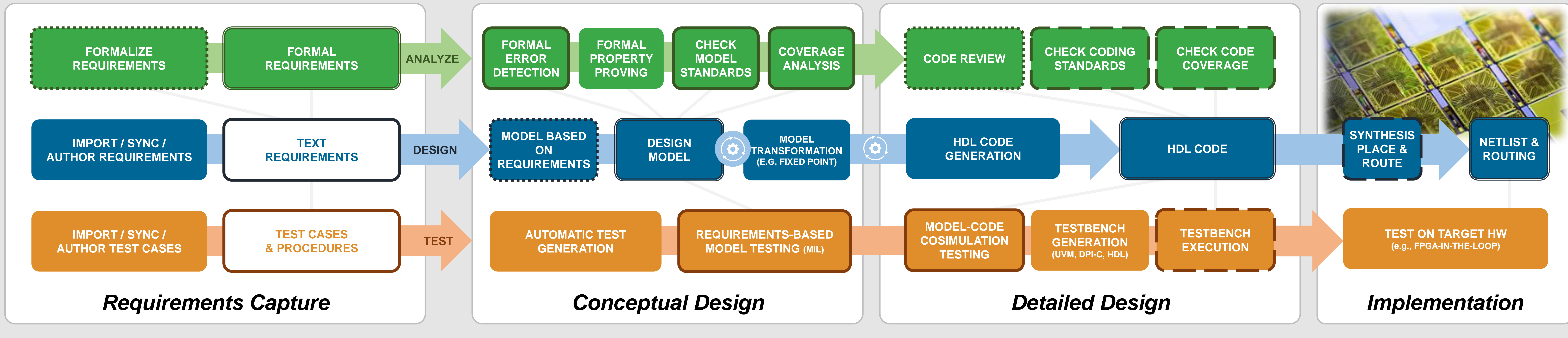


Design Assurance Guidance for Airborne Electronic Hardware

DO-254 MathWorks Support



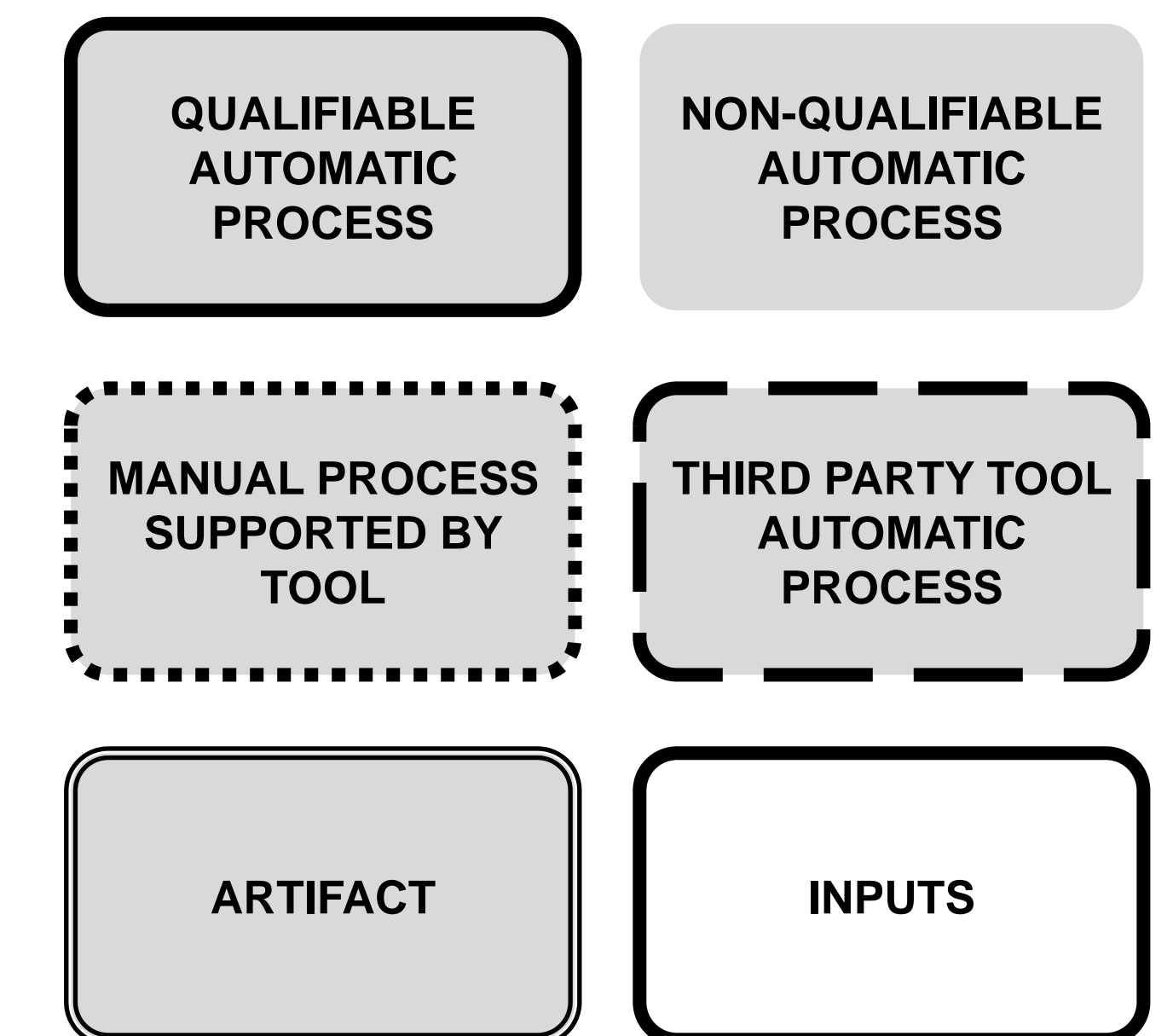
DO-254 Objectives

PLANNING PROCESS OBJECTIVES			
DO-254 SECTIONS	OBJECTIVE	DAL	MATHWORKS IMPACT
4.1(1)	Hardware design life cycle processes are defined	A, B, C, D	Model-Based Design is included as part of the design process
4.1(2)	Standards are selected and defined	A, B	Modelling and coding standards
4.1(3)	Hardware development and verification environments are selected or defined	A, B, C, D	Include Model-Based Design tools used in the lifecycle processes
4.1(4)	The means of compliance of the hardware design assurance objectives are proposed to the certification authorities	A, B, C, D	Define credit taken for Model-Based Design in relation to the objectives.

HARDWARE DESIGN PROCESS OBJECTIVES			
DO-254 SECTIONS	OBJECTIVE	DAL	MATHWORKS IMPACT
5.1.1(1)	Requirements are identified, defined and documented	A, B, C, D	Requirements authoring and traceability to artifacts
5.1.1(2)	Derived requirements produced are fed back to the appropriate process.	A, B, C, D	Requirements authoring and traceability to artifacts
5.1.1(3)	Requirement omissions and errors are provided to the appropriate process for resolution.	A, B, C, D	Requirements authoring and traceability to artifacts
5.2.1(1)	The hardware item conceptual design is developed and consistent with its requirements.	A, B	Conceptual design captured as a model and linked to requirements
5.2.1(2)	Derived requirements produced are fed back to the requirements capture or other appropriate process.	A, B	Model and requirements authoring
5.2.1(3)	Requirement omissions and errors are provided to the appropriate process for resolution.	A, B	Model and requirements authoring
5.3.1(1)	The detailed design is developed from the hardware item requirements and conceptual design data.	A, B, C, D	Code Generation from conceptual model and requirements traceability
5.3.1(2)	Derived requirements are fed back to the conceptual design or other appropriate process.	A, B, C, D	Code Generation from conceptual model and requirements traceability
5.3.1(3)	Requirement omissions and errors are provided to the appropriate process for resolution.	A, B, C, D	Code Generation, validation and verification

VERIFICATION AND VALIDATION PROCESS OBJECTIVES			
DO-254 SECTIONS	OBJECTIVE	DAL	MATHWORKS IMPACT
6.1.1(1)	Derived hardware requirements against which the hardware is to be verified are correct and complete.	A, B, C, D	Requirements authoring and traceability to artifacts
6.1.1(2)	Derived requirements are evaluated for impact on safety.	A, B, C, D	Requirements authoring and traceability to artifacts
6.1.1(3)	Omissions and errors are fed back to the appropriate processes for resolution	A, B, C, D	Requirements authoring and traceability to artifacts
6.2.1(1)	Evidence is provided that the hardware implementation meets the requirements	A, B, C, D	Requirements traceability Testing and test reusability, Coverage Analysis, Error Detection, Report Generation
6.2.1(2)	Traceability is established between hardware requirements, the implementation, and the verification procedures and results.	A, B, C	Requirements, test cases, results, conceptual model and code are fully connected

Block Legend



**DESIGN
ANALYZE
TEST**



Tool Qualification

DO-330 TOOL QUALIFICATION SUMMARY			
SW LEVEL	TOOL QUALIFICATION CRITERIA		
	1	2	3
A	TQL-1	TQL-4	TQL-5
B	TQL-2	TQL-4	TQL-5
C	TQL-3	TQL-5	TQL-5
D	TQL-4	TQL-5	TQL-5

TOOL CRITERIA DEFINITION:

- Development Tool whose output is part of the resulting SW and thus could insert and error
- Verification Tool that automates verification process(es) and this could fail to detect and error, and whose output is used to justify the elimination or reduction of:
 - Verification process(es) other than that automated by the tool, or
 - Development process(es) that could have an impact on the airborne (or NS/ATM) SW
- Verification Tool that automates verification process(es) and thus could fail to detect and error

DO QUALIFICATION KIT

Tools Requirements, User Manual and other MathWorks documentation Workflow Documentation and Tool Qualification Plans templates Verification Inputs Test Cases and Expected Result.

Automatic Report Generation

Simulation Results Report	Model Coverage Report	Model Standards Report
Model Design Error Report	System Design Description	HDL Code Generation Report
Coding Standards Report	Low-Level Test Cases	Test Reports

MODEL-BASED DESIGN WITH MATLAB & SIMULINK

