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# INCOSE Webinar Series

Wednesday 17<sup>th</sup> June 2020 – Webinar 138

**SE Driven Modelling &  
Simulation Method; a Paradigm  
Shift in Digital System  
Development**



Pascal Paper



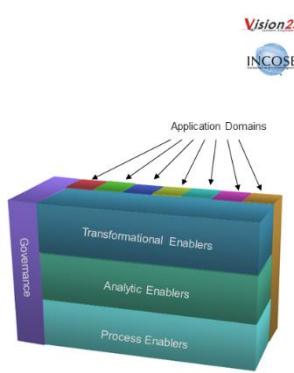
# With thanks to our Sponsor for 2020



# INCOSE is offering Webinars...



27<sup>th</sup> annual **INCOSE**  
international symposium  
Adelaide, Australia  
July 15 - 20, 2017



**IN**SIGHT

Systems Engineering



2017  
annual **INCOSE**  
international workshop  
Los Angeles, CA, USA  
January 28 - 31, 2017

- To provide a forum for experts in the field of Systems Engineering to present information on the “State of the Art”
- To explain how INCOSE works, and how to make the most out of INCOSE membership

# INCOSE Systems Engineering Professional PDU Credit



Please note that you can claim 1PDU credit towards your Systems Engineering Professional re-certification by attending this webinar. INCOSE webinars may also apply to the PDU requirements of other organizations, depending on the subject matter

To qualify, you must have attended through at least 75% of the webinar for webinars that last less than one hour, or through 45 minutes of the webinar for webinars that last for 1 hour or longer.

Here is the link to details about certification renewal, including information on PDUs.

<http://www.incose.org/certification/CertProcess/CertRenew>

# Choreography

1. Andy Pickard (your host) will introduce the Webinar and the speaker
2. Pascal will speak for about 40 to 45 minutes
3. During his talk, participants can write questions using the Webex Q&A window
4. After Pascal completes his talk, he will spend 10 minutes answering questions that Andy selects from those submitted by the audience
5. Andy Pickard will provide information about upcoming Webinars and then end this session
6. This Webinar is being recorded and will be made available on the INCOSE website to members and employees of CAB organizations



# SE Driven Modelling & Simulation Method: a Paradigm Shift in Digital System Development

PAPER Pascal  
[pascal.paper@airbus.com](mailto:pascal.paper@airbus.com)  
Phone: 00 33 6 09 26 79 58  
DDMS business change and V&V leader  
Modeling & Simulation stream  
AIRBUS SaS  
25 Jan 2020

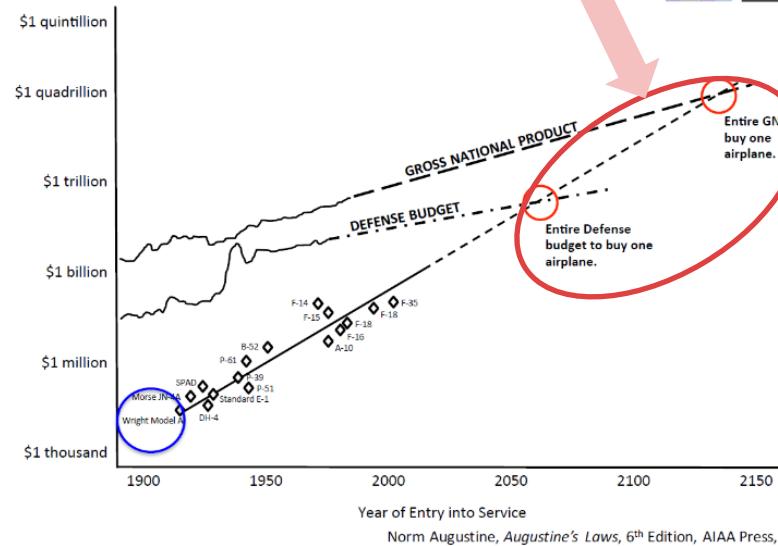


17 June 2020 Webinar

# 1) The problem to solve

 **Problem**

Augustine's 16<sup>th</sup> Law



CONOPS and System requirements must be effective driver...

...and then for systems tests, Certification & support

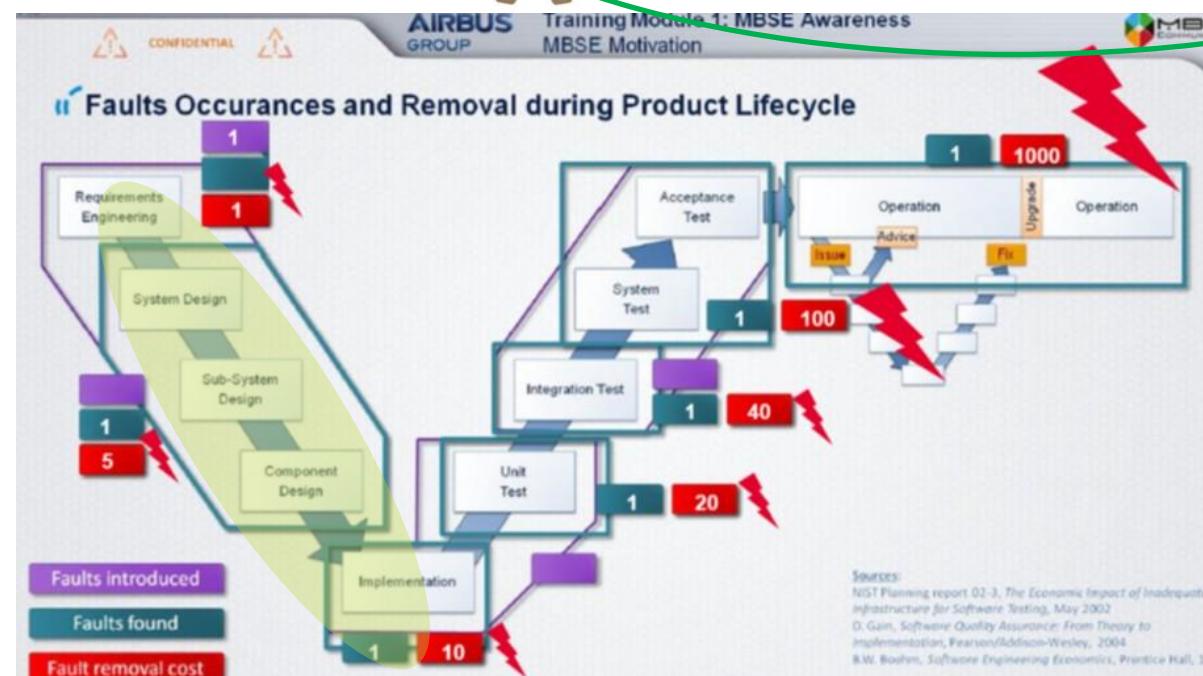
**The need:**  
-Specify the right System  
-Design the System right  
-Deliver the right product

... for System architecture & design ...

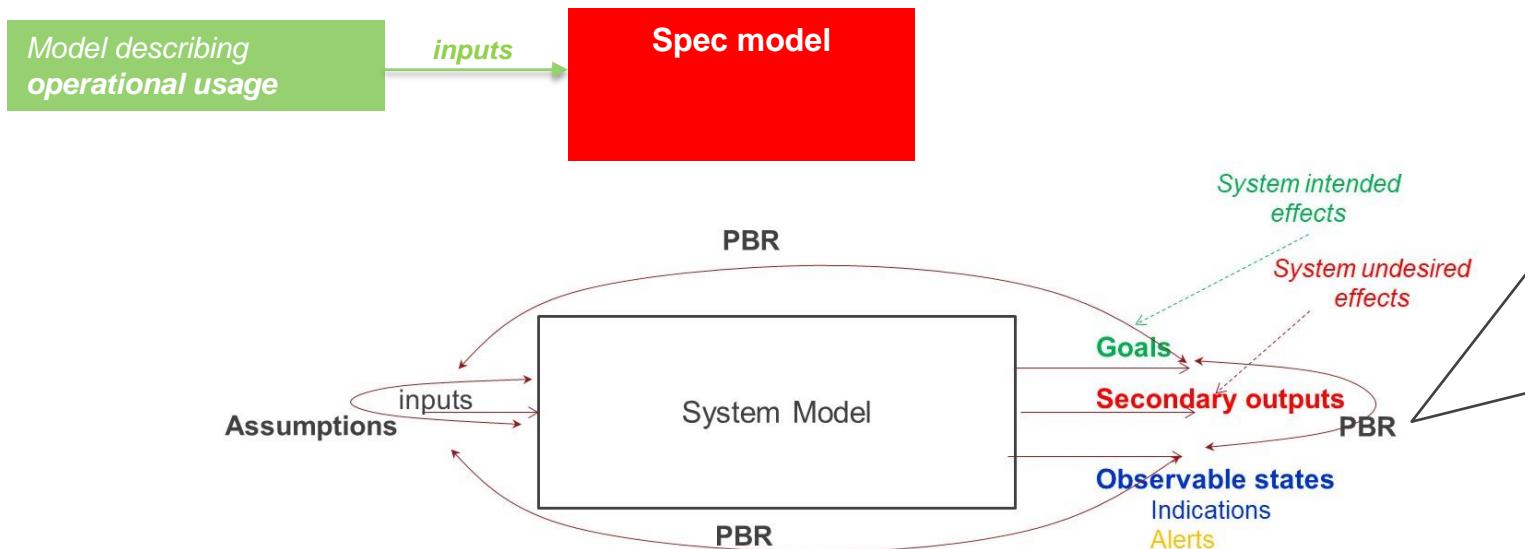


**Requirement modeling & early V&V METHOD**  
-Sound modeling & simulation goals  
-End2end coherent guidance

**Technologies (language, framework, M&S tools,...)**  
-Implement the method  
-Store, organise, share, manage data...



## 2-1) PMM a Method for System Requirement capture & validation

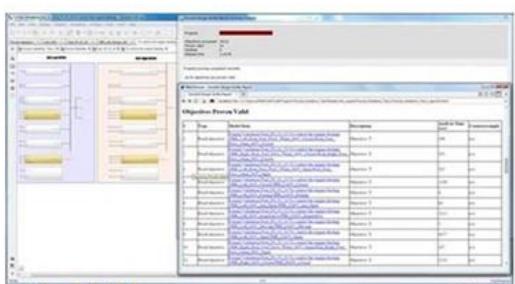


Specification modelling sequence (**PBB**) is a backward process from the effects to the causes:

## 2-1) Formal validation

- **Goal** is to remove from specification models:

- ✓ **Logical holes** (logical completeness)
  - ✓ **Logical contradictions** (logical correctness)



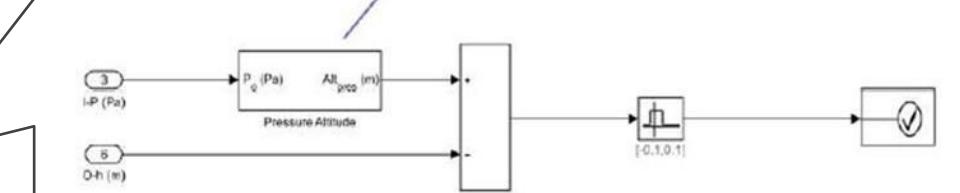
## ➤ Way:

- ✓ Instrumentation Resource : proof means
  - ✓ Human Ressource: **Modeler**
  - ✓ Computation Ressource: SLDV prover

When  $C \rightarrow \text{val}(O.P) \in D$

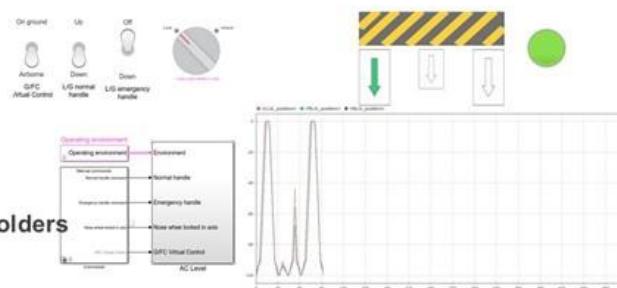
When **condition C** is true, **property P** of **object O** is actual and its value shall belong to **domain D**

WHEN THE HC EXPERIENCES AN ACTUAL PRESSURE  $P_a$   
THEN IT SHALL EXPERIENCE AN ACTUAL PRESSURE ALTITUDE  $h$   
DEFINED BY THE TRANSFERT FUNCTION Pressure Altitude



## 2-2) Factual validation

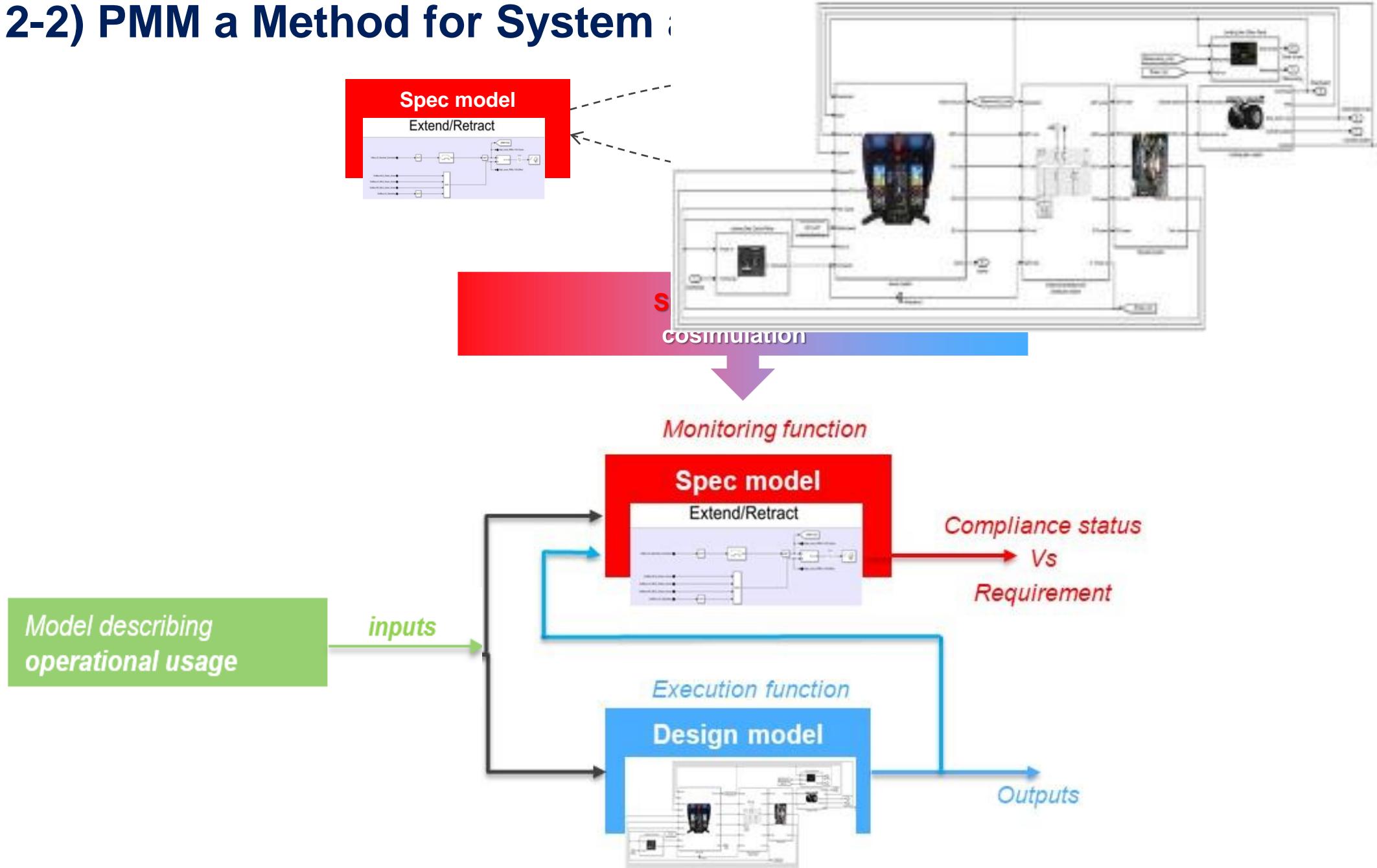
- **Goal** is to reach an agreement among relevant stakeholders on
    - ✓ Factual completeness: stakeholders **jointly** consider **all needs covered**
    - ✓ Factual correctness; → stakeholders **jointly** consider **simulated behaviors** are the **right ones**



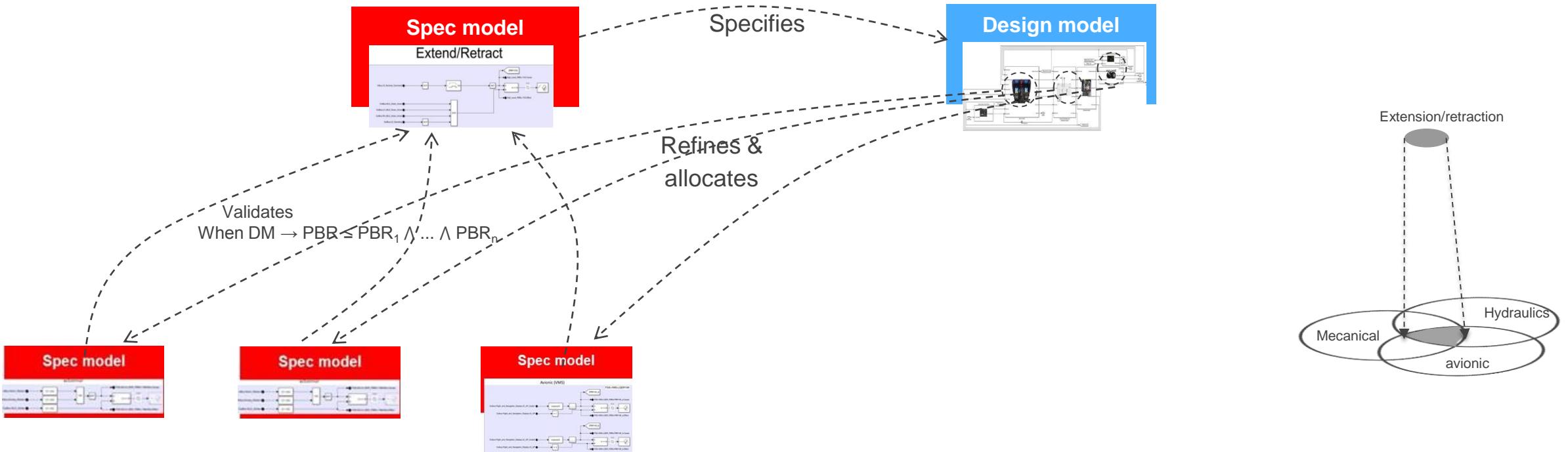
## ➤ Way:

- ✓ Instrumentation Resource :
    - ✓ Validation **bench**
    - ✓ Validation **scenarios**
  - ✓ Human Ressource: Relevant stakeholders

## 2-2) PMM a Method for System



## 2-3) PMM a Method for Requirement refinement capture & validation



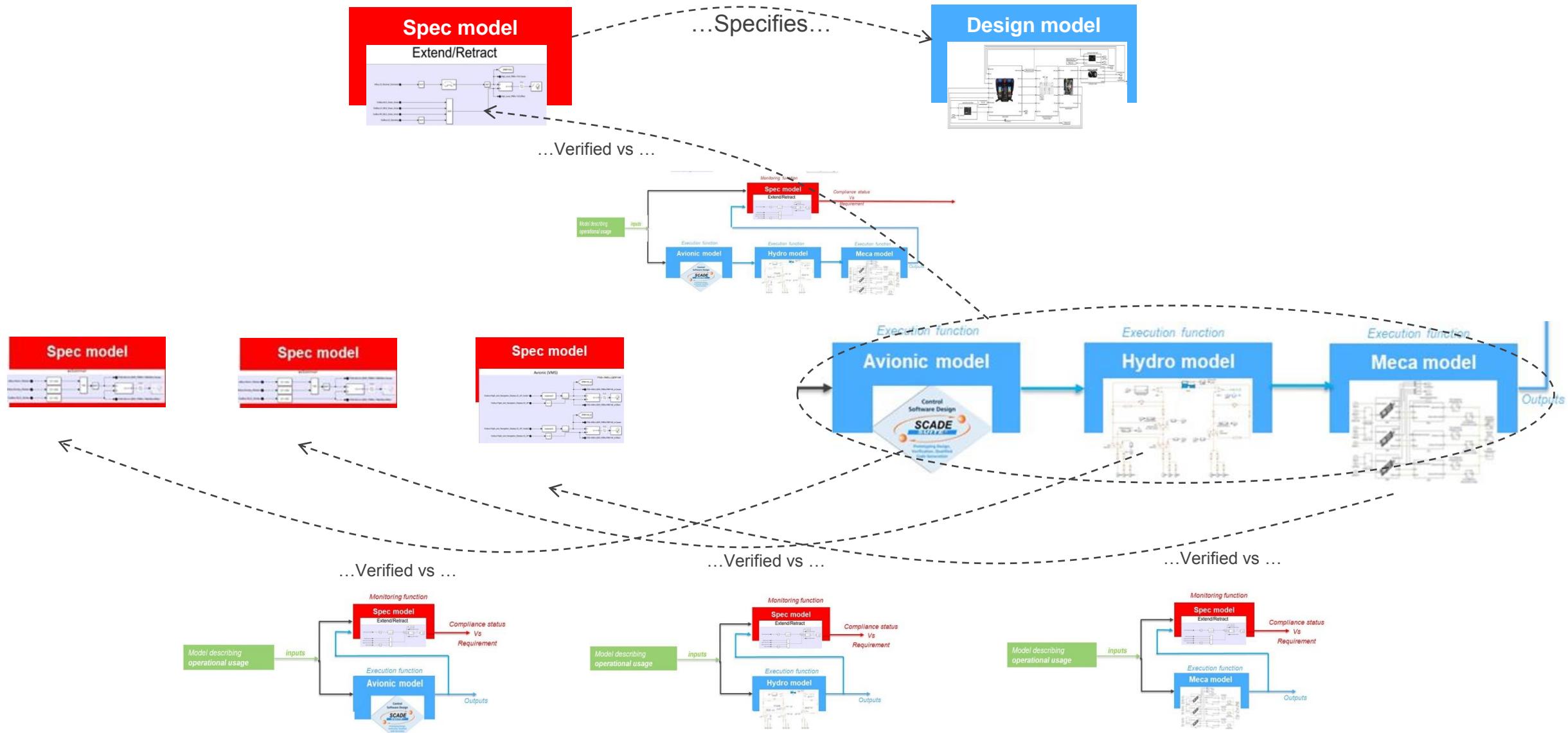
### ➤ Goals:

- ✓ to **refine** system **requirements** into subsystem requirements
- ✓ to **validate** the refinement (system req -> subsystem req)

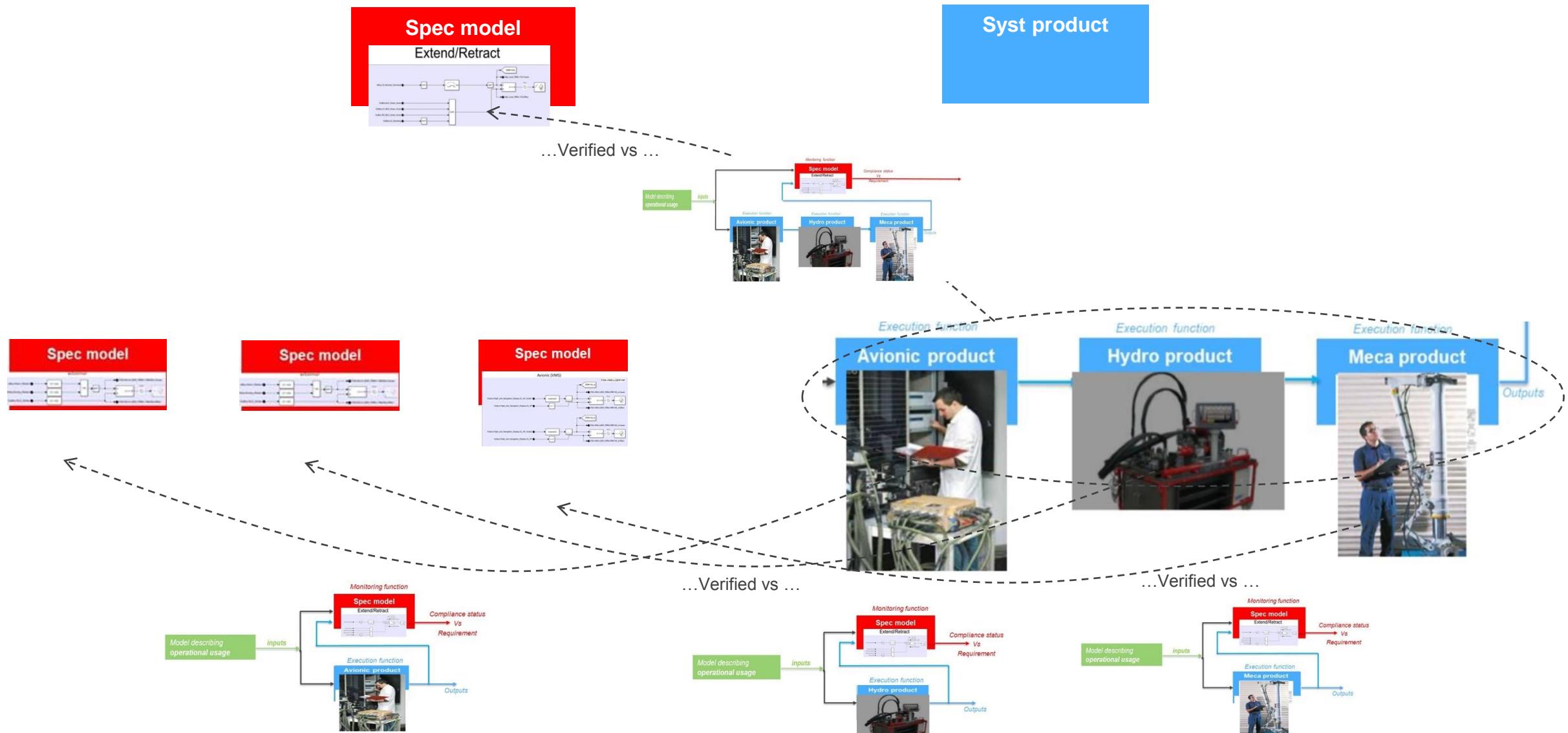
### ➤ Way

- ✓ Refinement based on Suh's zig **zagging** concept
- ✓ Validation : SLDV prover & simulation

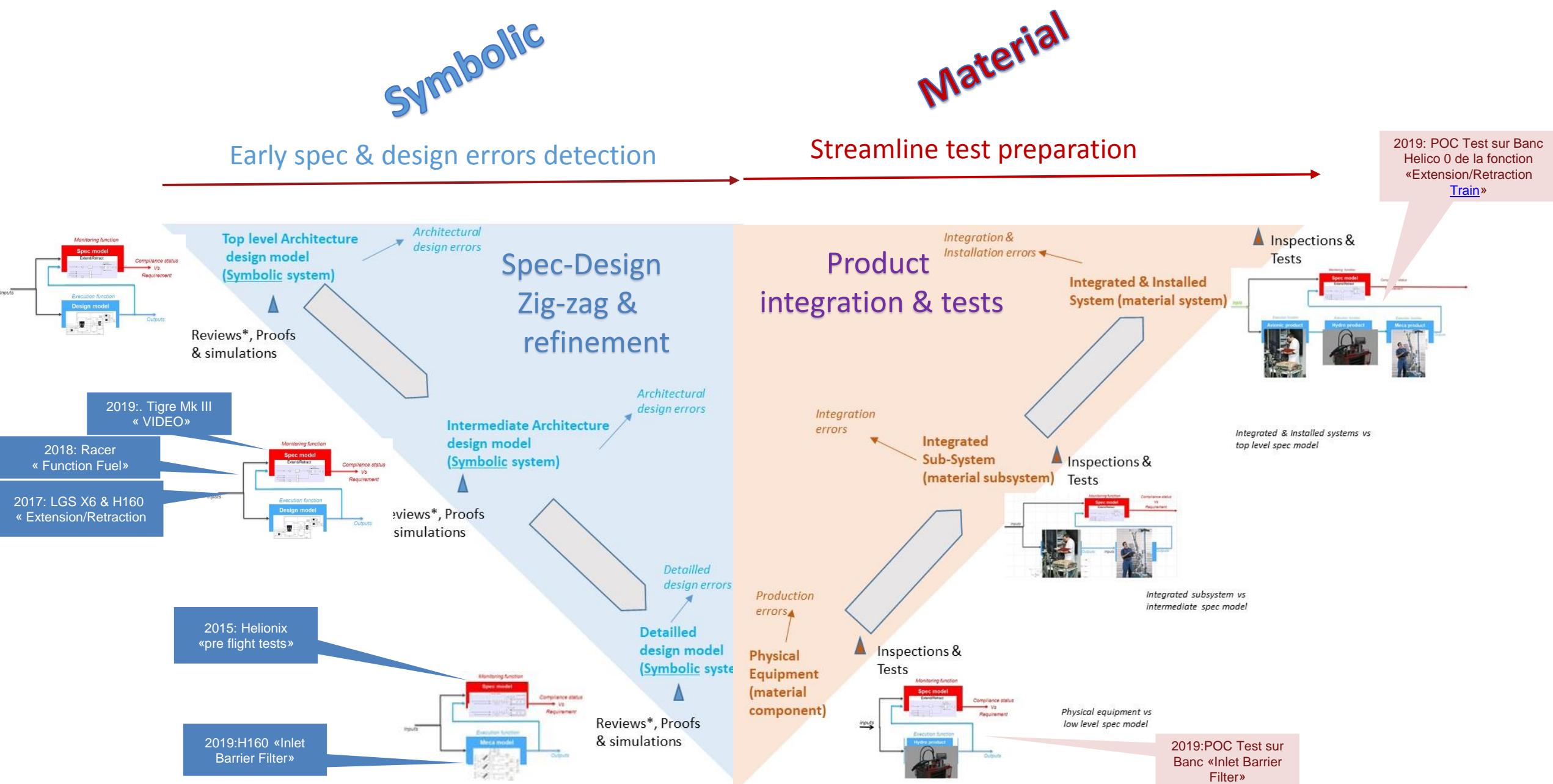
## 2-4) PMM a Method for System design verification



## 2-5) PMM a Method for System product verification



### 3) Evidences of PMM application

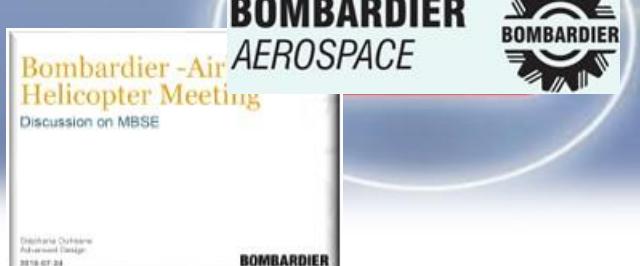
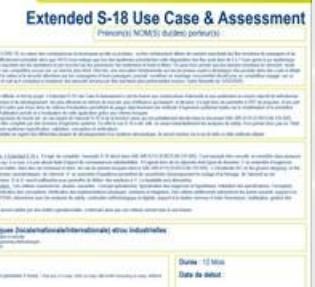
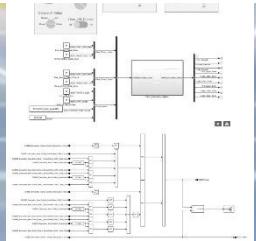


## 4) The method starts to be worldwide recognised

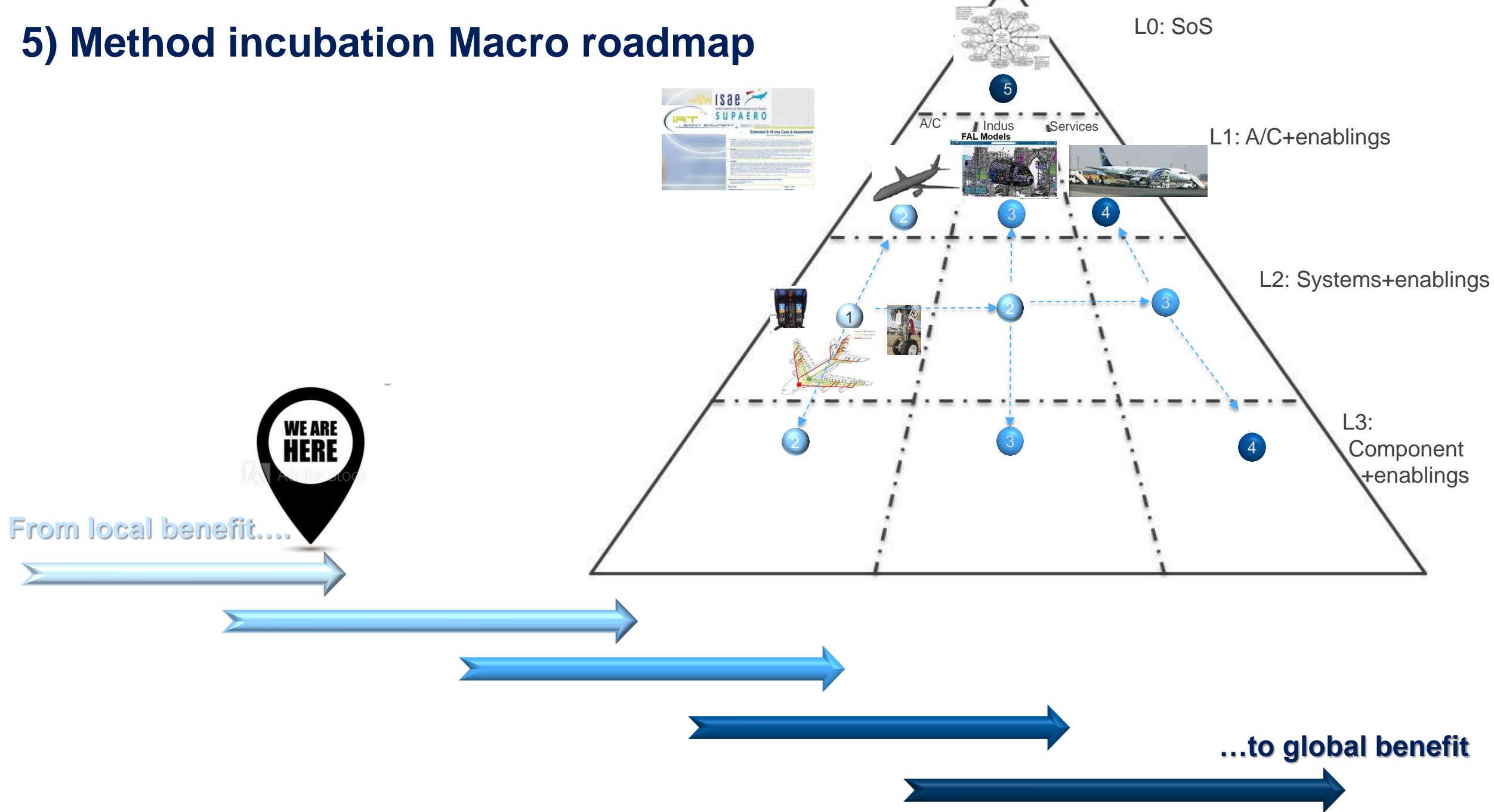
## publications



IYU fuel



## 5) Method incubation Macro roadmap



THANK YOU FOR YOUR ATTENTION  
Any questions?



# Upcoming Webinars (tentative schedule)

Who	What	When
Courtney Wright	Fundamentals of Certification	Wednesday 24 <sup>th</sup> June 2020 at 11am EDT
William Donaldson	Digital Enterprise Transformation using MBSE: Notes from the field and the C-Suite	Wednesday 15 <sup>th</sup> July 2020 at 11am EDT

Invitations will be emailed in advance and informational updates will be placed on [www.incose.org](http://www.incose.org)

Go to <http://www.incose.org/products-and-publications/webinars> for more info on the webinar series, including a way to view the last 137 Webinars and soon – this one!

Information on the webinars is now being posted in INCOSE Connect, in the INCOSE Library area, at

<https://connect.incose.org/Library/Webinars/Pages/INCOSE-Webinars.aspx> .

Joining instructions will be added around two weeks before the webinar is scheduled to take place.

# Latest News – Webinar Showcase



Please visit this site for links and information about the new Systems Engineering Exchange Webinar Showcase series, Best Papers Showcase and SE101 Showcase:

<https://www.incose.org/about-incose/community/webinar-showcase>

The showcase webinars will be posted on LinkedIn and in the INCOSE Connect Webinar Library



A better world through a systems approach

Systems Exchange Cafe

**Webinar Showcase**

Best Papers Showcase

SE101 Showcase

## Webinar Showcase

- part of INCOSE's Virtual Community Offerings

As a part of the INCOSE Virtual Community offerings we are showcasing select webinars on a range of Systems Engineering topics.

For the INCOSE Webinar Showcase we have selected several webinars for your viewing and then discussion with fellow Systems Engineers and Thinkers.



This week we will be showcasing **Family of Systems Disciplines** by **Zane Scott**, originally presented on 20<sup>th</sup> November 2013. There are a variety of systems disciplines all of which employ the concept of systems as a set of component elements related to each other and operating in ways that are determined by the relationships. This affords a system functionality beyond even the sum of the functionality offered by the component elements. What the various systems disciplines offer to each other is the variety of perspectives and approaches that those disciplines bring to the study and design of systems. Each discipline provides some unique way or ways of approaching systems problems and each one can profit by the contributions of the others. From dealing with complexity to thinking about emerging behaviors the disciplines can shine their lights beyond their traditional domains. This webinar explores some of those differences and suggests ways in which the disciplines can intersect opening new solutions and new market spaces for each other.

Zane has kindly agreed to refresh this material, so there will be a new broadcast on **Thursday 4 June from 11am – 12pm EDT**.

Please click [here](#) to register for the webinar and/or [here](#) to join the webinar.

Event number: 592 107 744, Event password: INCOSE

Next week will feature **Randall C. Iliff, Eric S. Rebentisch and Stephen Townsend** on **Three Years Later – Building the Mindset for PM / SE Integration**

Many changes have occurred during the three years since the publication of the groundbreaking book, Integrating Program Management and Systems Engineering.

This session will explore these and other ways in which the organizations continue to build the "New Mindset" required for success on today's engineering program challenges. Every System Engineer knows how critical the relationship with Program Management can be, and too few of us have experienced the magic that occurs when PM and SE are in sync throughout a project.



# INCOSE International Symposium Virtual Event, 20 – 22 July 2020



30<sup>th</sup> Annual INCOSE  
International symposium

Virtual Event  
July 20 - 22, 2020

Systems Engineering for Earth's Future

<https://www.incose.org/symp2020/home>

## Message from the President

Hello Everyone,

The health and safety of our members, contractors, and alliances remain our highest priority. Thus, in response to the global situation, our premier event, the International Symposium (IS) 2020, will still be held, but not as a physical event. We will be bringing you INCOSE IS 2020 as a VIRTUAL event.

We will be able to connect amazing people, provide a great program, and enable participants to come together. By moving to a virtual environment, we will be able to try new things with the INCOSE IS program, while maintaining the excellent knowledge exchange and social networking that makes the INCOSE IS a unique experience.

The INCOSE IS 2020 virtual event will be held on 20-22 July 2020. It will now be a three (3) day event offering three (3) parallel tracks. Outlined below are some of the benefits you will receive when you register to participate in our virtual INCOSE IS 2020 event.

### You will be able to –

- Participate in real time in any of the sessions.
- Access recorded sessions should the time of the session not be suitable for you.
- Interact with the presenters through chat rooms and follow-up discussions.
- Hear first hand our keynote speakers. We will schedule these sessions at a time where we have the greatest opportunity to support the majority of participants to "watch live."
- Witness the honours and awards bestowed on fellow members, colleagues, and champions of systems Engineering.
- Network across virtual social functions.
- Interact with exhibitors and sponsors through virtual exhibit halls and chat rooms.
- Receive a copy of the proceedings.

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**You can also claim credit for previous webinars you have attended; please contact [info@incose.org](mailto:info@incose.org) if you wish to know which webinars you attended and if you met the qualification requirements**



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