Virtual hybrid testing. Perspectives concerning research activities and research infrastructures

INTA
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INTRODUCE

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13 years test engineer on INTA
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- Test engineer SW F18, C295, T21, HD21
- PM Meteor environment test
- PM I+D RADAR Test (ARGOS)
- PM IRIS T Surveillance test
- PM Meteor container test
- PM Solar tracker Test

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AGENDA

- Virtual Hybrid Test Definitions
- Virtual Hybrid Test Influence
- Research Activities and Infrastructures
- Perspectives Research Activities and Infrastructures

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Virtual Hybrid Test definitions

Live Testing:
- Structured use of a final product based processes to critically demonstrate its behaviour against high level objectives and requirements in its operational environment.

Real Testing:
- Structured use of prototype and facility based processes to critically evaluate a real product behaviour in a configuration against specified requirements in a test environment.

Virtual Testing:
- Structured use of modelling and simulation based processes to critically evaluate a real product behaviour in a configuration against specified requirements in a test environment.

Virtual Hybrid Testing:
- Structured mix of virtual testing and real testing to evaluate a product against behaviour in a specific environment.

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Virtual Hybrid Test influence

Evaluate as soon as possible

Late changes – Negative influence (cost, flexibility, quality...)

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Virtual Hybrid Test influence

Virtual hybrid test MUST BE planned

User requirement → Specifications → Preliminary design

Specifications → Acceptant Test

Preliminary design → Integration Test

Integration Test → System Test

System Test → Unitary Test

Unitary Test → Manufacture

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Virtual Hybrid Test influence

- Virtual hybrid Test typologies Vs development influence
  - Virtual environment - real prototype
  - Minimum virtual - maximum real prototype
  - Maximum virtual – real piece

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Research Activities and Infrastructures

Actual methodology

Virtual design → Prototype → Virtual Hybrid Test → Certification?

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Research Activities and Infrastructures

Continuous improvement. Used successfully in different areas

PROBLEMS

- Confidence. Not enough confidence at the moment.
- Not harmonised. Uncertainty about practice, development and capability.
- Not re-use
- Acceptance
  - Defence
  - I+D
  - Civil certification

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Confidence
Harmonised
Same Acceptance

Collaborate industries and authorities to approach a virtual hybrid test architecture framework.

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Perspectives

- Validation virtual hybrid test:
  - Assess evidences of correctness and credibility of modelling (comparatives results Vs modelling).
  - Accredited, improvement models, calibration, confirmation test the modes, performance, sensitivity.
  - Historical assessment facilities effective
  - Appropriate verification and validation documentation
  - Integrate verification in process
  - Accurate risk assessment for prioritizing.

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Perspectives

Virtual improvement:

- Instrumentation
- Environment simulation (comms, buses).
- Confidence
- Accuracy and precision
- Test Tools

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Conclusions

- Virtual Hybrid Test increase every year.
- Improve confidence and accuracy.
- Modification old infrastructures or new facilities including new systems.
- Plan Virtual Testing.
- Test Tools needs budget and resources (cost today save money tomorrow).

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Thanks for your attention

Question?

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