A Model-Based Systems Engineering (MBSE) Framework for Aerospace Applications

Presentation · September 2018

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Modelling and Simulation Tools for Systems Integration on Aircraft

MISSION

Clean Sky 2 – WP 100.3

Demonstration of the MISSION framework

Technology Readiness Level 5 – Towards workflow integration

Clean Sky 2

Clean Sky 2 MISSION – WP100.3 Scope

„modelling & simulation tools for systems integration on aircraft"

MISSION will provide a **software toolchain** supporting the whole aerospace product design workflow from **Requirements** to **Certification**

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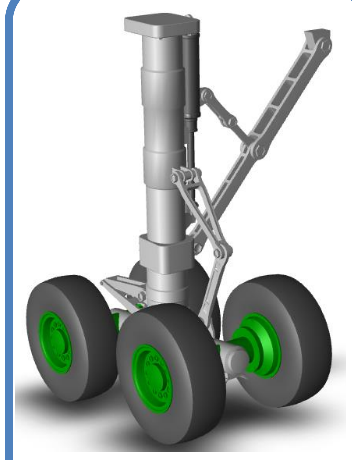
Open Framework integrating Design and Verification

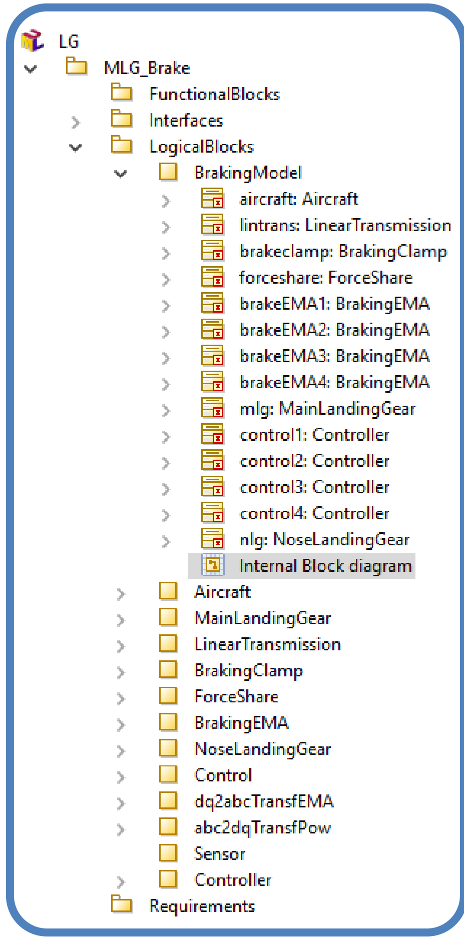
From Requirements…

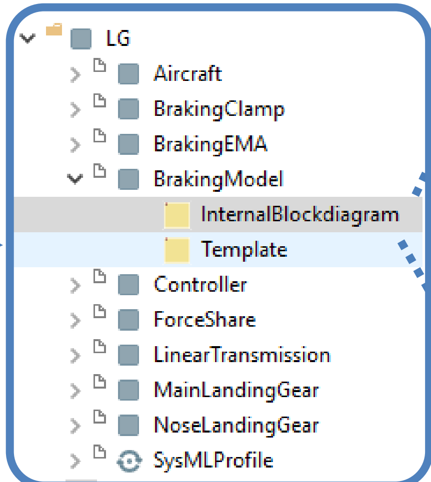
IBM Rational DOORS

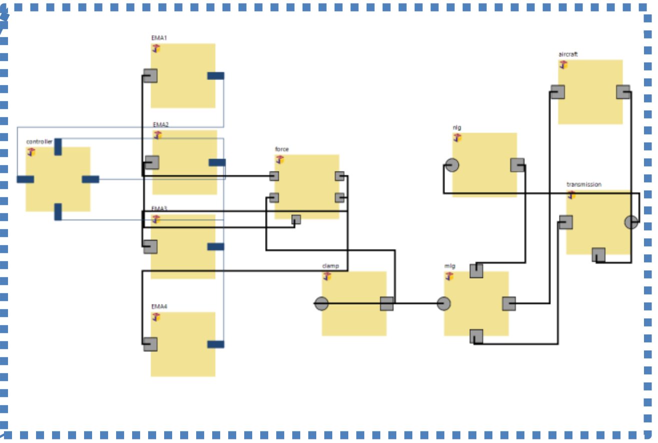


Task:
Design new EMA braking system

To Systems Engineering…





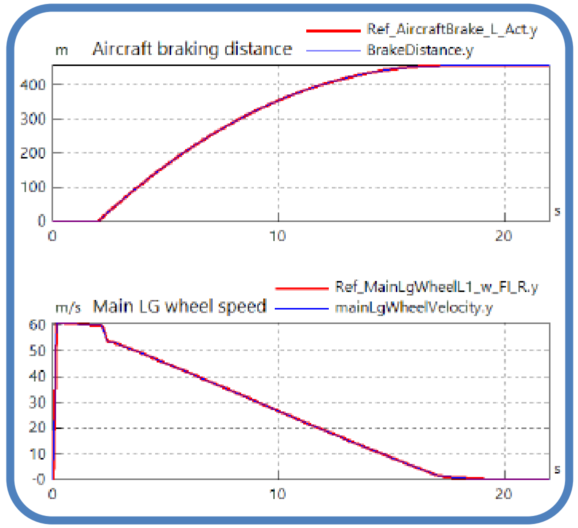


VPIL
DESYRE

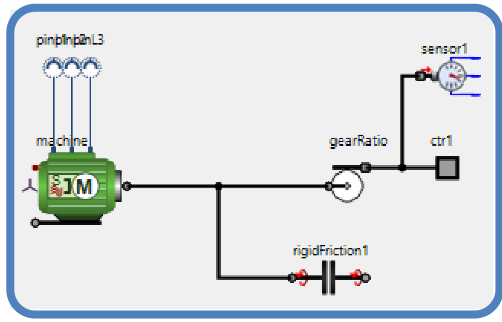
SIL
VEOS

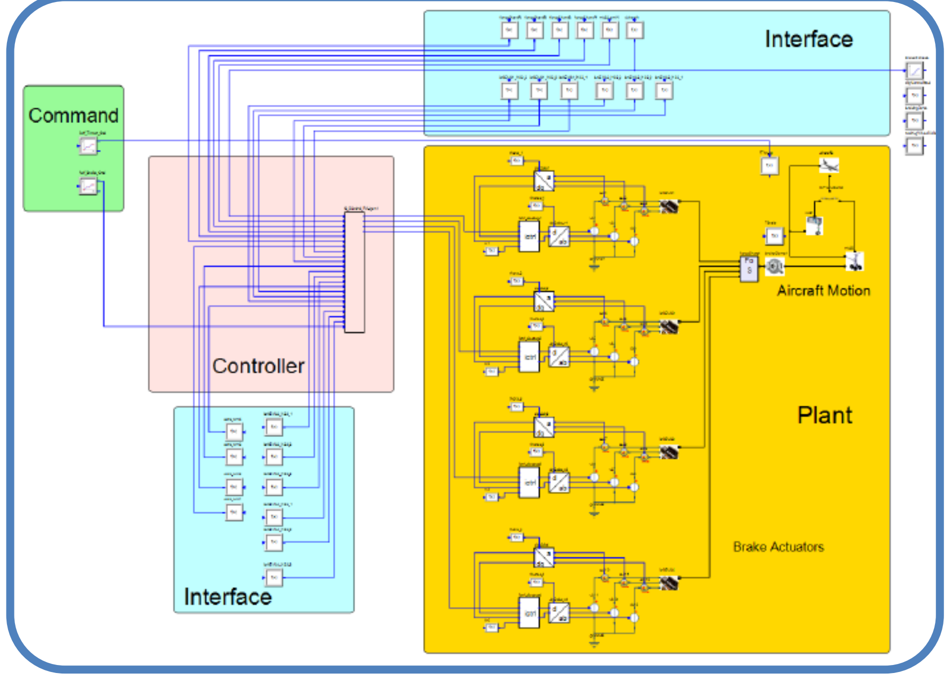
MIL
SimulationX

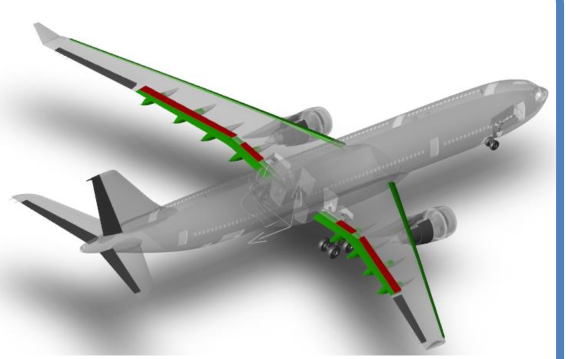
To Virtual Systems Verification



To Components Design and Integration…







RTO: ✓

Highlights:
→ Open, modular framework
→ Linked data and automatism

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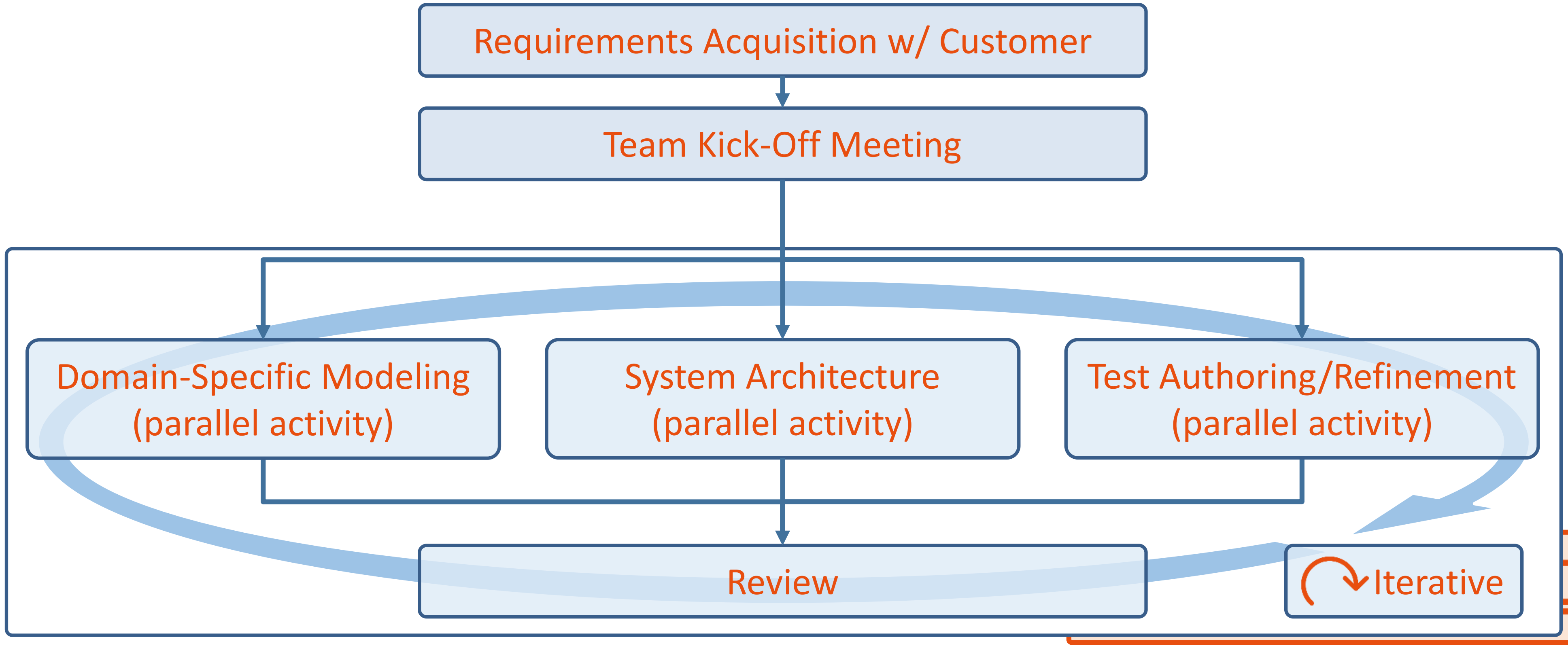
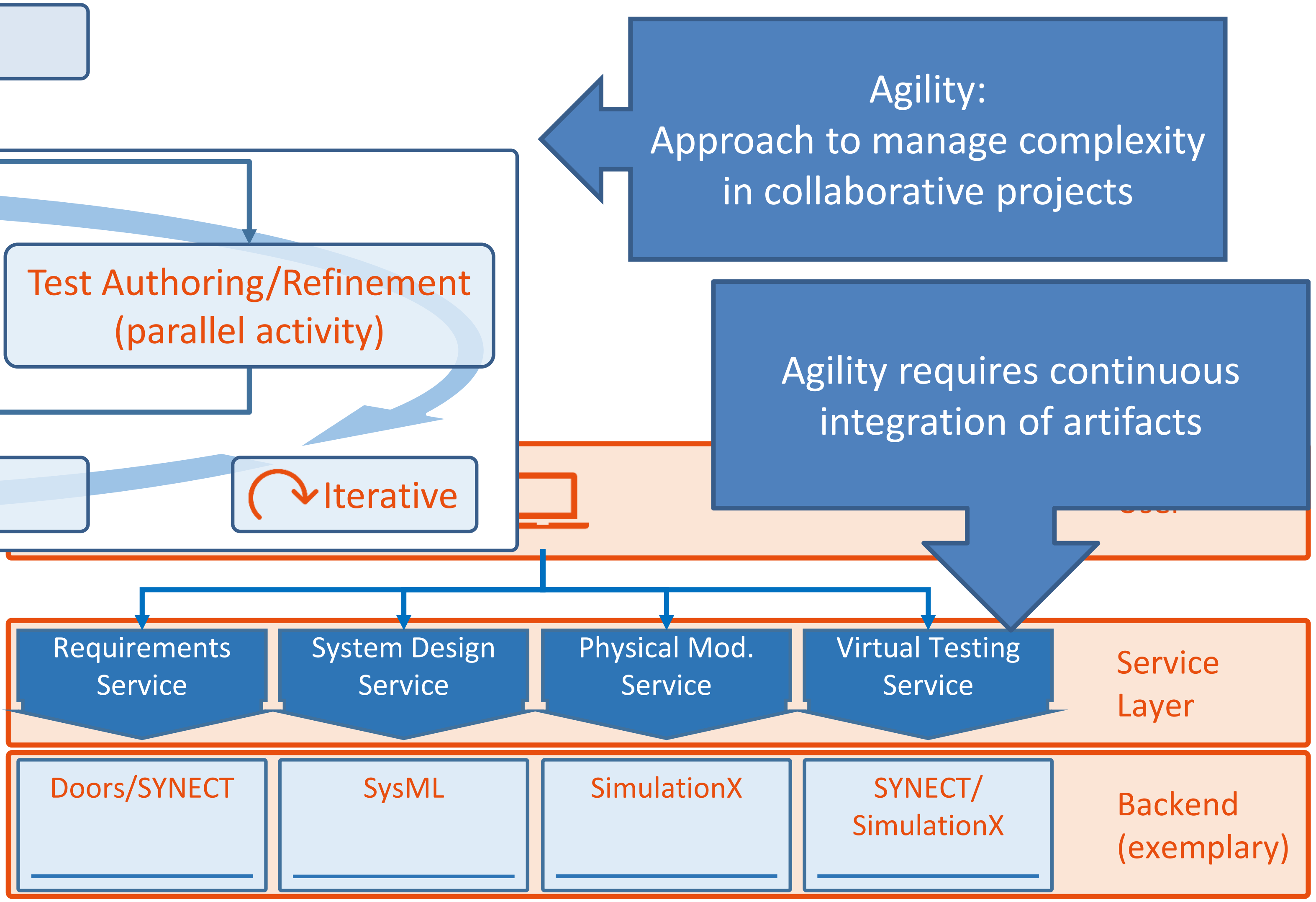
Apply novel Workflow Aspects to Aerospace Design





- Collaborative, parallel interactions
- Iterative and test driven → Agile
- Open, modular, adaptable

Demonstration of Integration Framework

Design and Verification of a Landing Gear Brake Actuator

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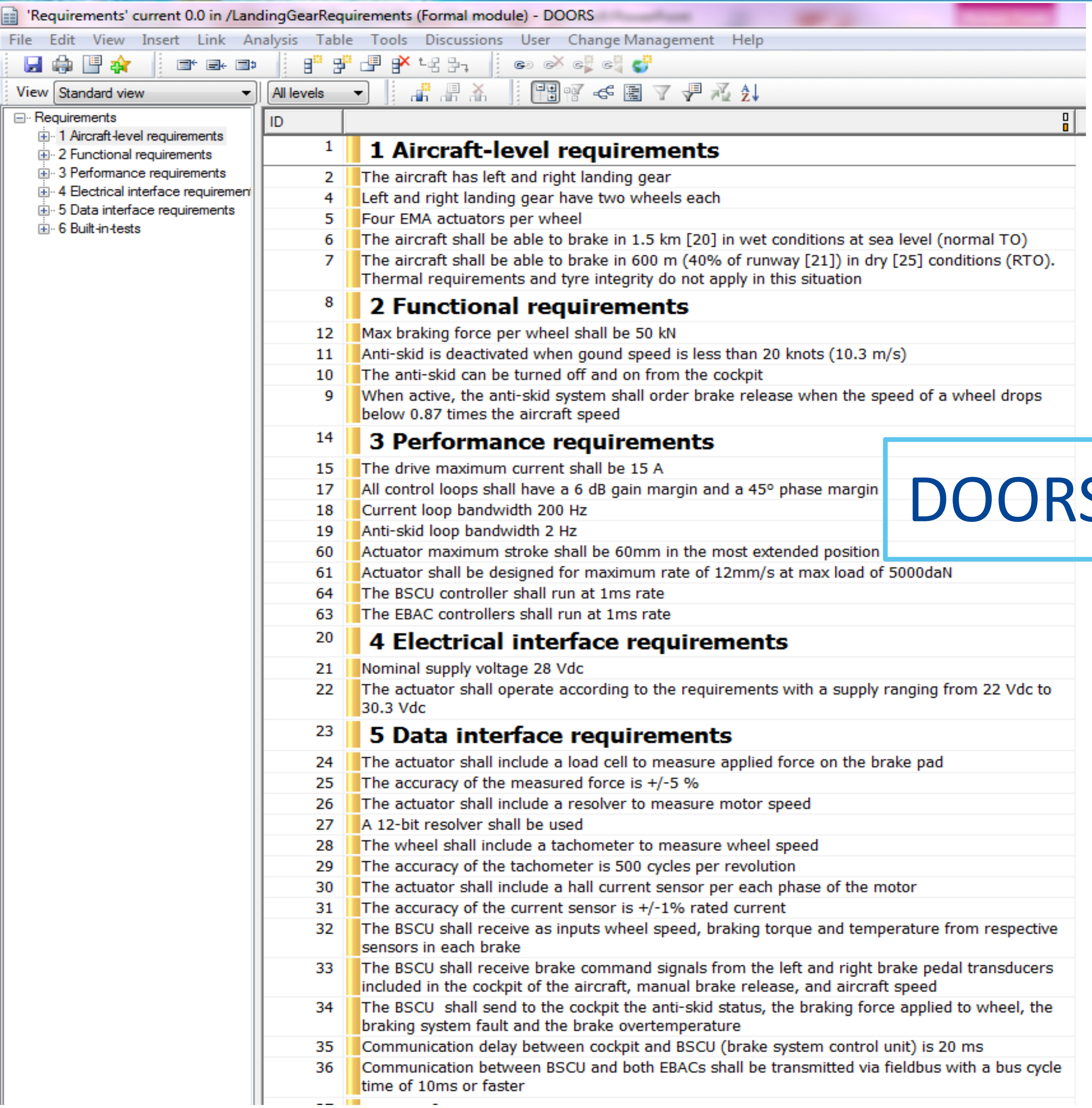
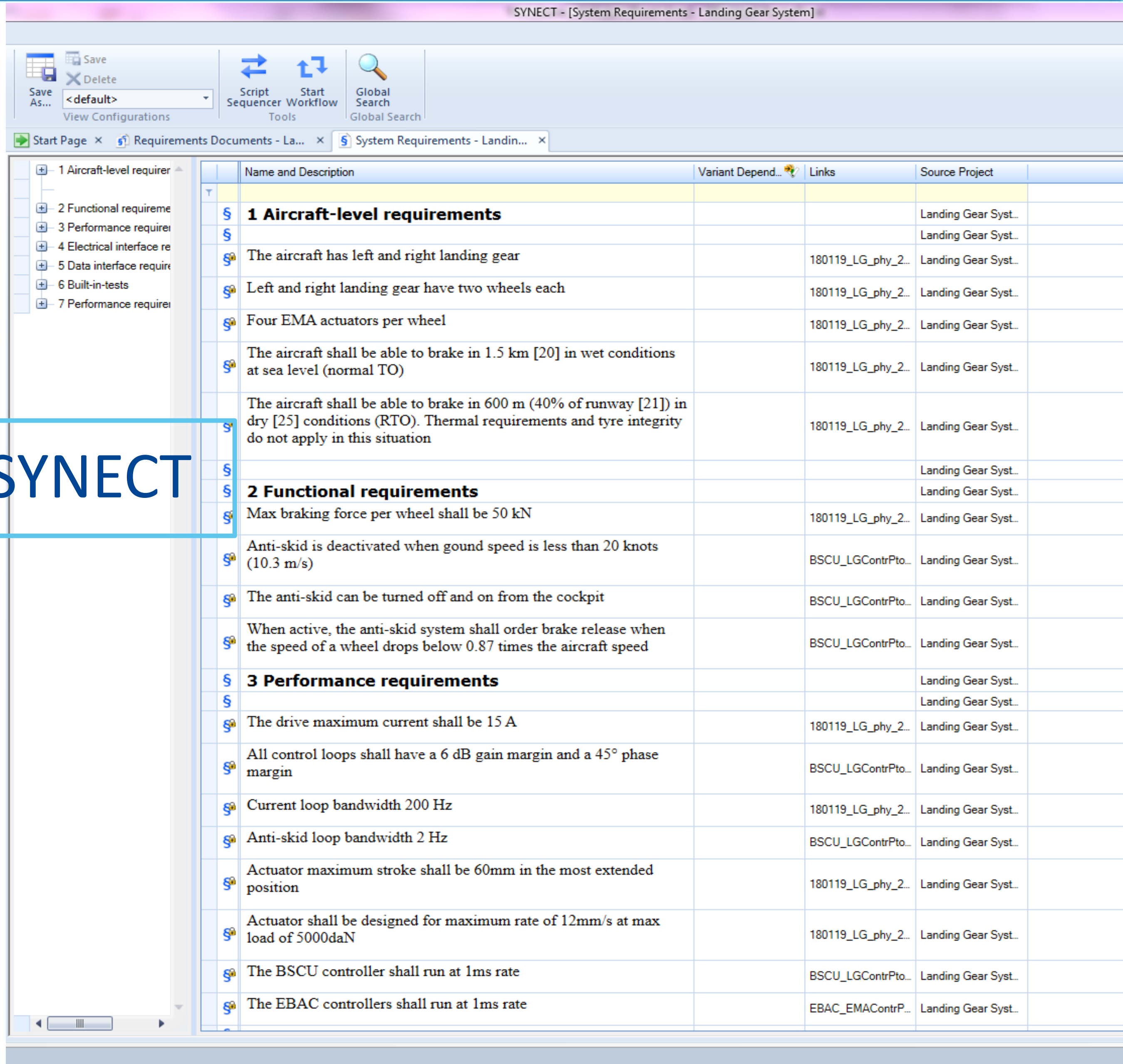
Requirements definition and provision



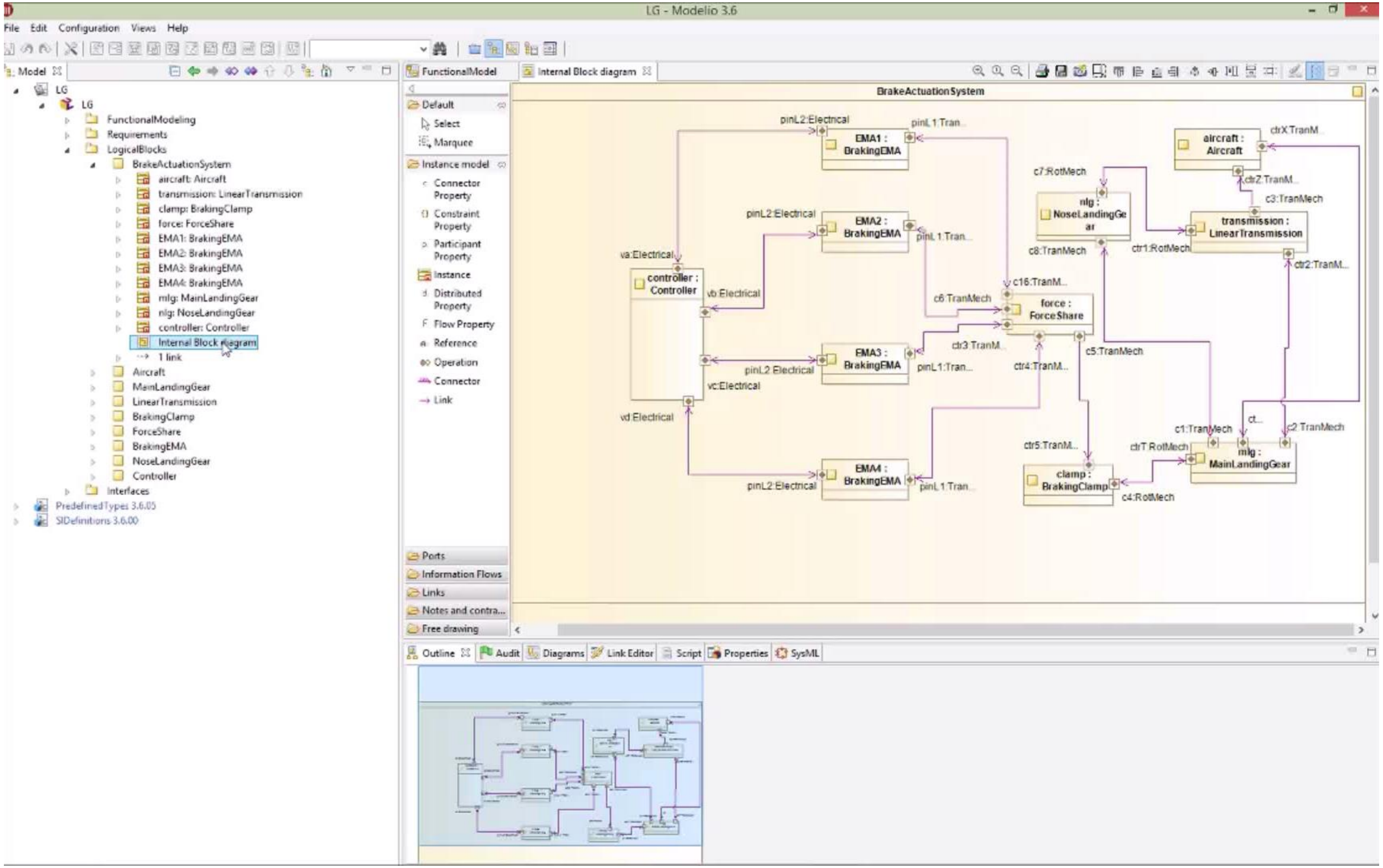
DOORS

ReqIF

SYNECT



CleanSky2 MISSION – WP100.3 Architectural design



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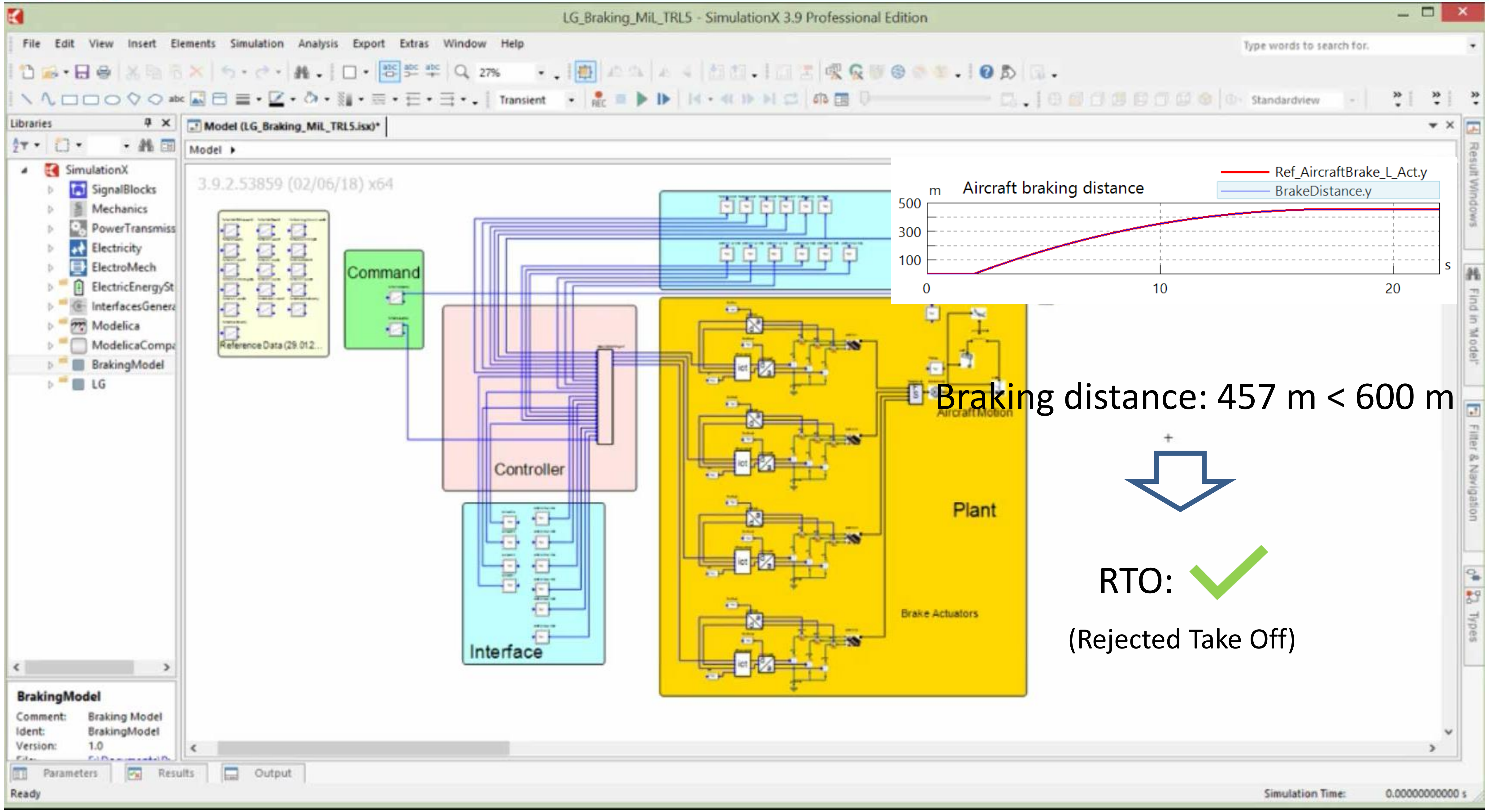
MIL – Simulation and Requirements Verification

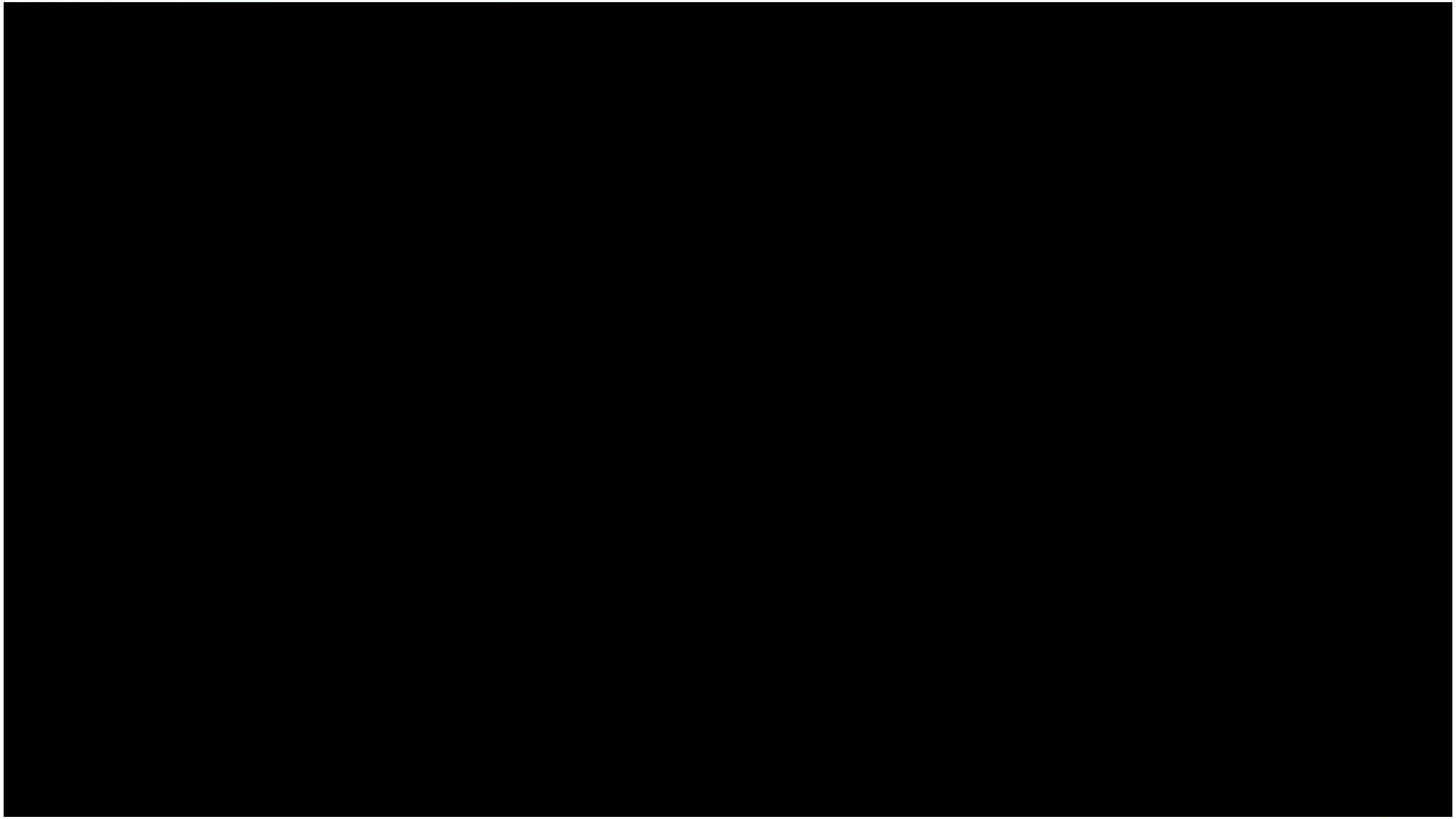


Braking distance: 457 m < 600 m

RTO:

(Rejected Take Off)

System Verification with DESYRE



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Summary of Demonstration

- Achievements demonstrated
  - Open framework: modular, customizable and adaptable
  - Linkage and traceability from requirement to performance model
  - Process safety and reliability by introduction of automatisms into workflow
  - Benefits of incremental virtual testing procedures
  - Continuous integration by virtual testing at early stages

- Ongoing: introducing test authoring and execution towards more automation in test driven development: test definition → model augmentation → test model → test execution → test validation → requirements verification

The project Modelling and Simulation Tools for Systems Integration on Aircraft (MISSION) receives funding from the Clean Sky 2 Joint Undertaking under the European Union’s Horizon 2020 research and innovation program under grant agreement No CS2-SYS-GAM-2014-2015-01.

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Demonstration of the MISSION framework

Technology Readiness Level 5 – Towards workflow integration

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