

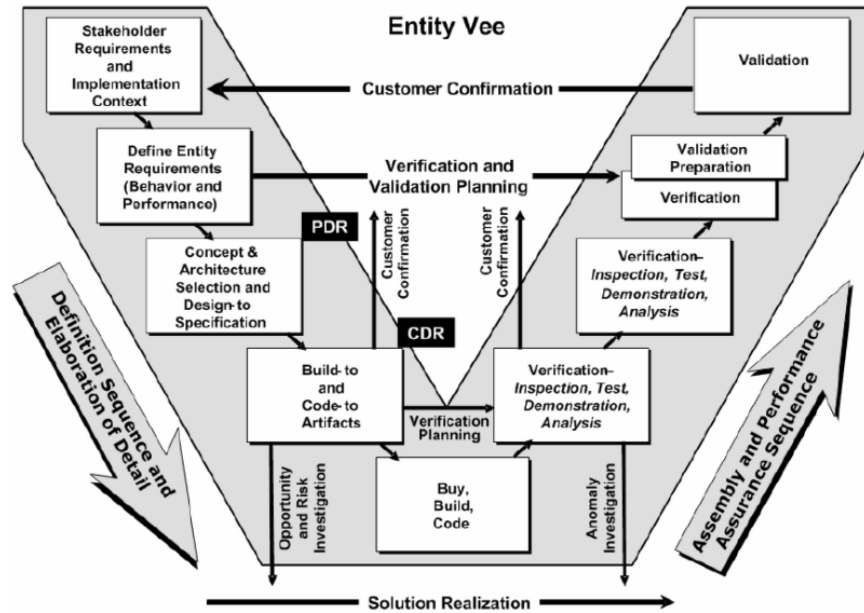
Don't Look Outside the Box

Configuration Management Meeting a 4-box Development Model

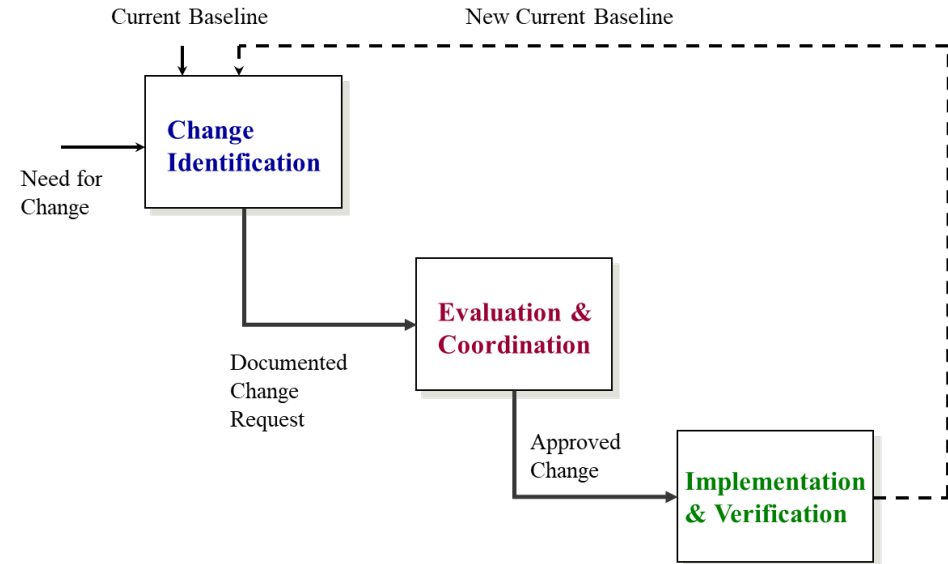
Åsa Nordling Larsson, Johanna Axehill, Erik Herzog
Saab Aeronautics



Once upon a time ...



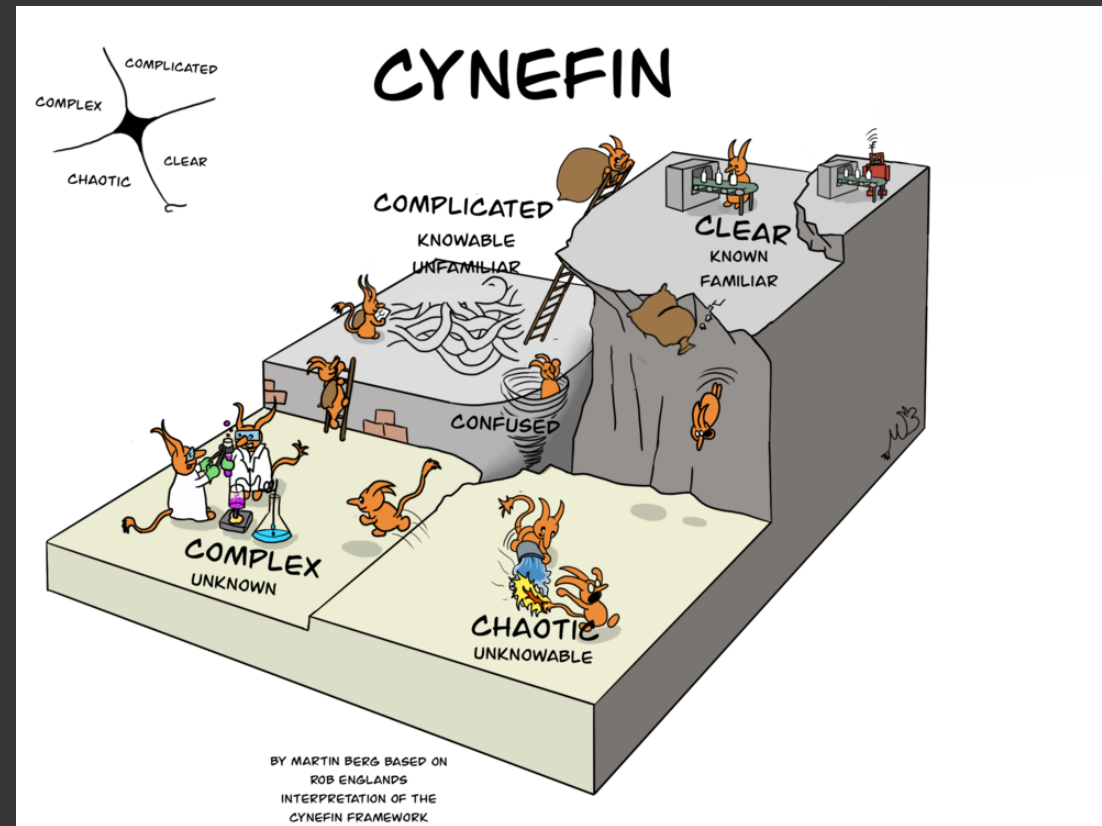
This was development



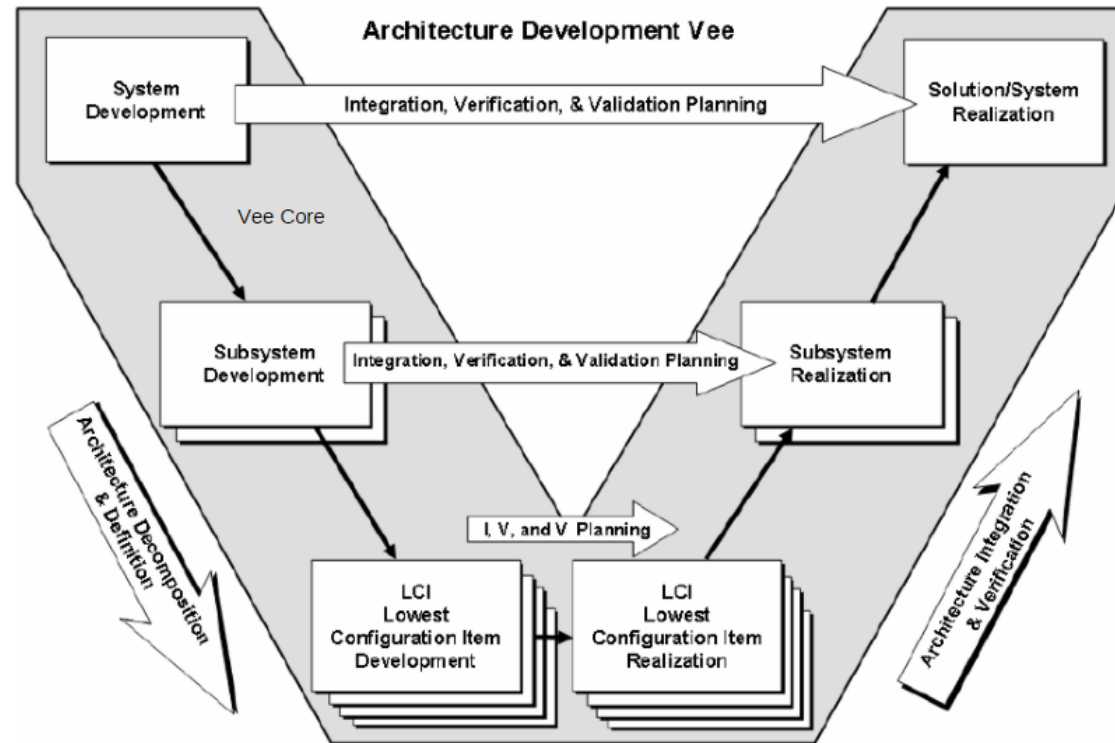
This was Configuration Control

And all was good!

Then we had to accept that complex system development is a non-predictable activity



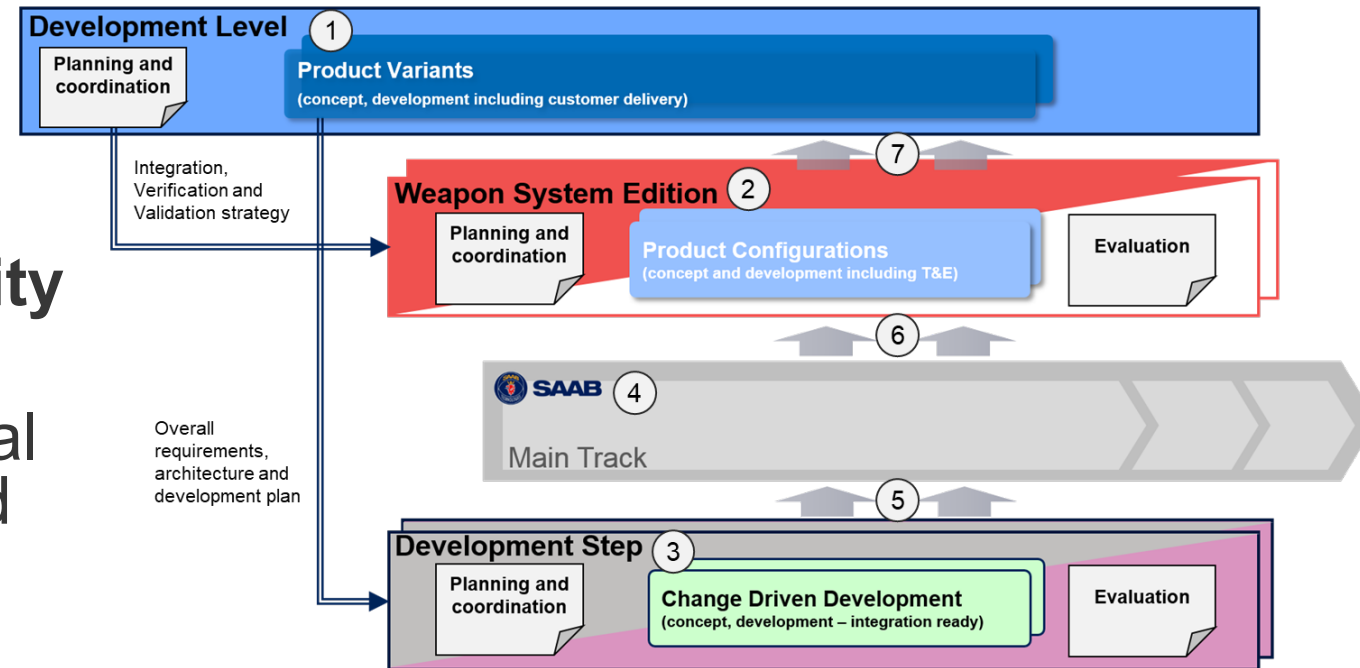
Vee models under non-predictability



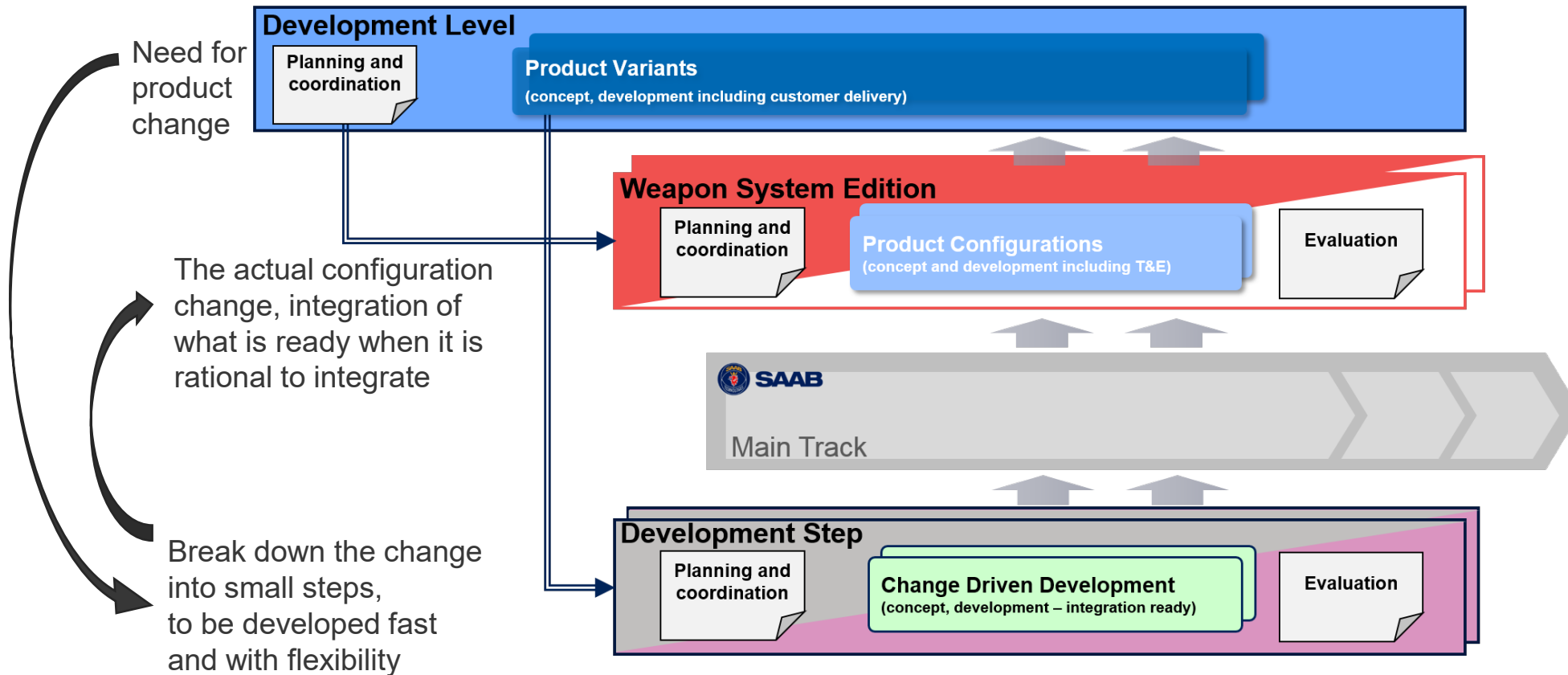
So we changed to a 4
- box development
model

The 4-Box Development Model

- **Development level:** Customer and authority communication – **Slow!**
- **Weapon System edition:** Integrated products, in test aircraft or simulators – **Flexibility in content!**
- **Development step:** Incremental development of capabilities and components – **Flexibility in approach!**
- **Main Track:** Warehouse for all product data – capturing what is available for integration



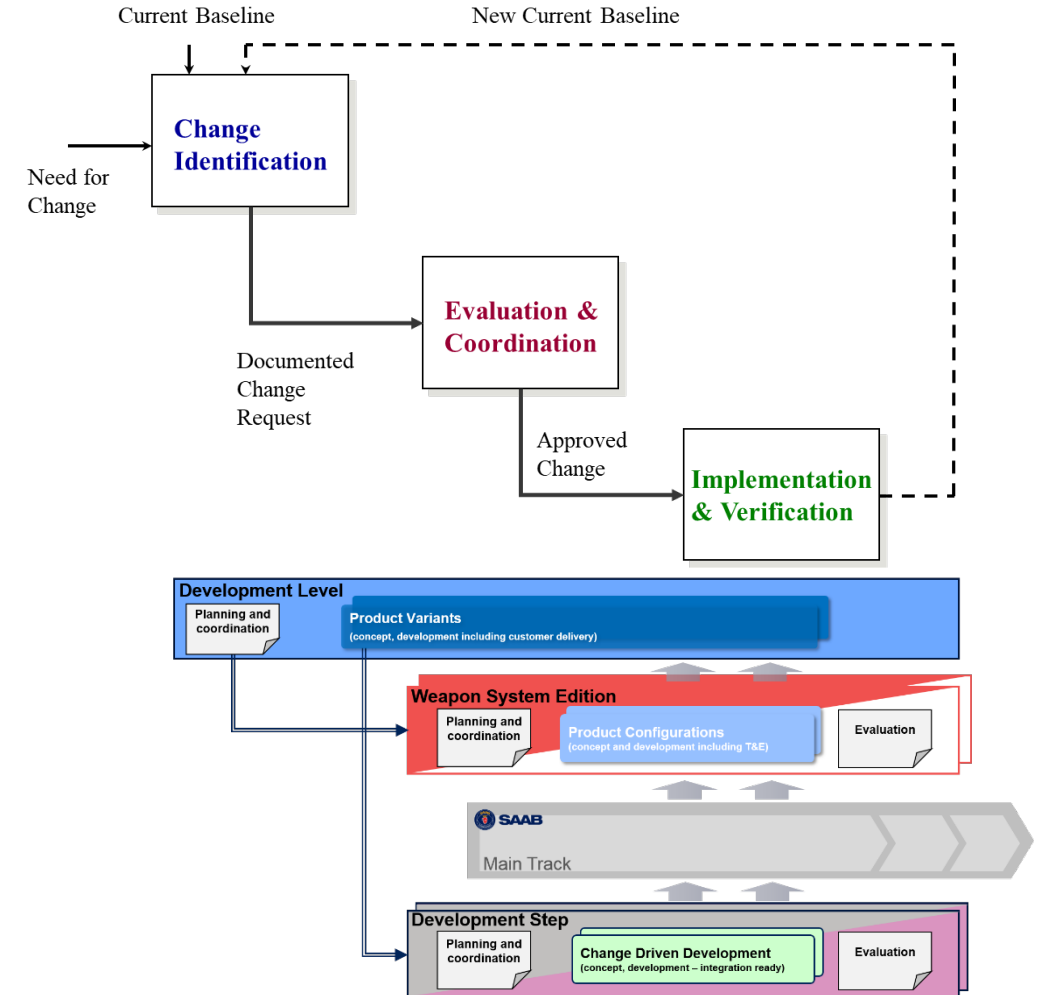
The 4-Box Development Model



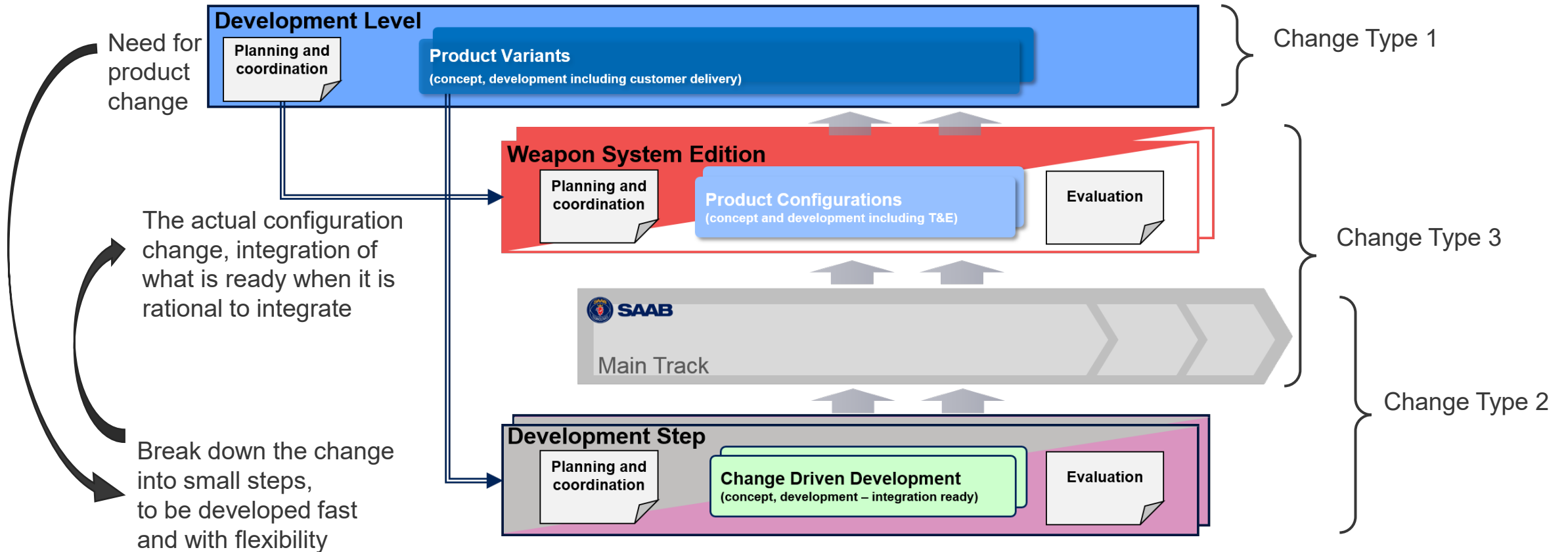
Consequences for Configuration management

Configuration Management - Challenges

1. How to manage situations when a **planned change is not completely ready** – when there is a good integration opportunity?
2. What is the **baseline** when there are **multiple changes in progress**?
 - Will the current, ongoing change activities **deliver the desired capability**?
 - Which of the current, ongoing change activities will **actually be completed** when the new, additional change is completed?
3. Configuration change management is performed in all three boxes – **with the same rule set applied** – is this reasonable?



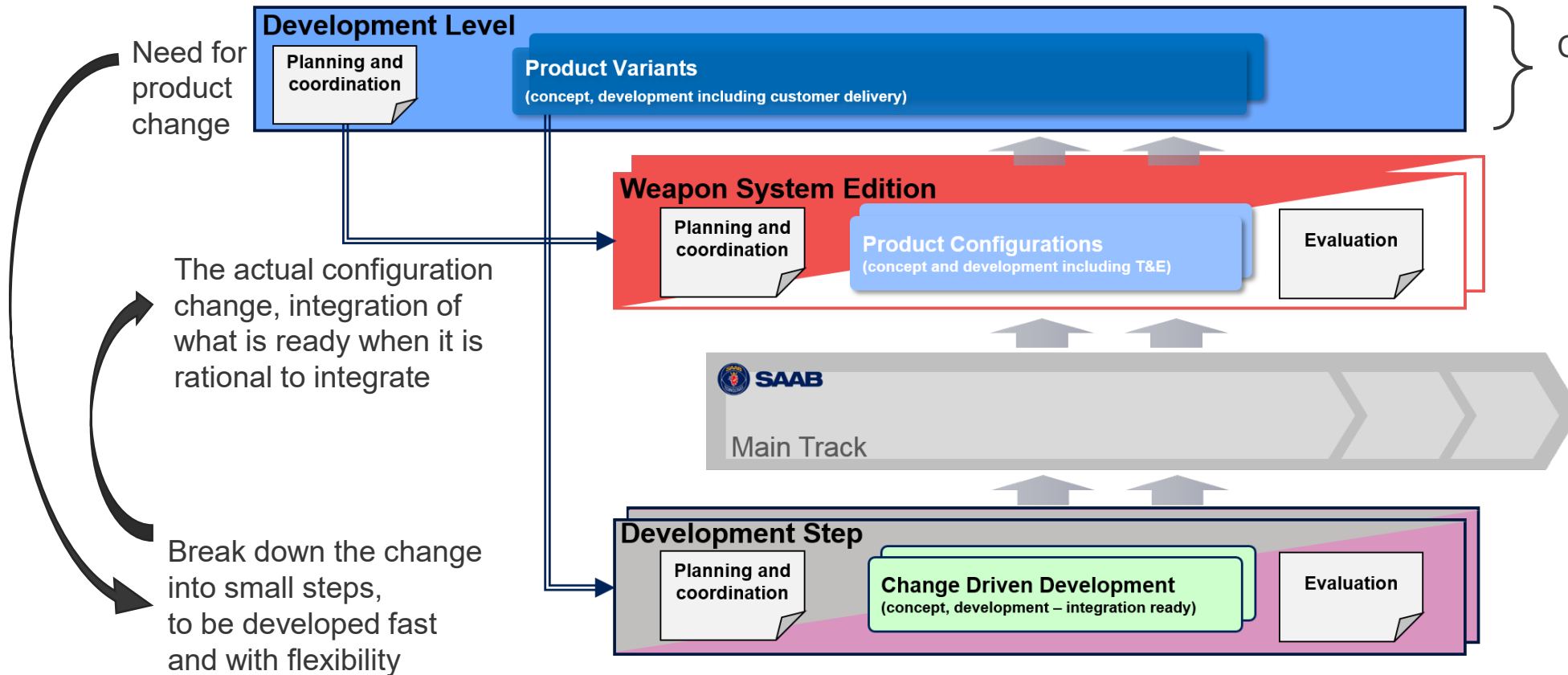
Four boxes – Three Change types



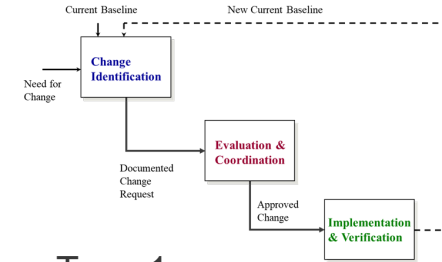
Change types comparison

	Change type 1 (Development Level)	Change type 2 (Development Step)	Change type 3 (Weapon System Edition)
Change scope	Large scope Focused on end-user capability	Small scope Focused on defining activities that can be completed within a short time frame	Scope depends on what is available for integration Focused on a configuration item for inclusion in a product configuration
Time horizon	Long Potentially it may take years to realise the desired capability.	Short Each change item is scoped for realisation in a short time	Short The change item is designed for inclusion in the next product configuration change
Change dynamics	Static Changing the scope of the change item will likely affect contract scope	Dynamic Changes of scope are expected as development progresses and more product knowledge is attained	Static Change items are defined at a late stage where there is a good understanding of what is available
Board decision maker	Product and/or program management	Project and/or team leadership	Chief engineer and/or technical manager

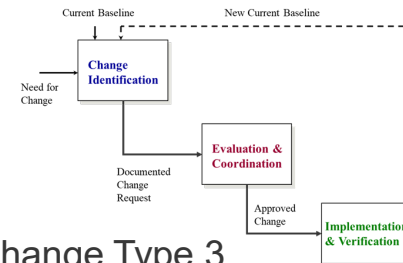
Four boxes – Three Change types



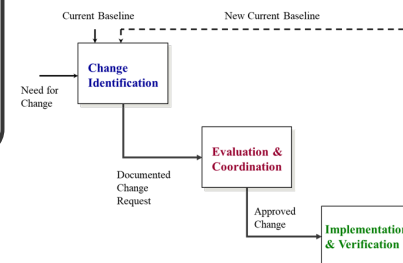
Change Type 1



Change Type 3



Change Type 2



Example

WTLS – wing-tip light sabres



Configuration Planning (initial), change types 1



Program
planning



Configuration Planning (initial), change types 2



Weapons
integration
team

Change type 2:
Strengthening pylon

Change type 2:
Power integration

Change type 2:
Emergency jettison

Change type 2:
Cooling air integration

Mission
system team

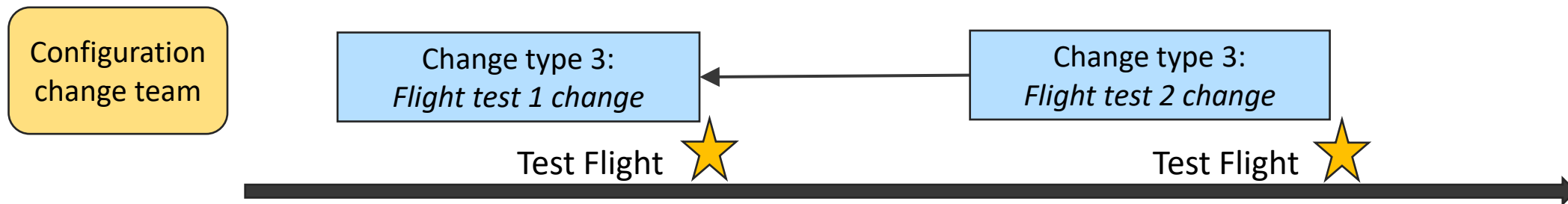
Change type 2:
Equip. communication

Change type 2:
Tactical interfacing

Change type 2:
Short-range performance

Change type 2:
Tactical registration

Configuration Planning (initial), change types 3



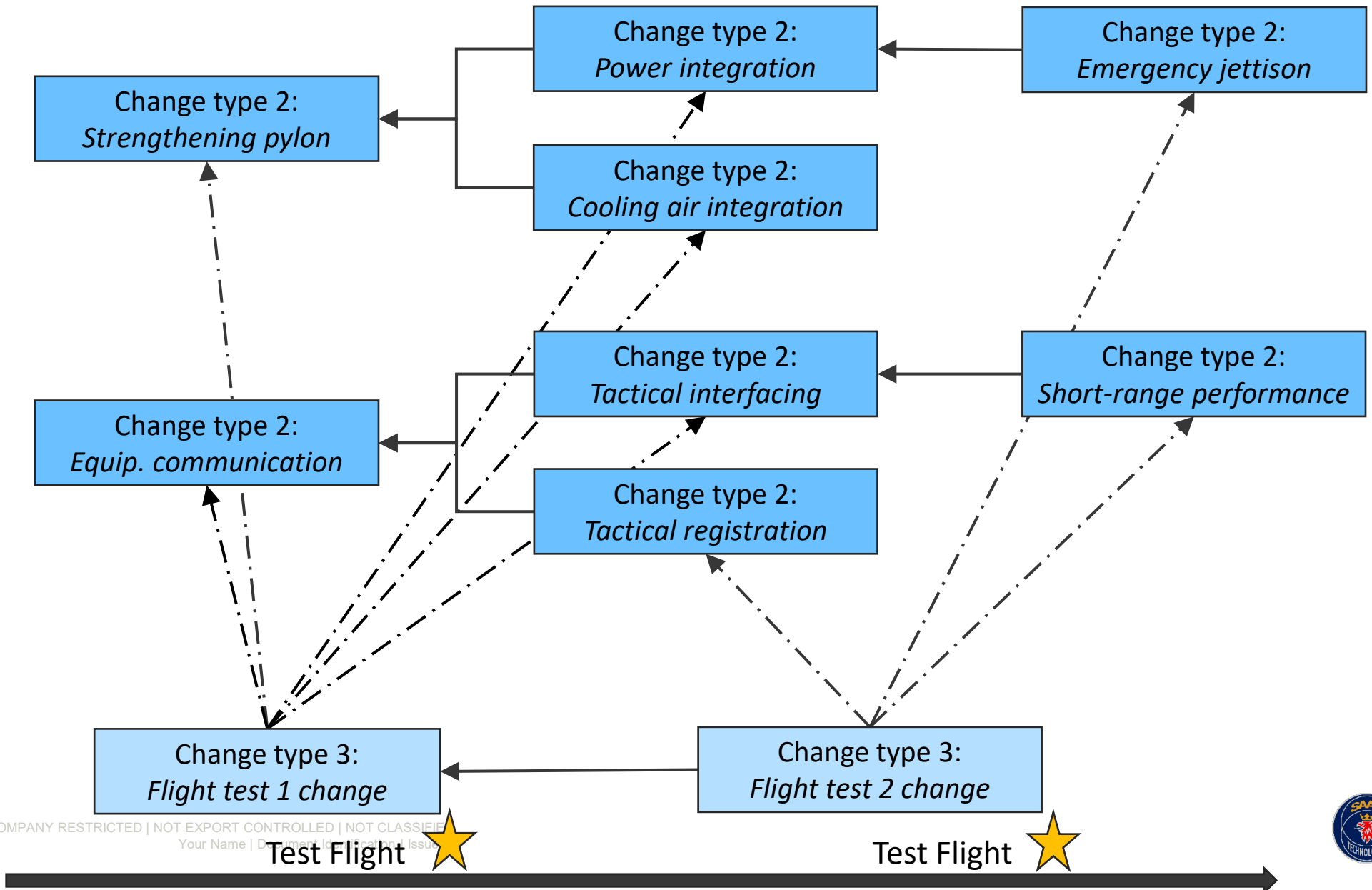
Configuration Planning (initial)



Weapons integration team

Mission system team

Configuration change team



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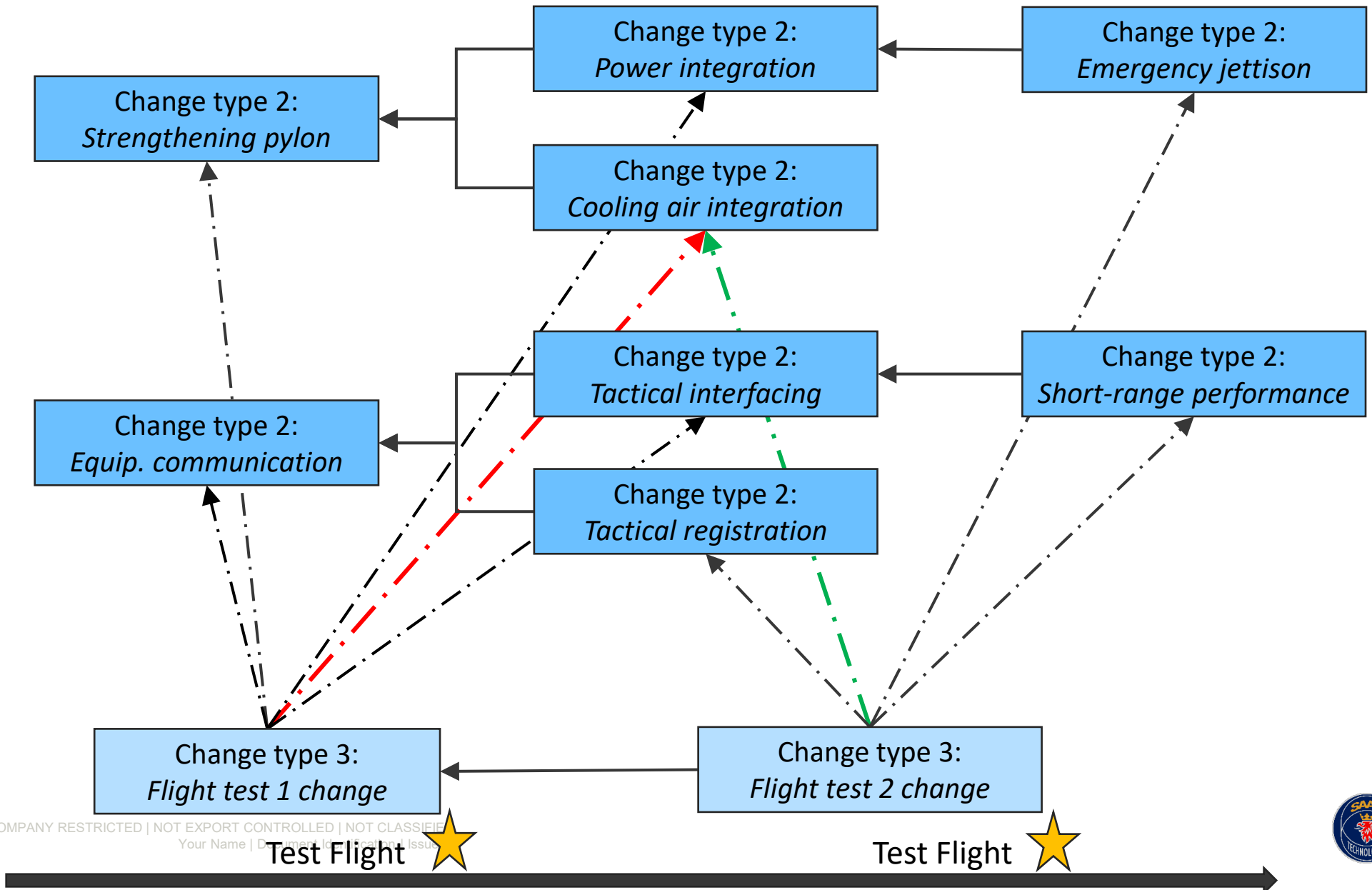
Configuration Planning (initial, replanning)



Weapons integration team

Mission system team

Configuration change team



Conclusions

Conclusions

- At Saab Aeronautics, contemporary Configuration Management practise is poorly aligned with Systems Engineering practise
 - As a consequence Configuration Management is viewed as a rigid administrative add-on
- Our proposal is to extend the Configuration Management vocabulary to three distinct Change types:
 - Distinct scopes
 - Adapted for the change time frames
 - Considering the dynamics of each change
 - Tailored Configuration Control Boards
- This will allow for a more focused and distributed approach to Configuration Management and Complex systems development
- All engineers (and project managers) need to have an understanding of Configuration Management