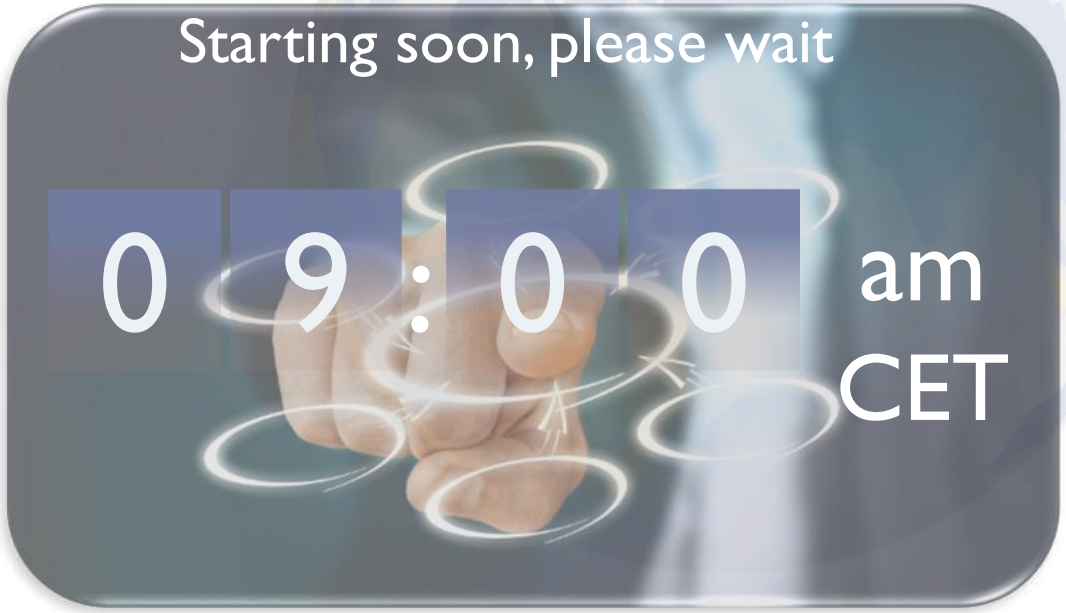


- Webinar rules:
  - You'll be muted all along the Webinar
  - There's a *Question* section to ask your questions or send your comments when you want
  - The Webinar will be recorded. A link to the recording will be sent to you in few days

Configuration Management in SES ENGINEERING Studio:

"From a tool-centric to a life cycle-wide approach"

Ilyes Yousfi
Senior Key Account Manager
The REUSE Company
ilyes.yousfi@reusecompany.com

Cecilia Karlsson
Marketing & Communication
The REUSE Company
cecilia.karlsson@reusecompany.com

THE REUSE COMPANY

- Introduction to The REUSE Company and the speaker
- Introduction and context of Configuration Management (CM)
- Holistic CM for complex systems
- Configuration management in SES ENGINEERING Studio
- Live demo
- Q&A

The REUSE Company:

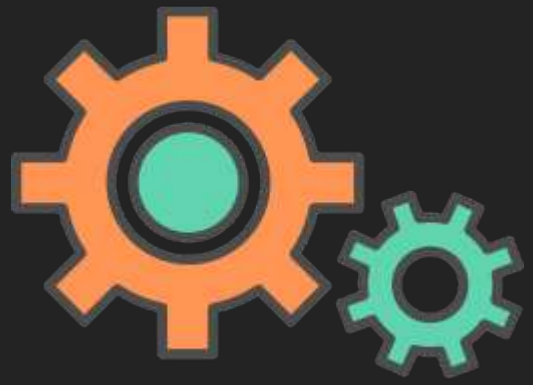
- specialized in the application of reuse methods,
- semantic technologies and artificial intelligence,
- digitalization of the Systems Engineering lifecycle.

"We promote lifecycle management methodologies guided by REUSE, based on a knowledge-centric approach, supporting the notion of authoritative source of truth, offering connectivity to everything, unlimited interoperability,
and providing full support to technical management as in ISO 15288"

- RQA – QUALITY Studio
- RAT – AUTHORING Tool
- TRACEABILITY Studio
- V&V Studio
- KM – Knowledge Manager
- SES ENGINEERING Studio

Ilyes Yousfi

- **Current position:** Senior Key Account Manager at The REUSE Company
- Master's degree from the University of Montreal (Canada) and the IMT Atlantique School of Engineering (France).
- 7 years of experience in sales, technical background in energy and mechanical engineering
- Involved in a research project around the environmental impacts of end-of-life management of aircrafts (2014)
- Consulting services to help industry actors leverage and digitalize Systems Engineering activities.
- Passionate about international projects and learning languages, Ilyes speaks 4 languages fluently: English, French, German and Spanish.



Introduction to

Configuration Management

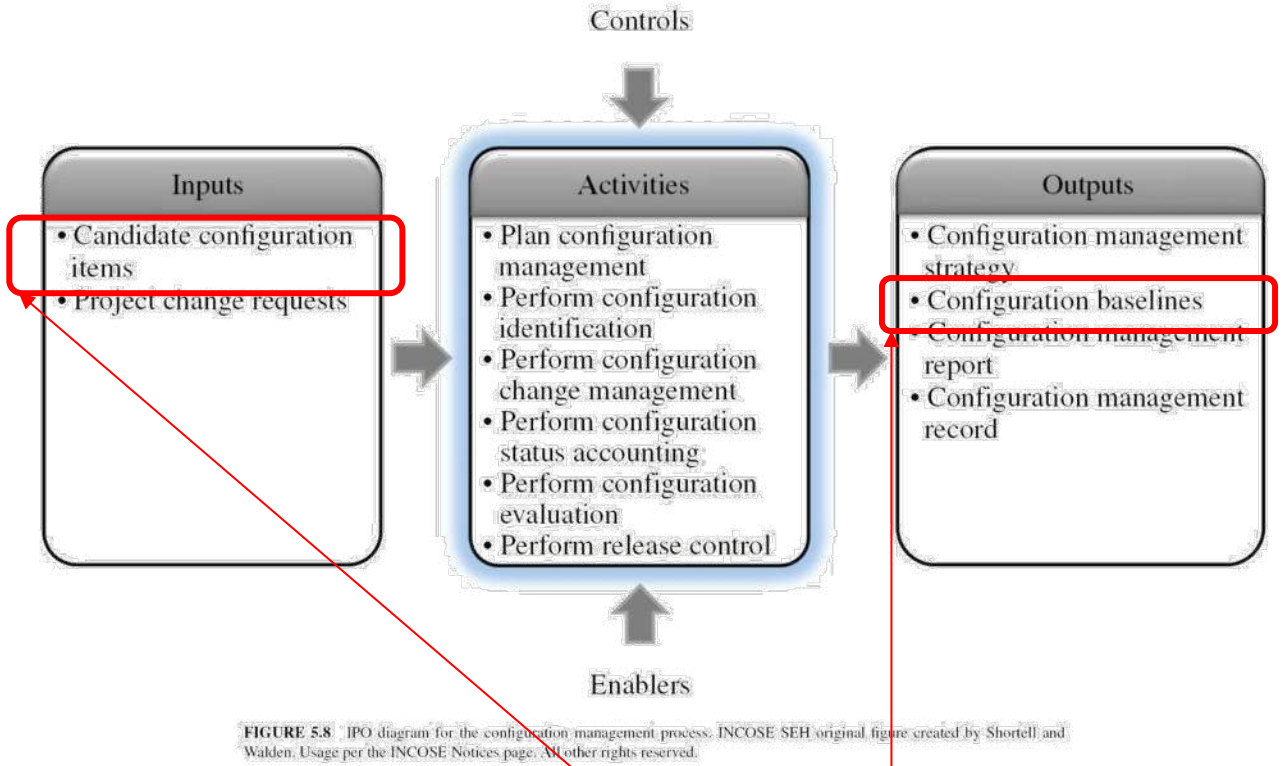


FIGURE 5.8 IPO diagram for the configuration management process. INCOSE SEH original figure created by Shortell and Walden. Usage per the INCOSE Notices page. All other rights reserved.

Source: INCOSE Systems Engineering Handbook

(ISO 15288)

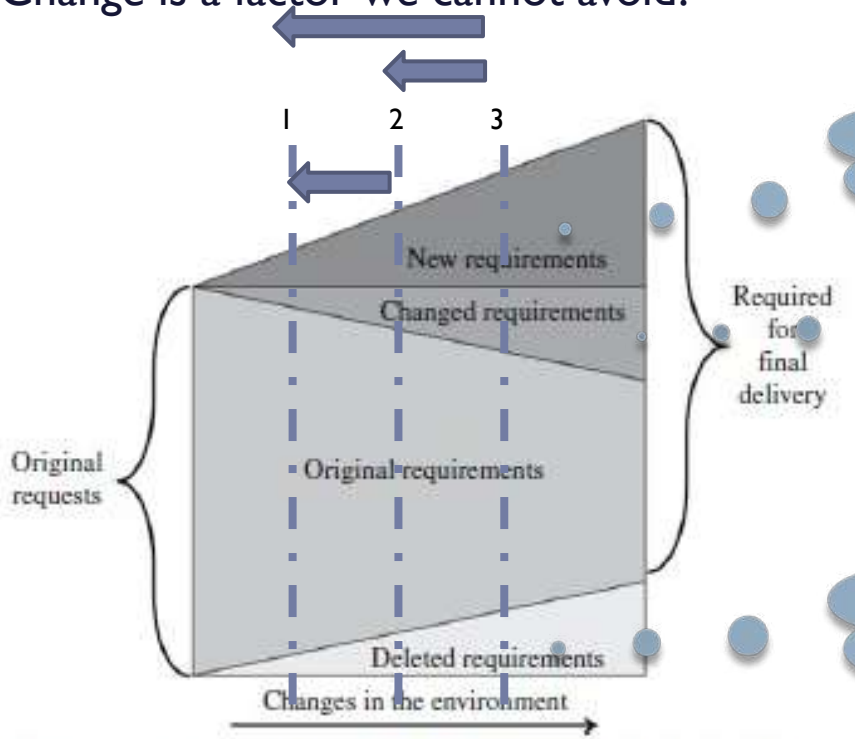
"The purpose of Configuration Management is to manage and control system elements and configurations ***over the life cycle****. CM also manages* ***consistency*** *between a product and its associated configuration definition".*

(EIA-649)

Process that establishes and maintains ***consistency*** *of a product's attributes with its requirements and product configuration information* ***throughout the product's life cycle***

Items designated at any stage of the life cycle to produce **baselines** of the system configurations

- Key process to mitigate the risks of change
  - Change is a factor we cannot avoid!



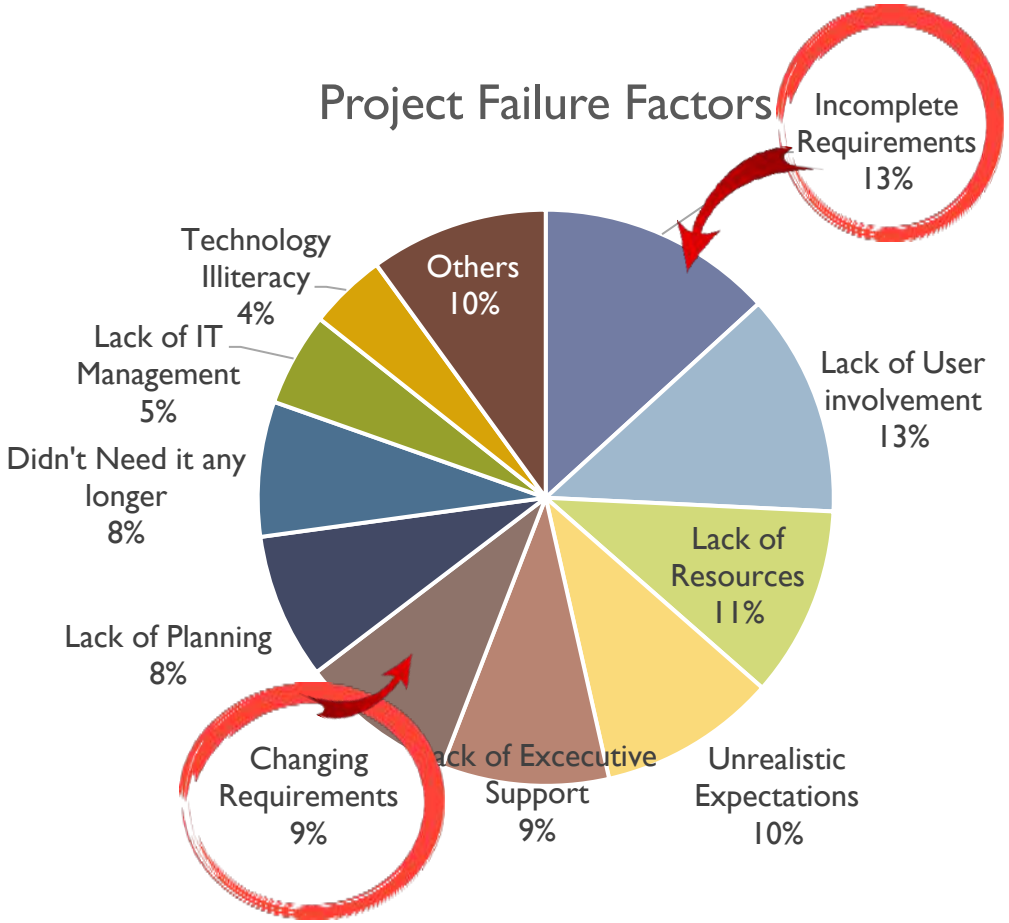
Are these new requirements necessary?

Am I introducing conflicts?

May this new version underspecify the system?

FIGURE 5.9 Requirements changes are inevitable. Derived from (Forsberg et al., 2005) Figure 9.3. Reprinted with permission from Kevin Forsberg. All other rights reserved.

- Be careful with **changes & requirements!**

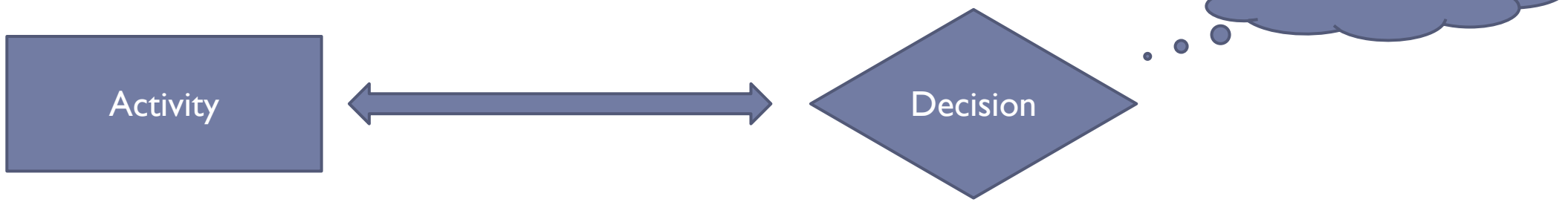


Configuration Management at Life Cycle level

- If CM is applied by identifying the relevant items throughout the life cycle...
  - Impacts of change are appropriately controlled
  - Threat -> Opportunity (change out of surprise -> anticipated change)

BUT...

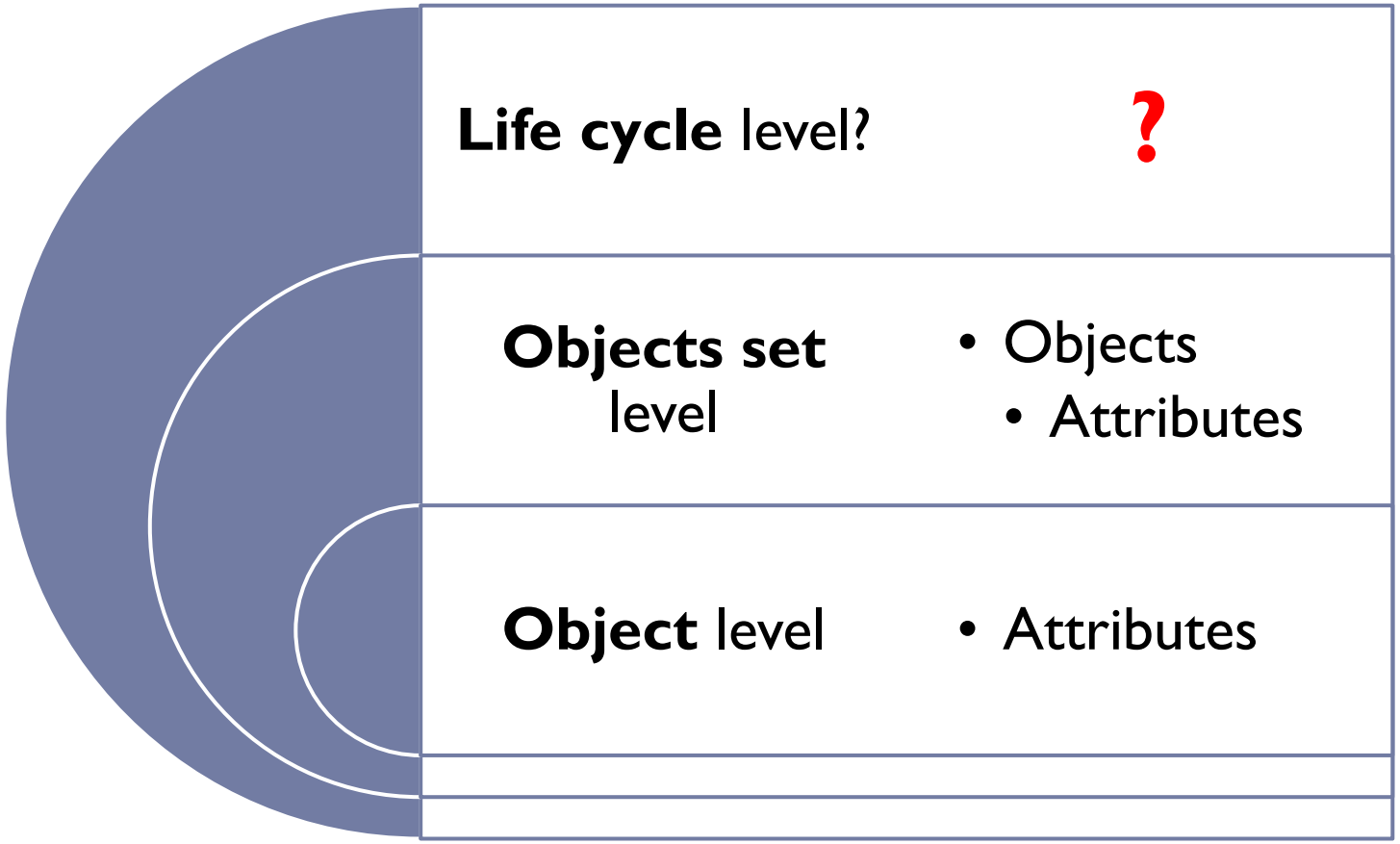
- **Complex** System Development = **Complex** monitoring of change impact
- Interaction with Decision & Risk Management:

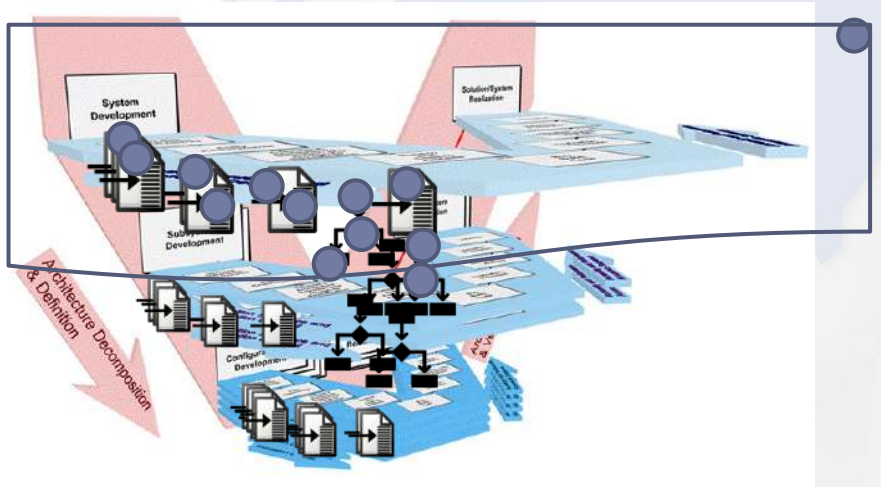


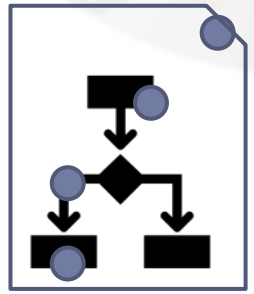
- Change in 1 activity impacts **several decisions** over the life cycle
- 1 decision might impact **several activities** over the life cycle

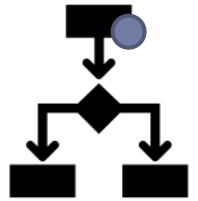
Need for a holistic approach of Configuration Management

- CM process levels

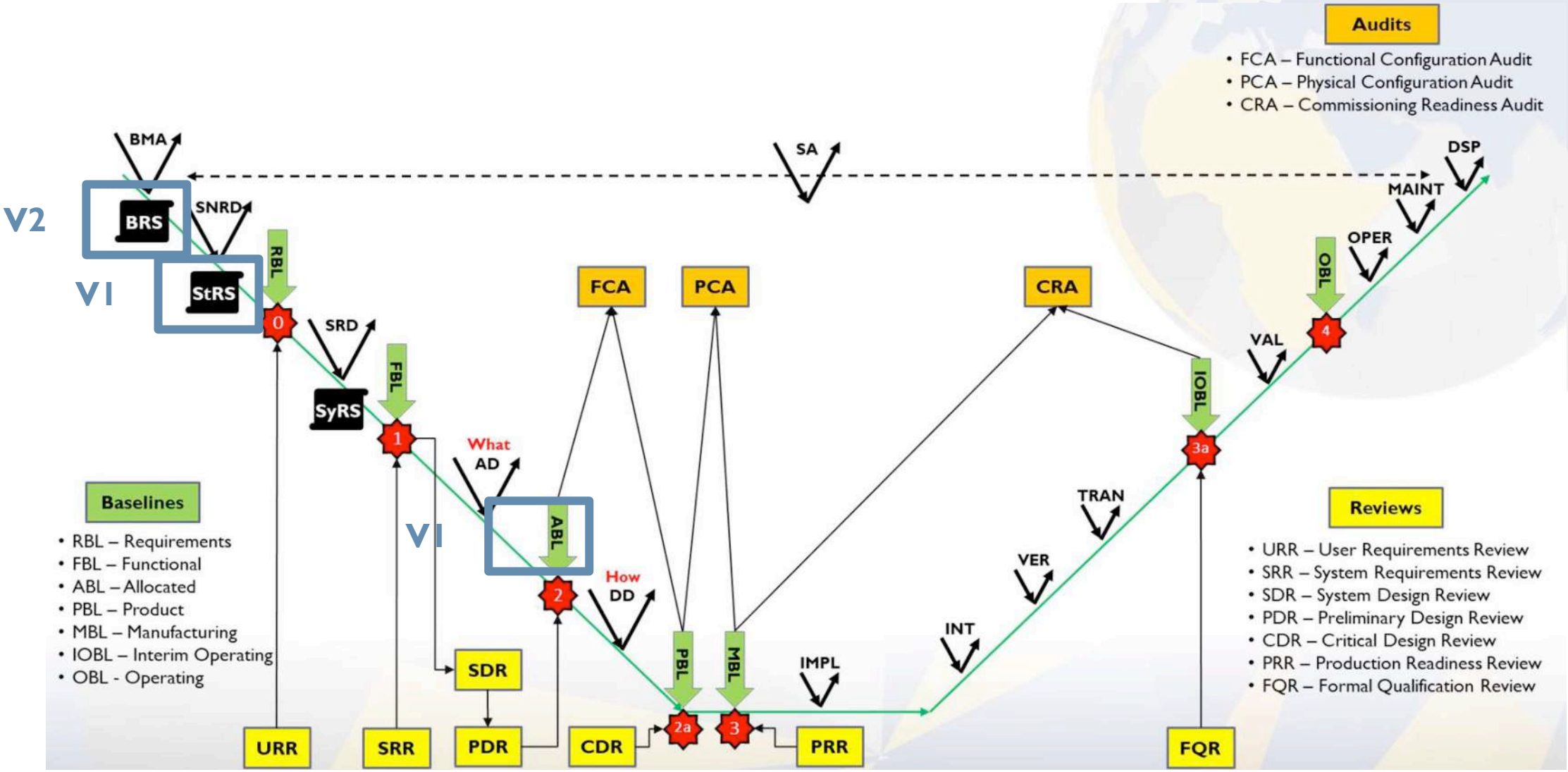




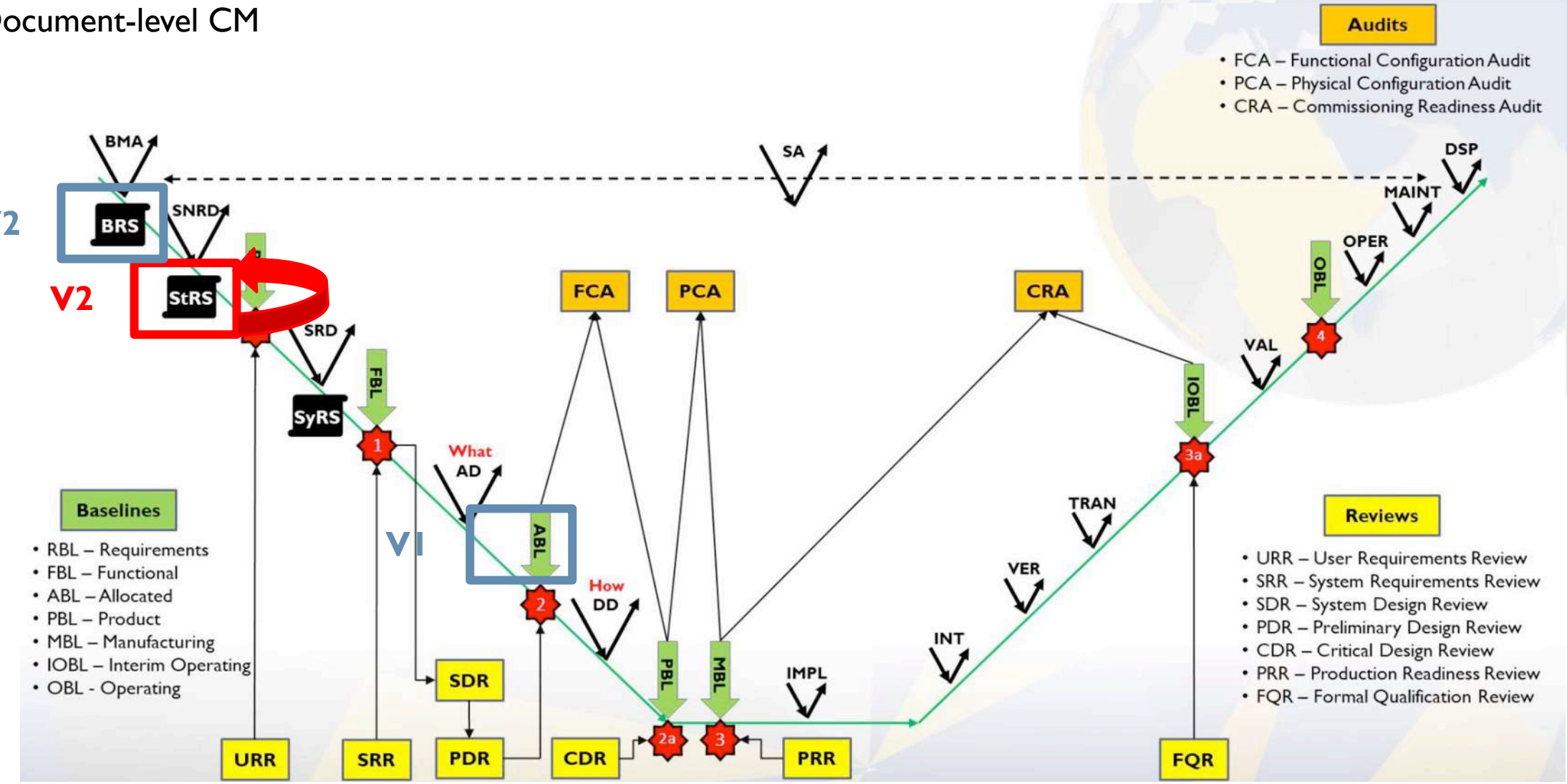




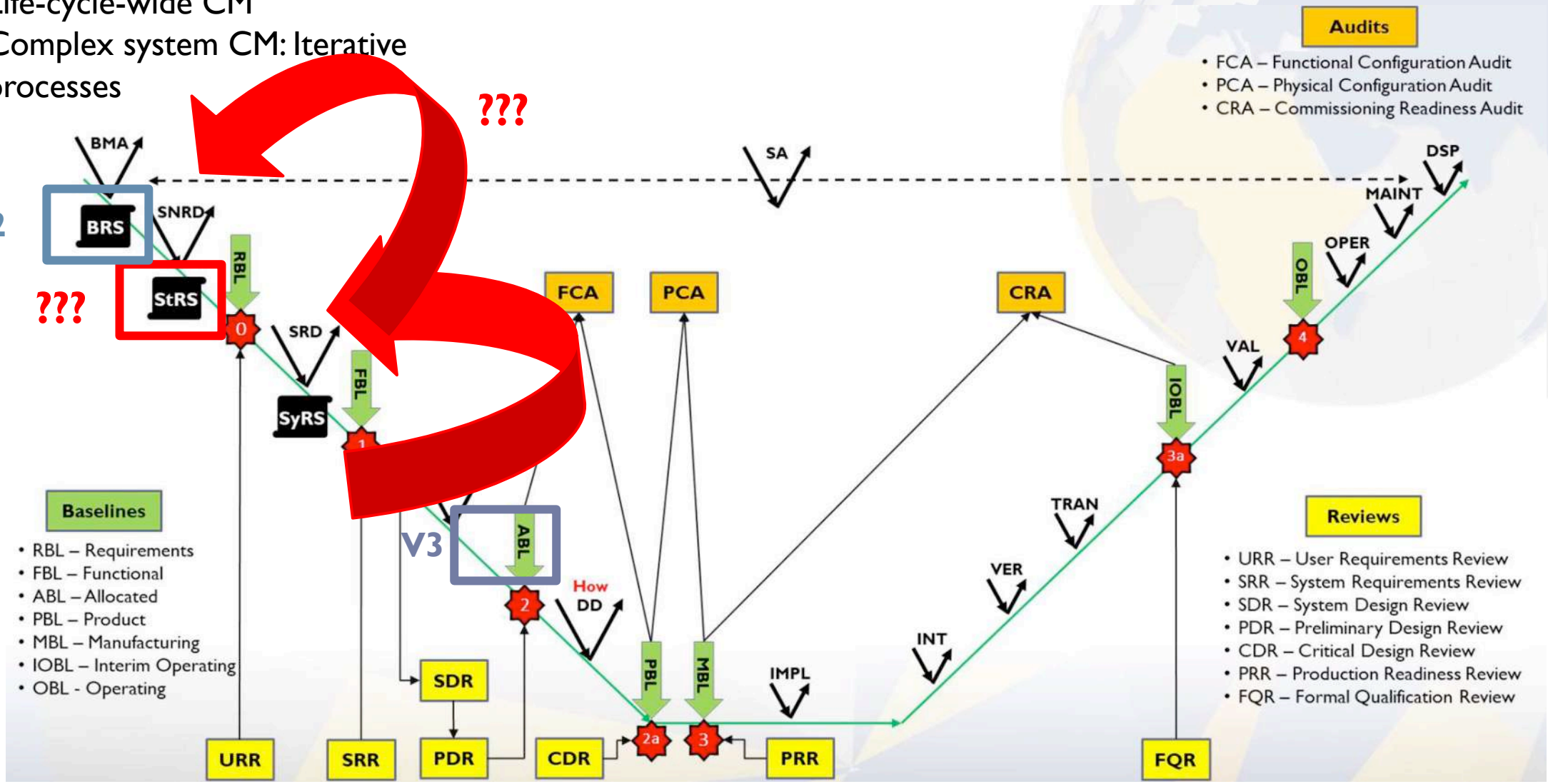
2. Configuration Management at Life Cycle level



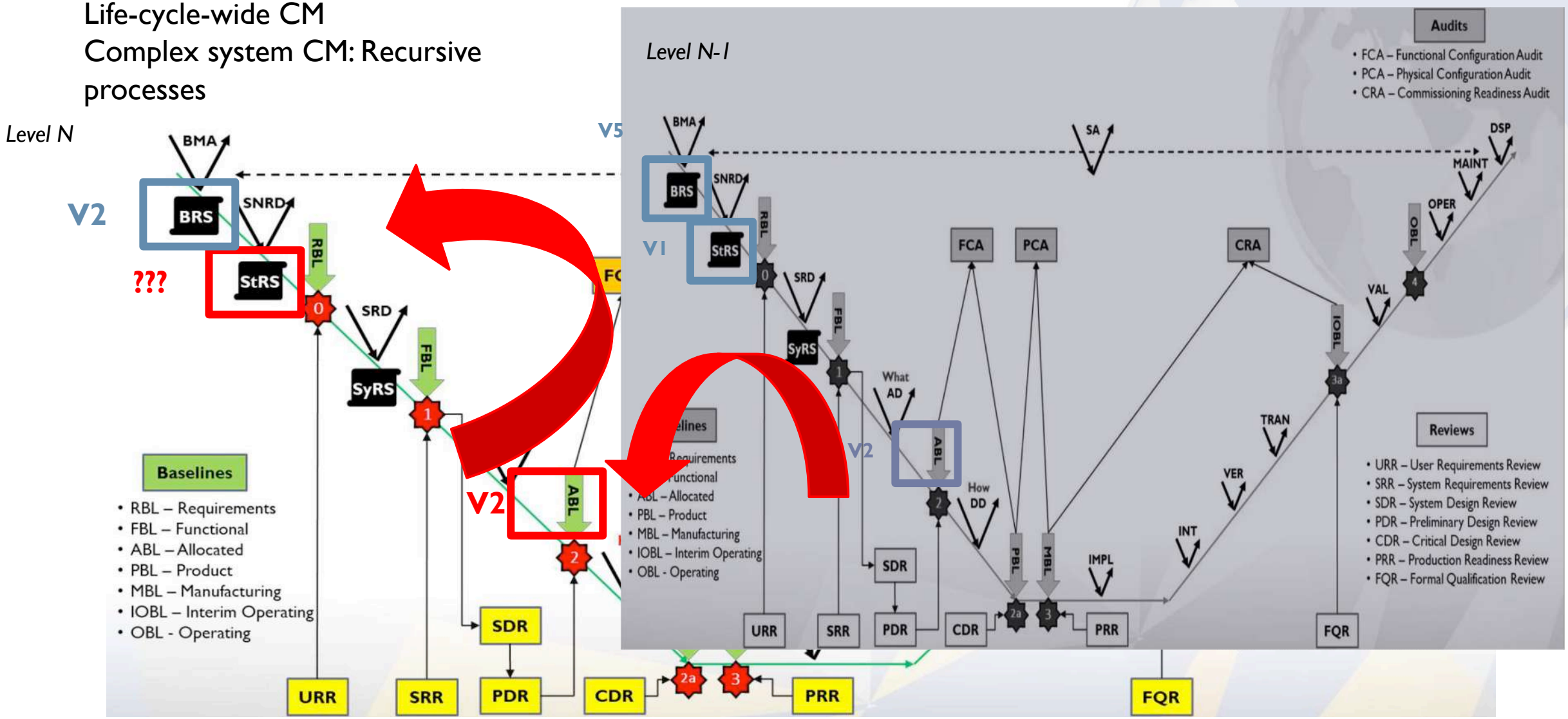
Document-level CM



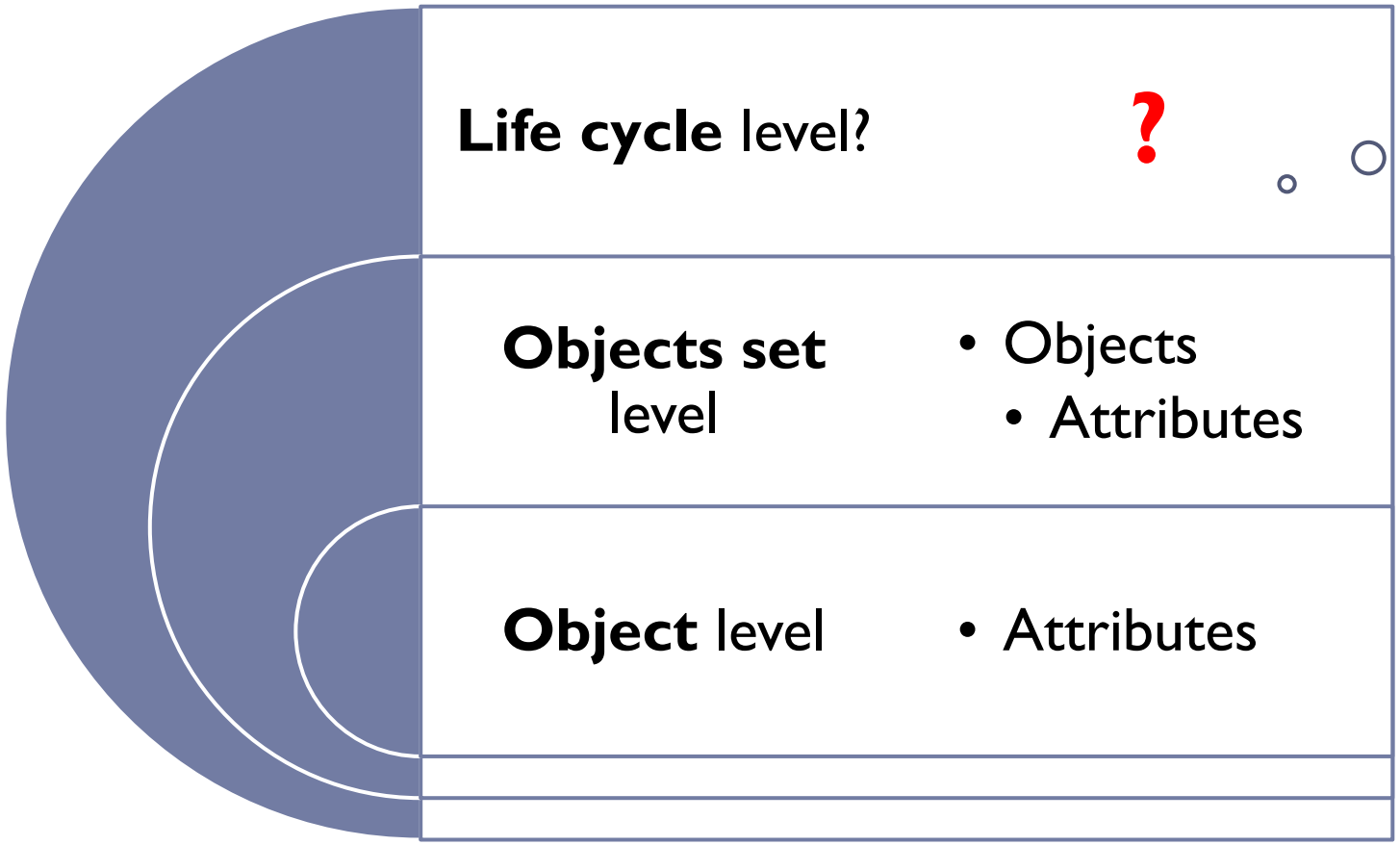
Life-cycle-wide CM
Complex system CM: Iterative processes

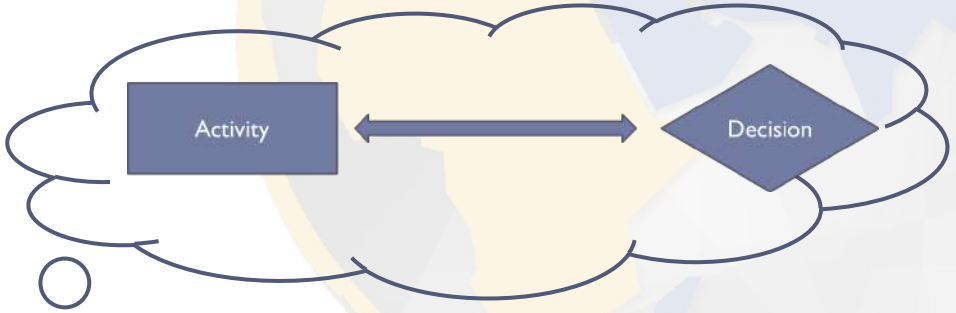


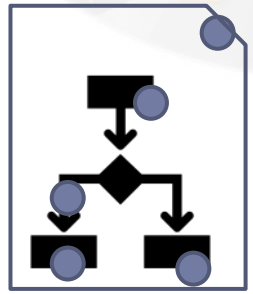
Life-cycle-wide CM
Complex system CM: Recursive processes

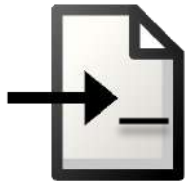


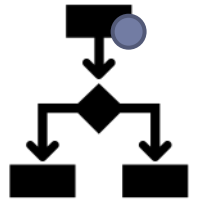
- CM process levels



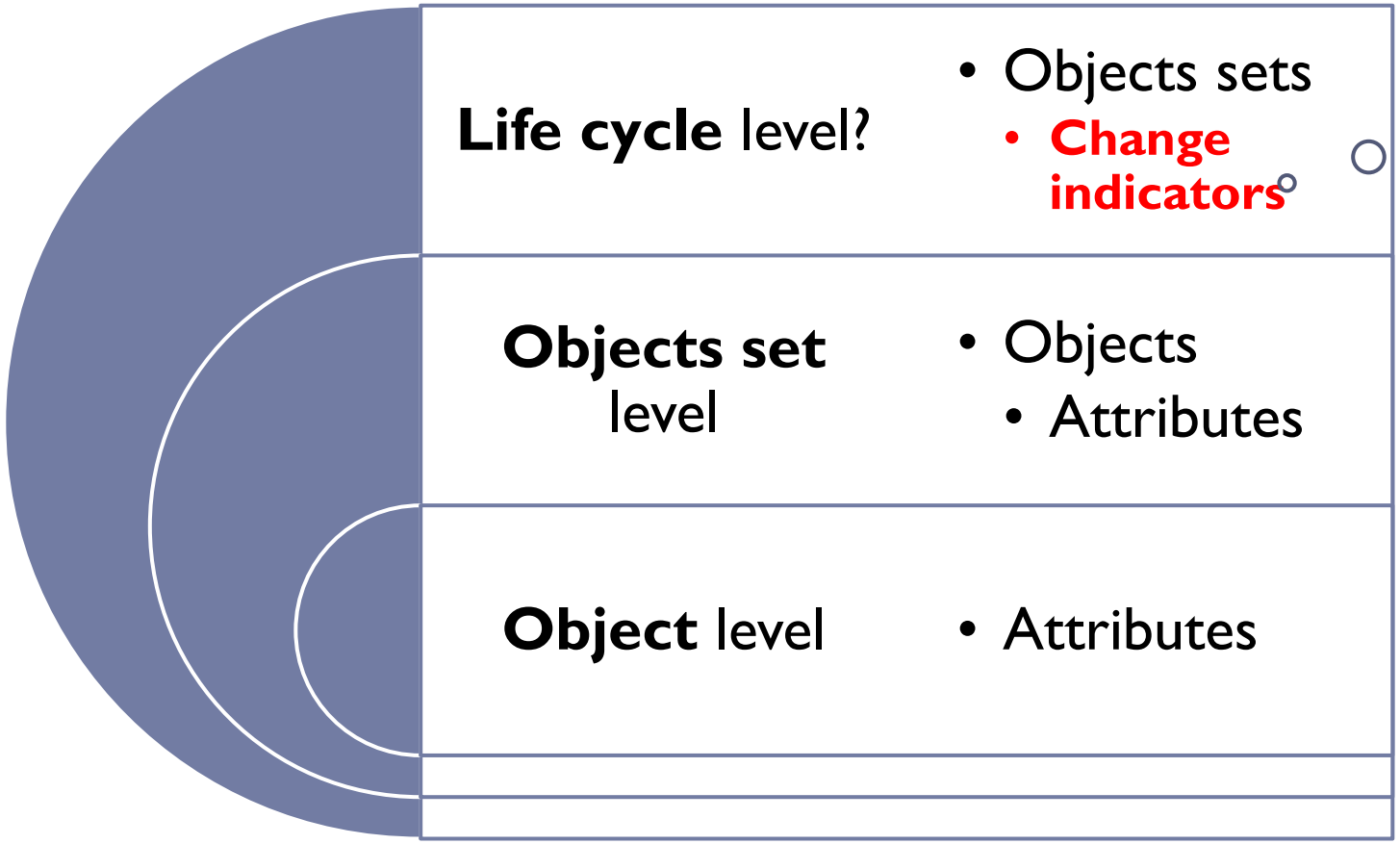


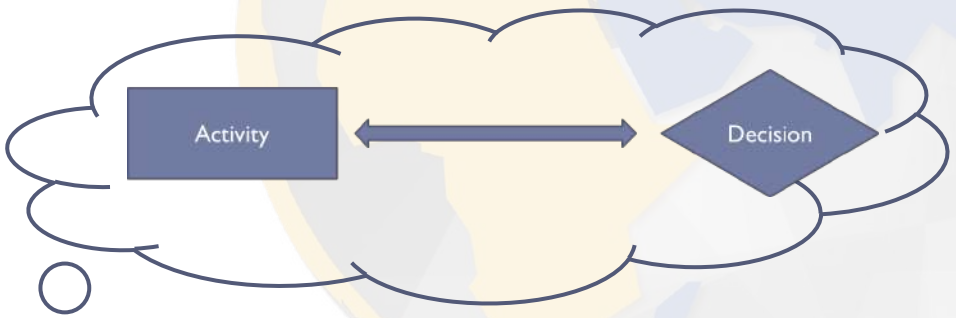


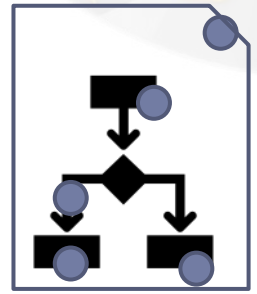


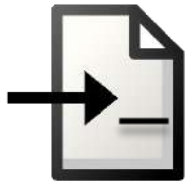


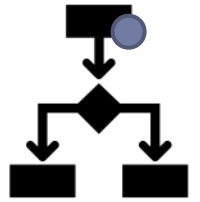
- CM process levels



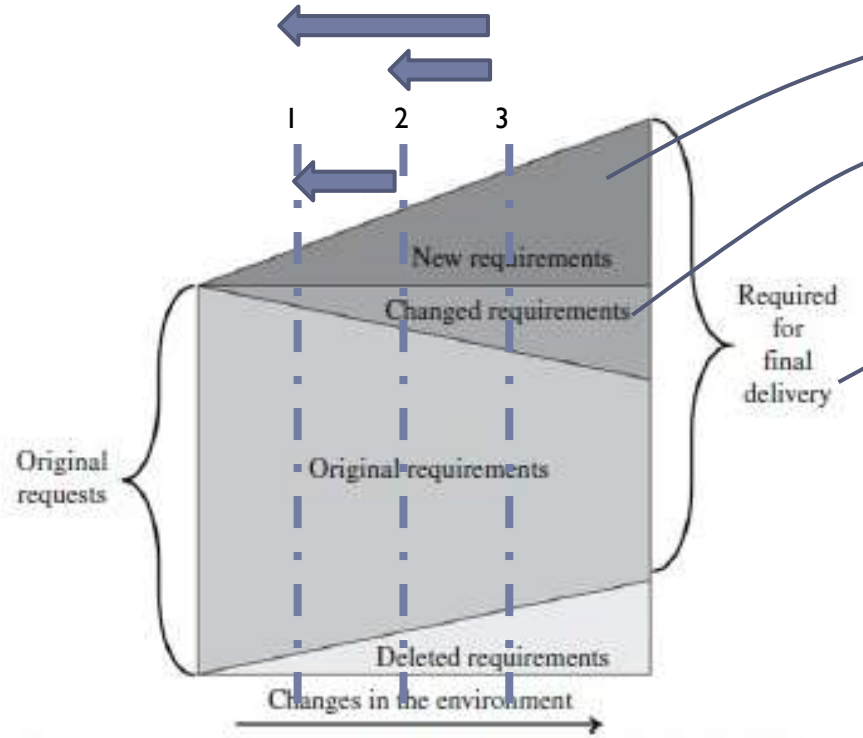








- Life Cycle Change indicators → Life Cycle KPIs



Traceability

Verification & Validation

Quality

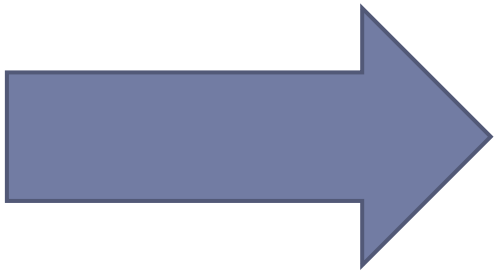
Untraced requirements ? (Orphans)

Am I still fulfilling system requirements (Ver.) & fulfilling stakeholder needs (Val.)

Are the requirements / models specified properly ? (characteristics)

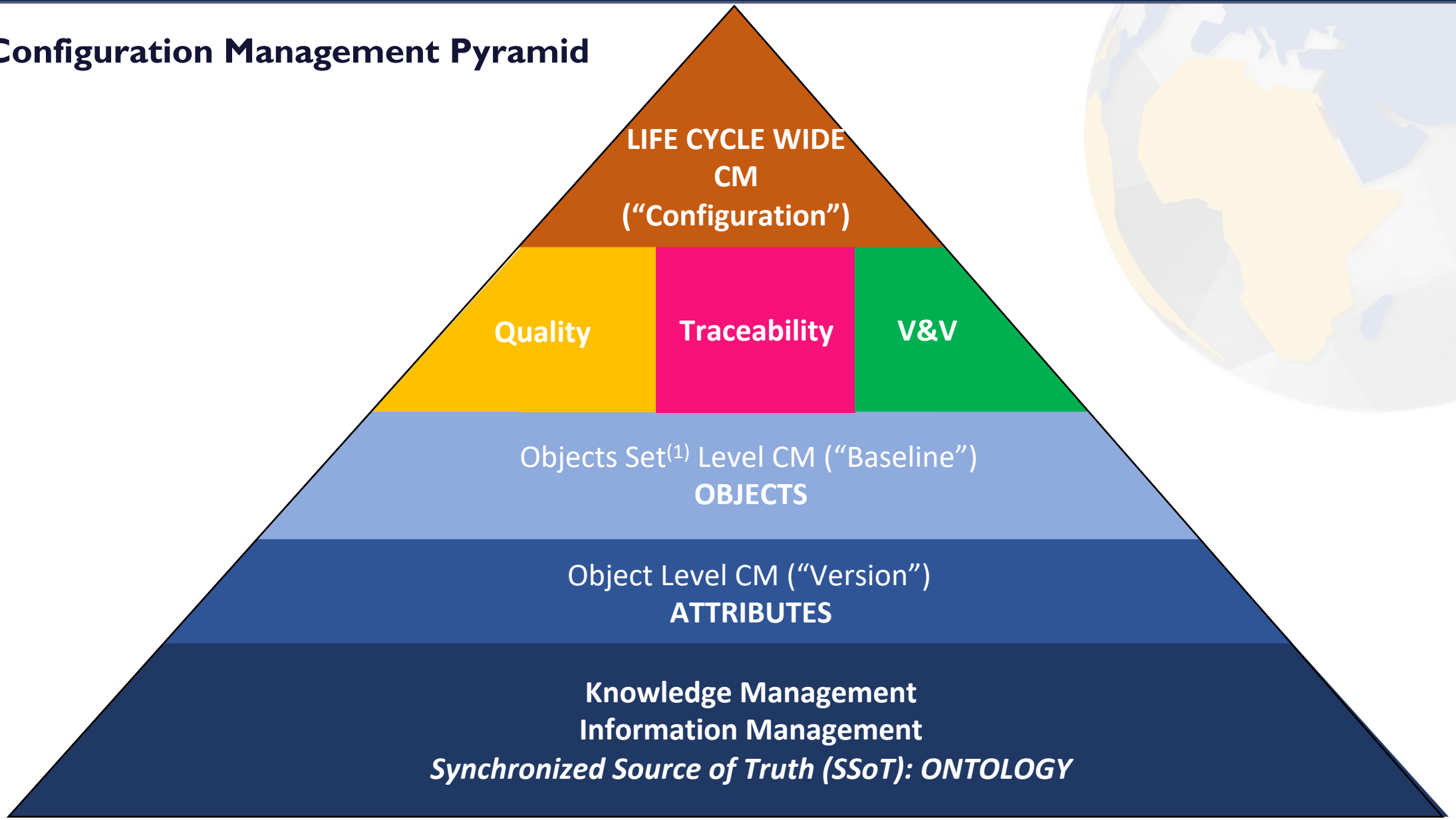
FIGURE 5.9 Requirements changes are inevitable. Derived from (Forsberg et al., 2005) Figure 9.3. Reprinted with permission from Kevin Forsberg. All other rights reserved.

- **Quality** Indicators
  - % high/medium/low-quality rated work products
  - % attributes specified
  - % properties defined
- **Traceability** Indicators
  - % missing traces (by trace type)
  - % suspect links
  - Automated / manual traceability ratio
  - Traceability Matrix
- **V&V** Indicators
  - % Verified/Not verified (Validated/Not validated) elements
  - # verification (validation) actions performed
  - Source elements coverage
  - ...



Activity Progress Indicators

Configuration Management Pyramid



Configuration Management Pyramid

Quality

Change in internal procedures or standards/regulations might affect quality assessment results and therefore impact decisions at life cycle.

Traceability

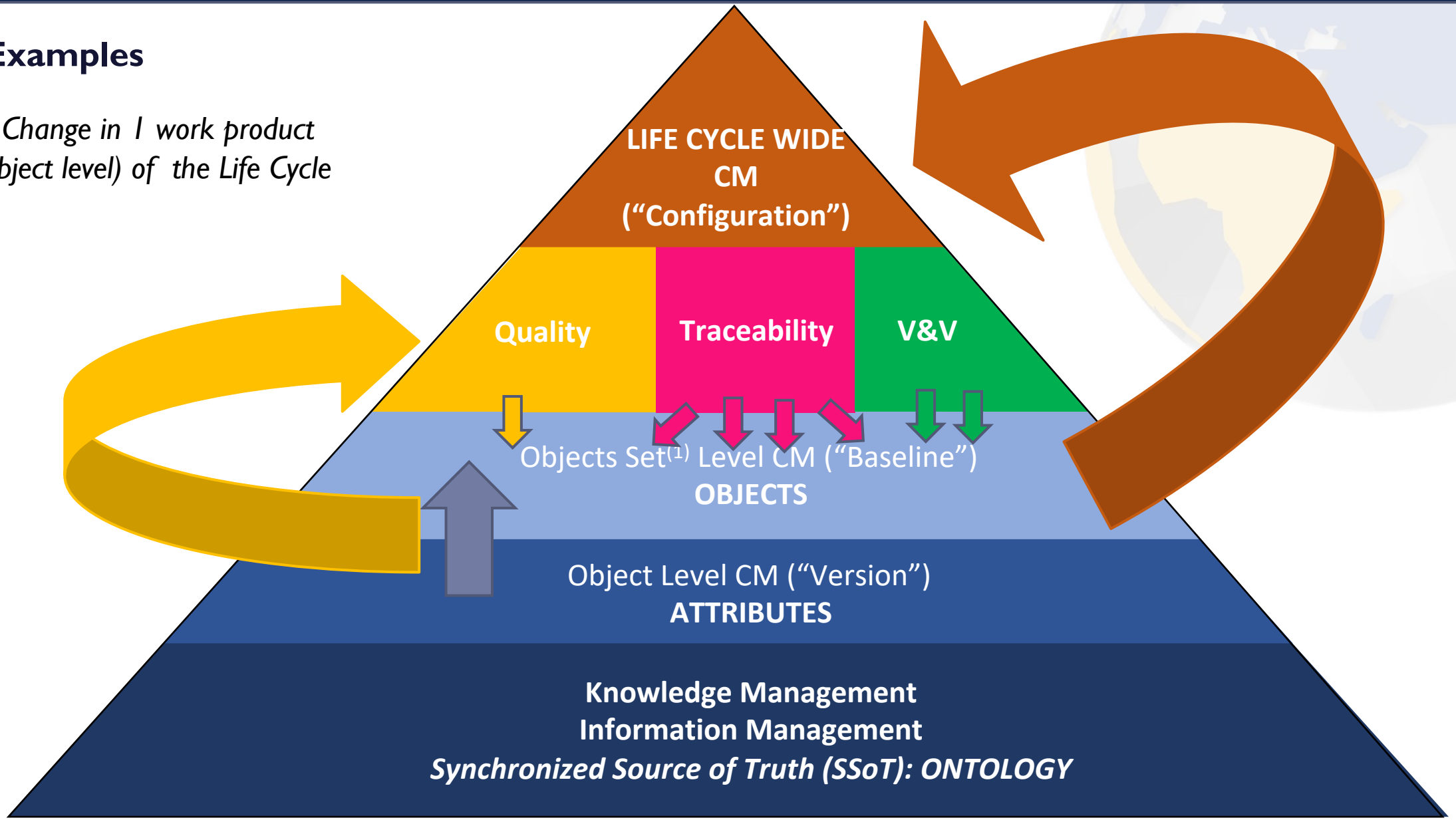
Ensures it maintains a 100% traceability between the work products to avoid orphan work products

V&V

Change in system requirements & stakeholder needs must be applied to the previously defined verification / validation actions.
Work product verification / validation to be updated.

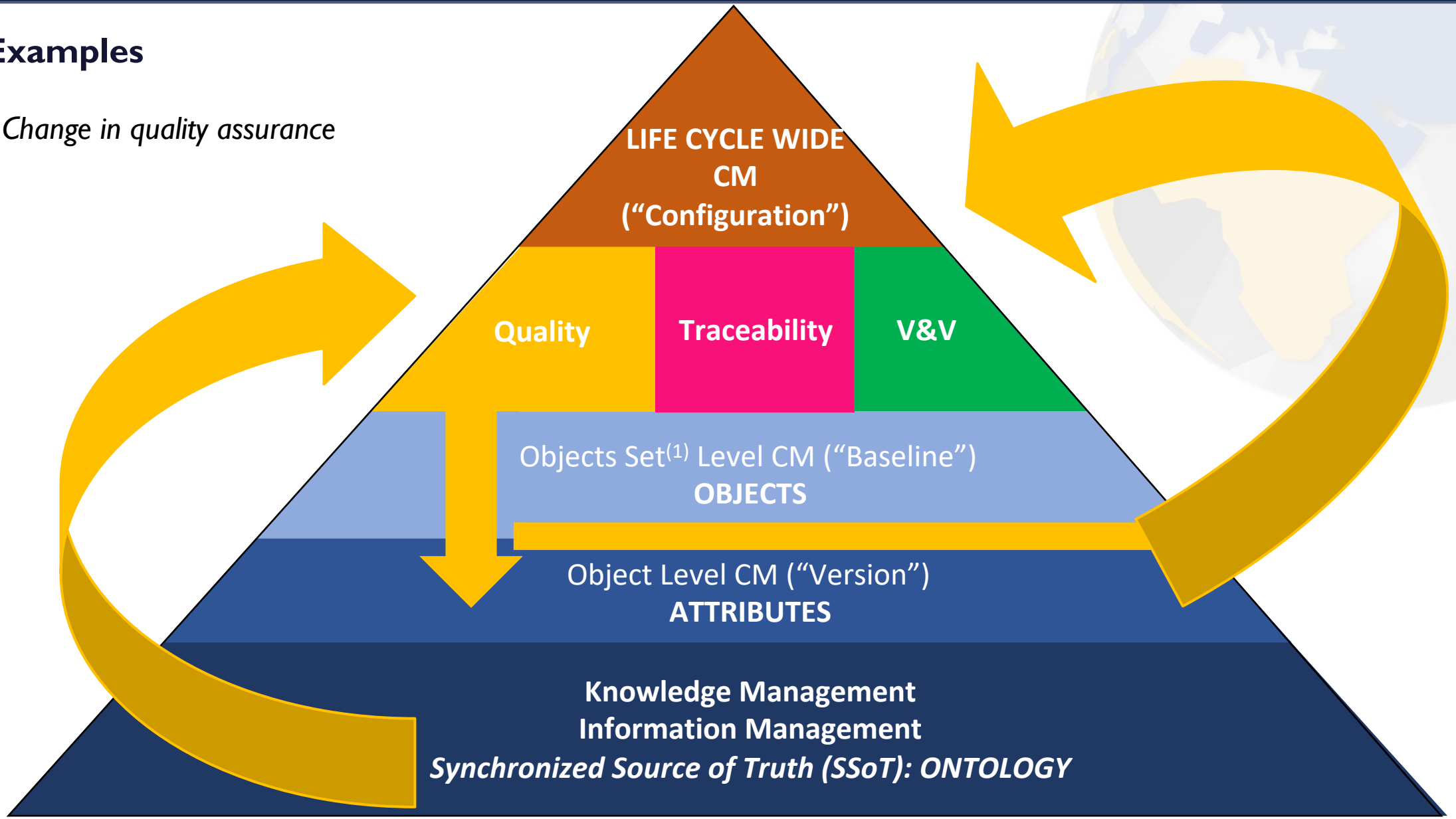
Examples

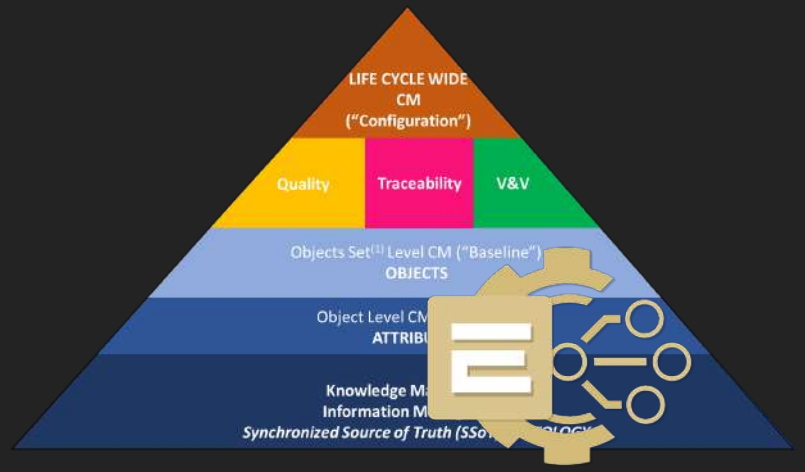
1. Change in 1 work product (object level) of the Life Cycle



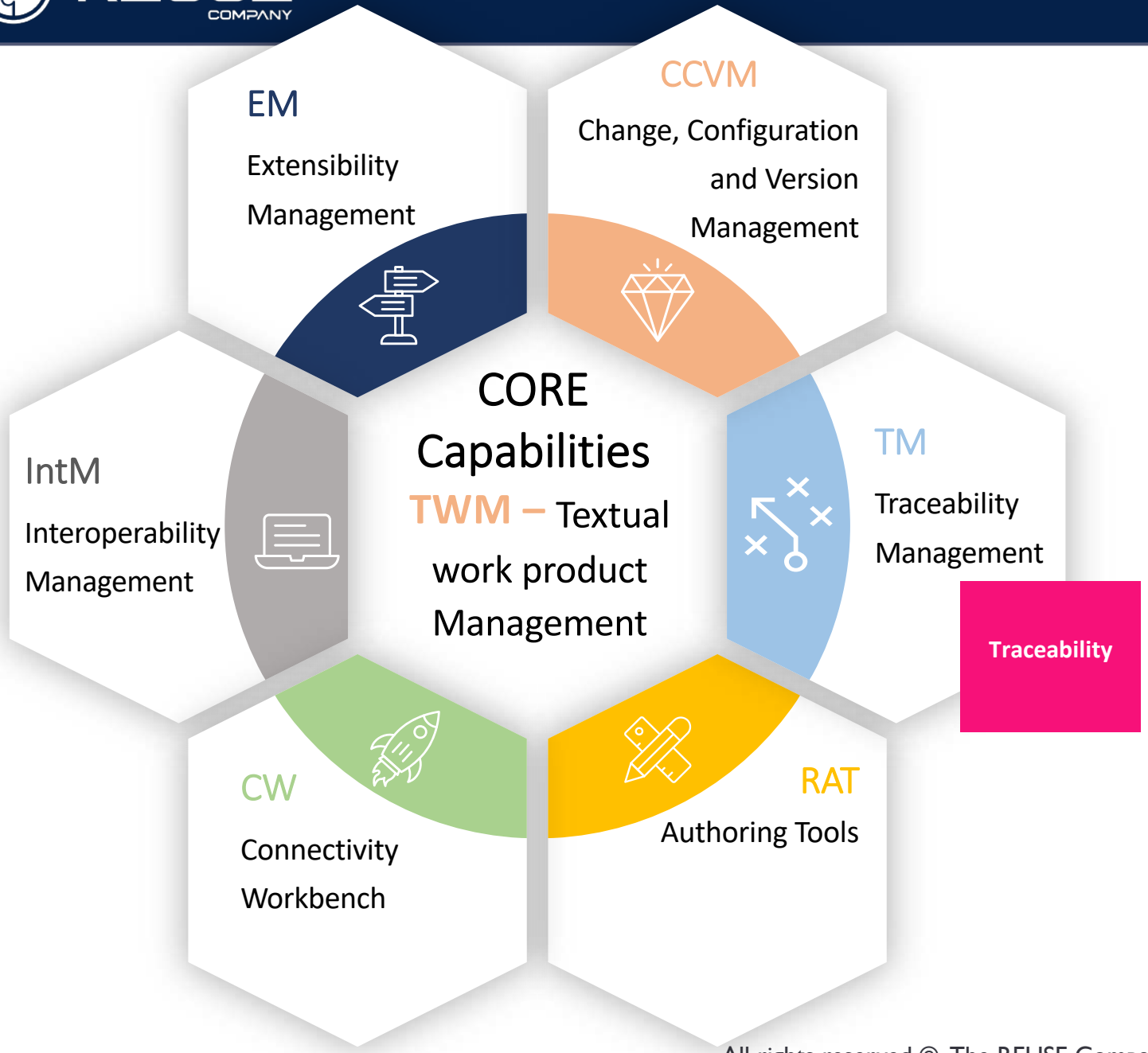
Examples

2. Change in quality assurance





CM approach in SES ENGINEERING Studio



Traceability

Additional Capabilities

V&V
V&V Management Capability

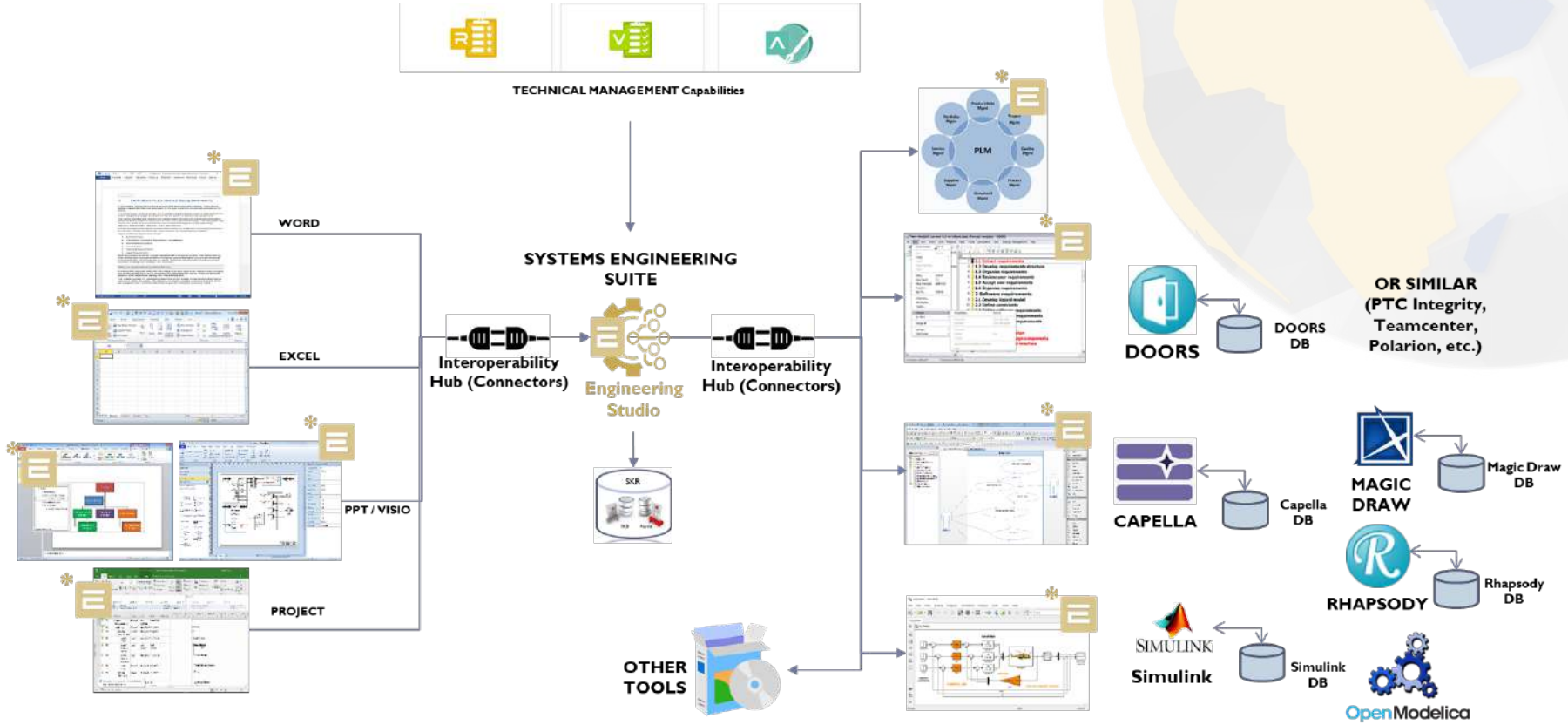
RQA
Quality Management Capability

SLC
Lifecycle Management Capability

V&V

Quality

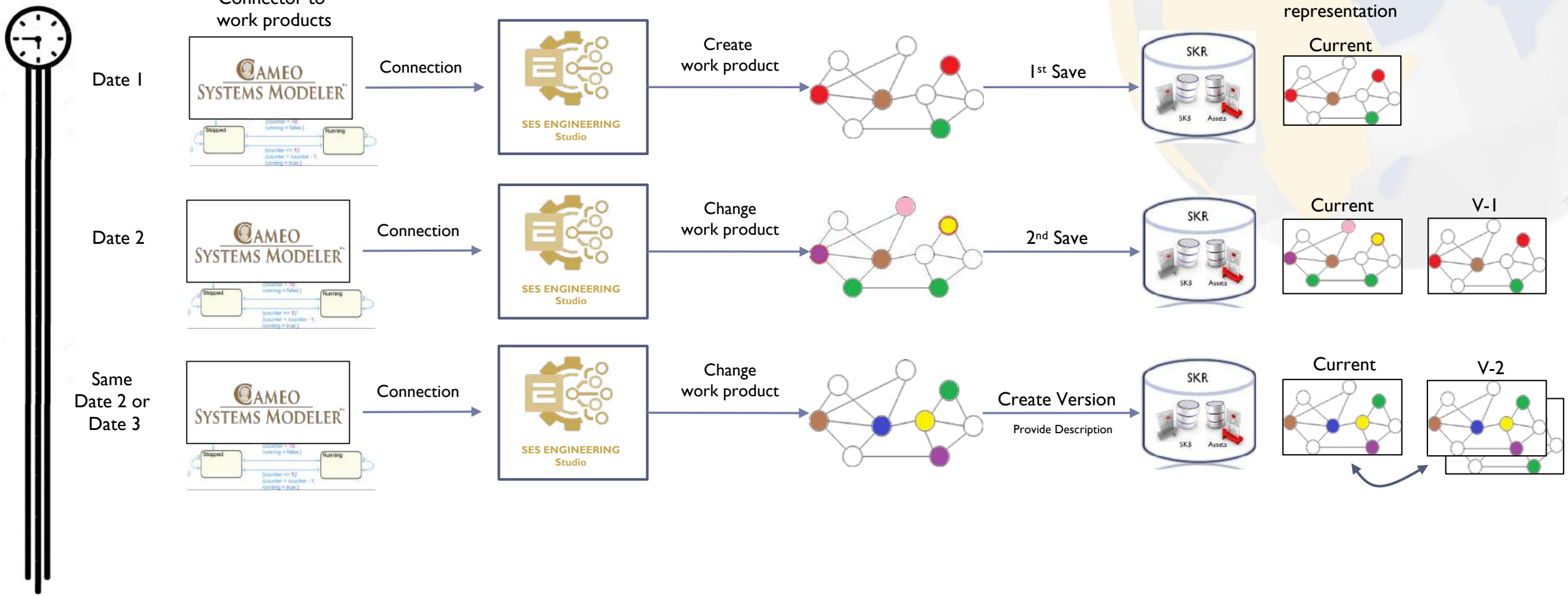
- SES ENGINEERING Studio = Multi-capability platform to perform SE activities across the system life cycle



- Main tool of the **Systems Engineering Suite (SES).**

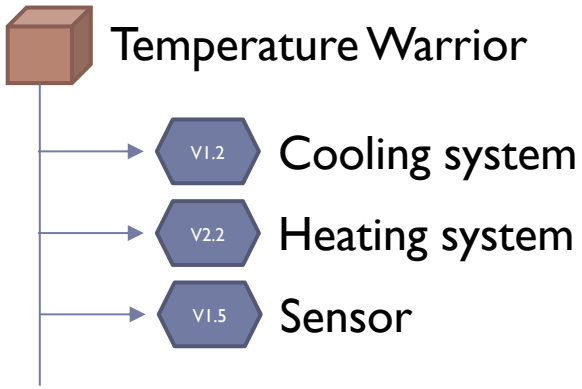
- Configuration Management Process (ISO15288, Project Processes)
- Configuration Management at Workproduct Level
  - Scope: 1 workproduct (1 req, 1 model, 1 test case, …)
- Cases where a new version is generated (automatic & manual):
  - Automatic: Whenever there are unsaved changes, and the user decides to save them.
  - Automatic: When including a workproduct within the Traceability system (creating a trace).
  - Manual: When a version is created by the user.
  - Manual: In Lifecycle Management, when a configuration is created and the inner elements have changes, with regards to their last version.
- Operations on top: Diff details, Revert to version.

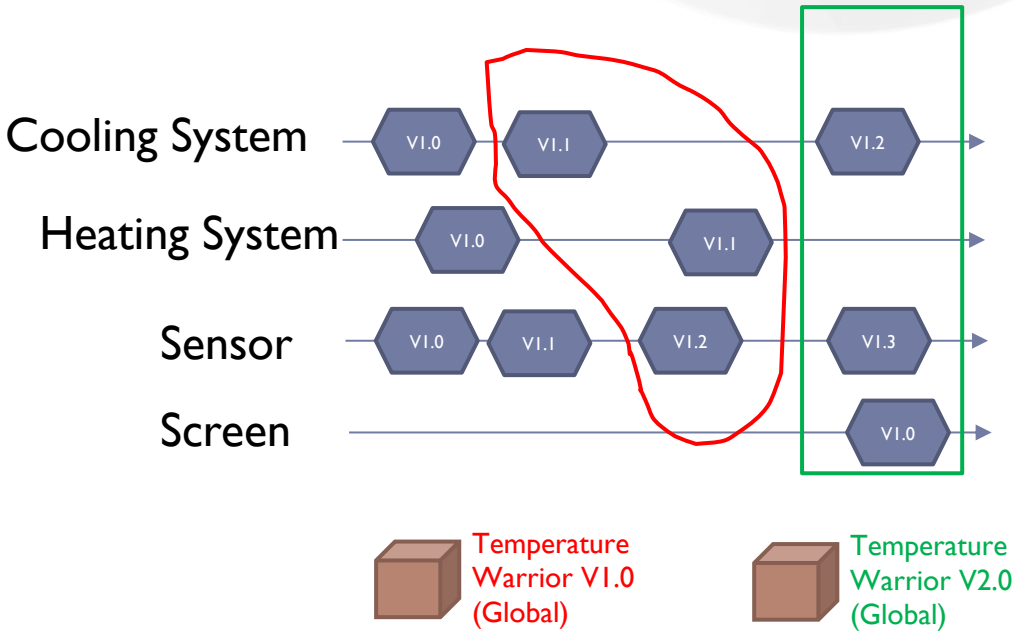
CM at Workproduct Level

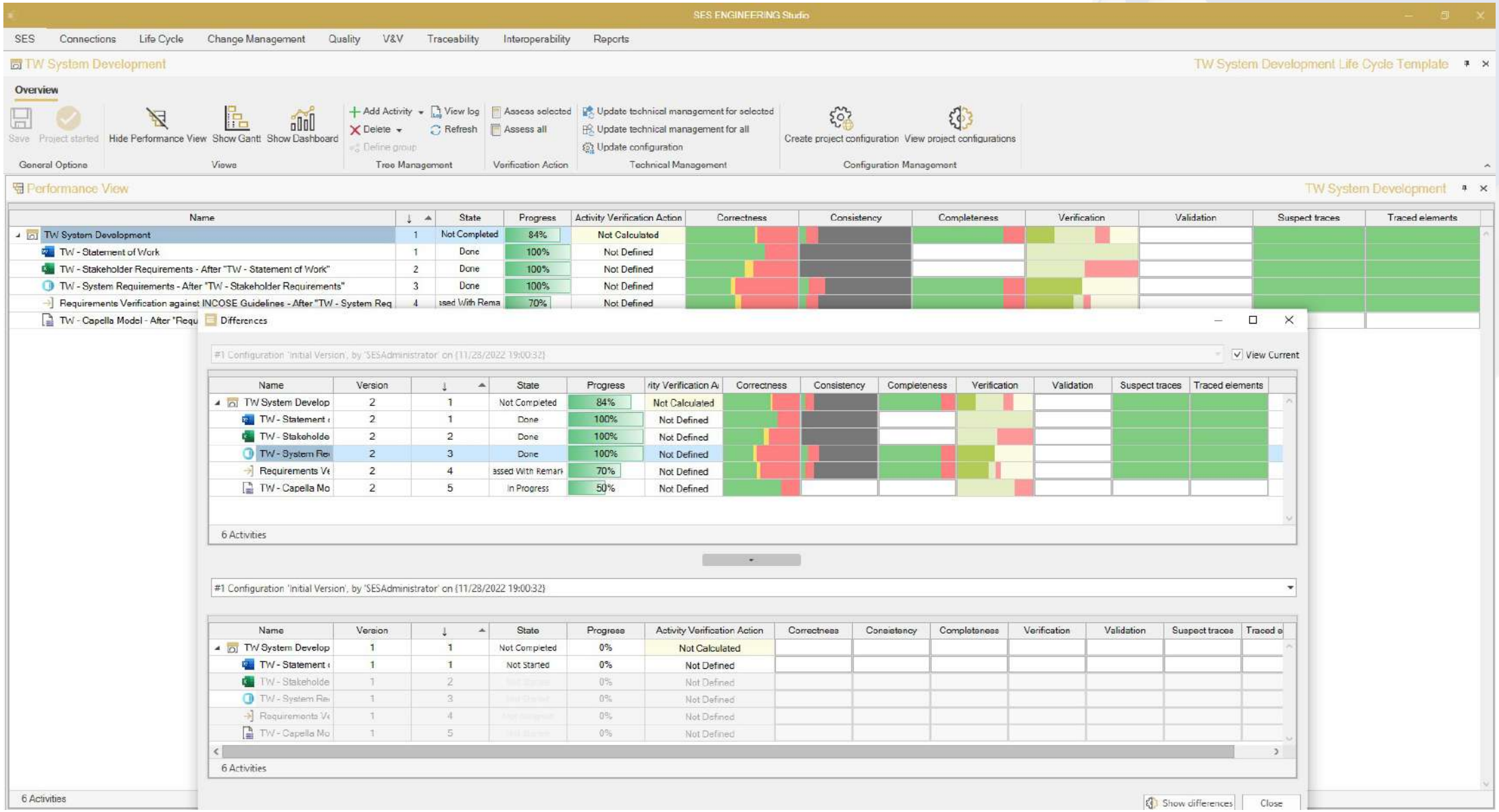


- Configuration Management Document / Project Level
- Baseline (Local)

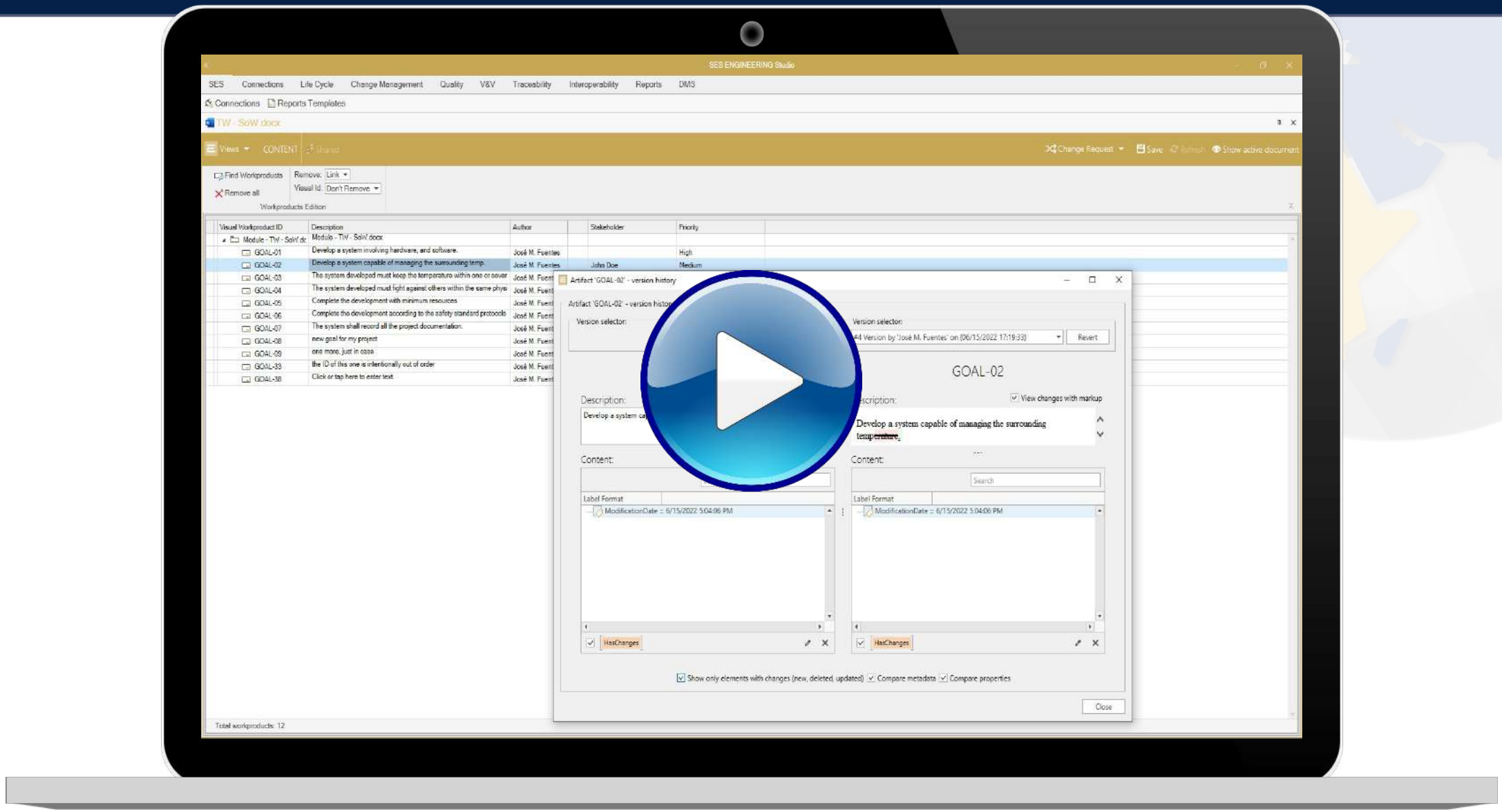
- Global Configuration (Life Cycle)





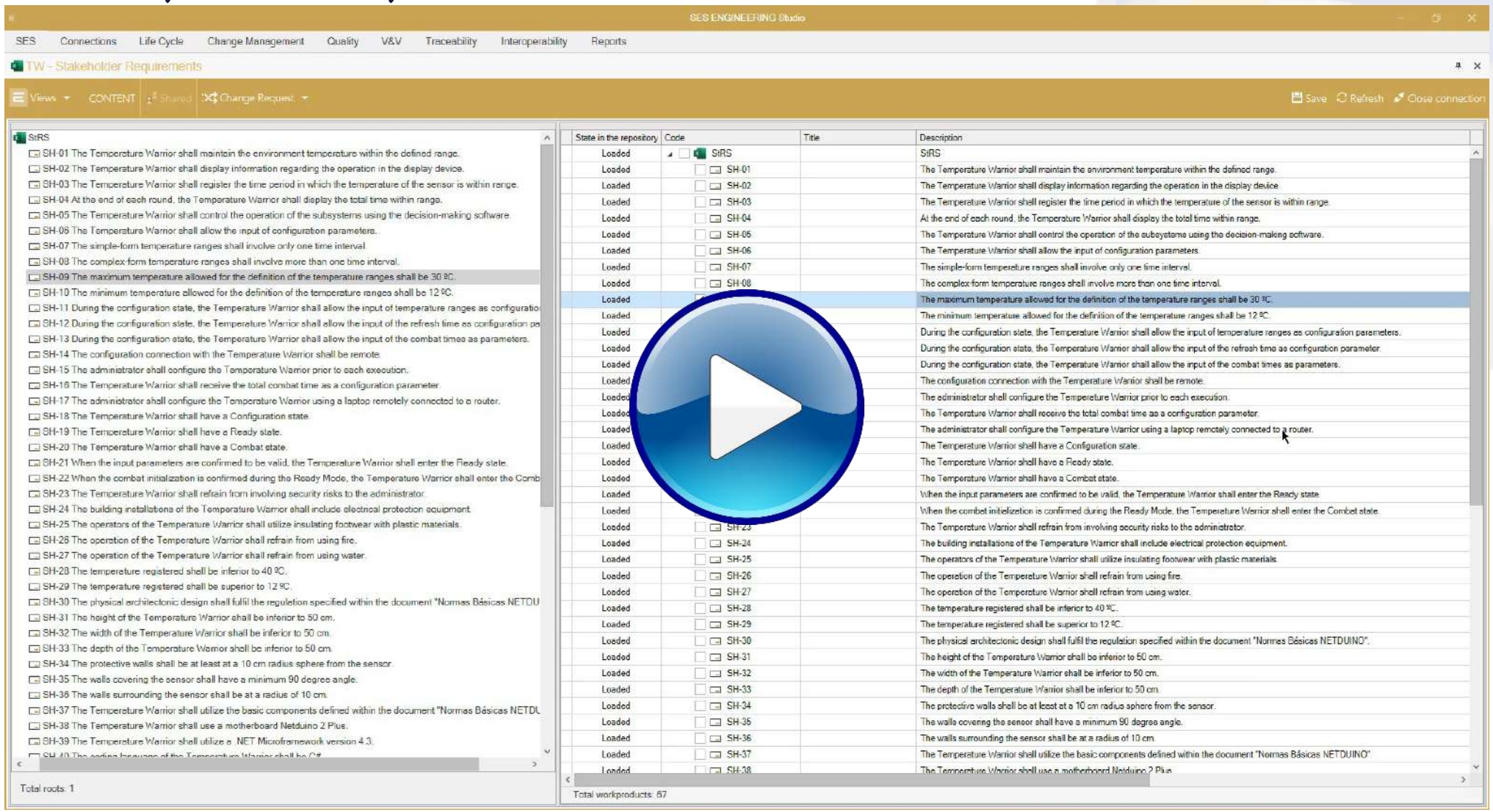


Live Demo
Configuration Management



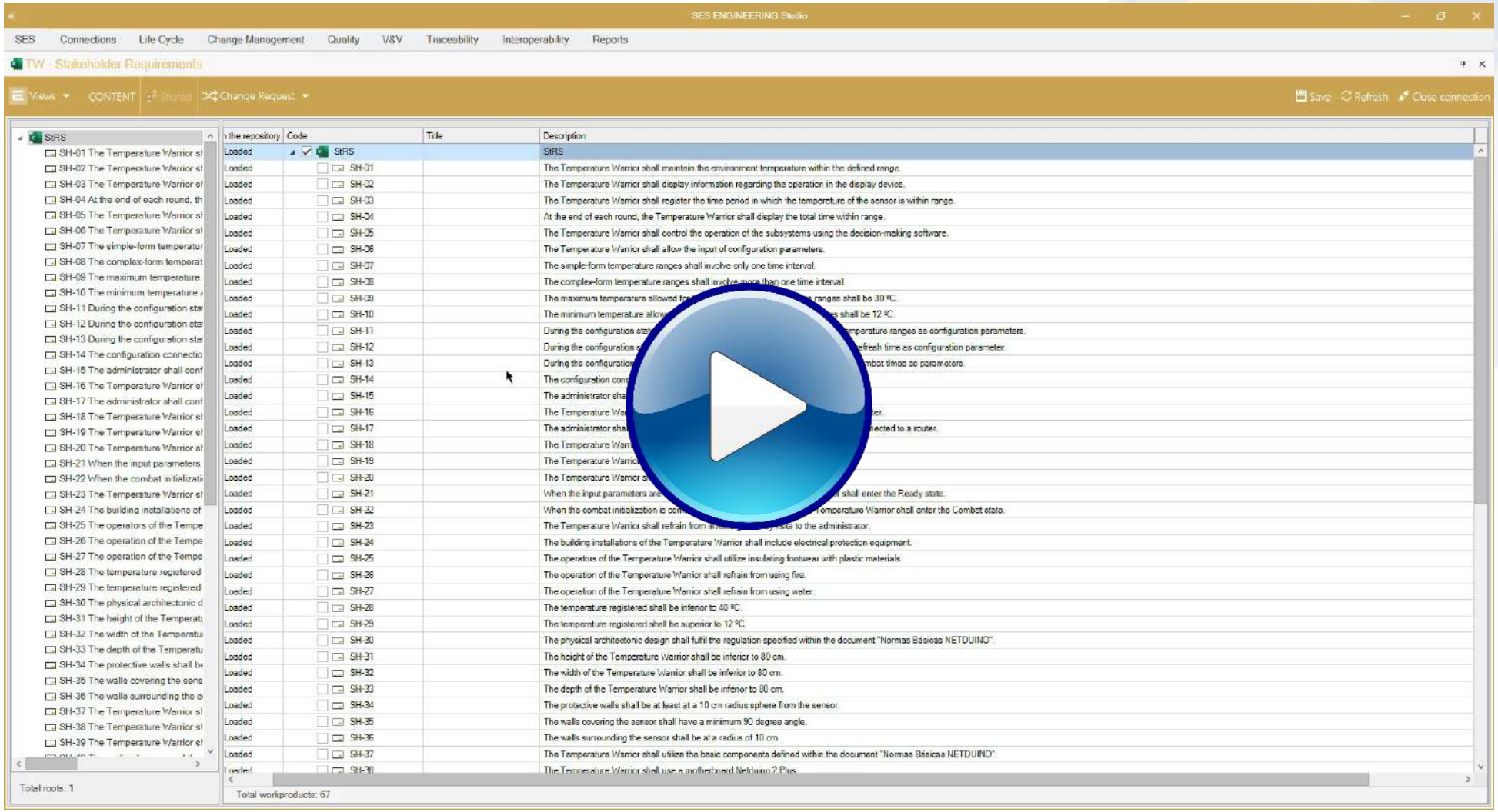
Live Demo: Use case #1

Use case #1: Object level / Objects set level CM



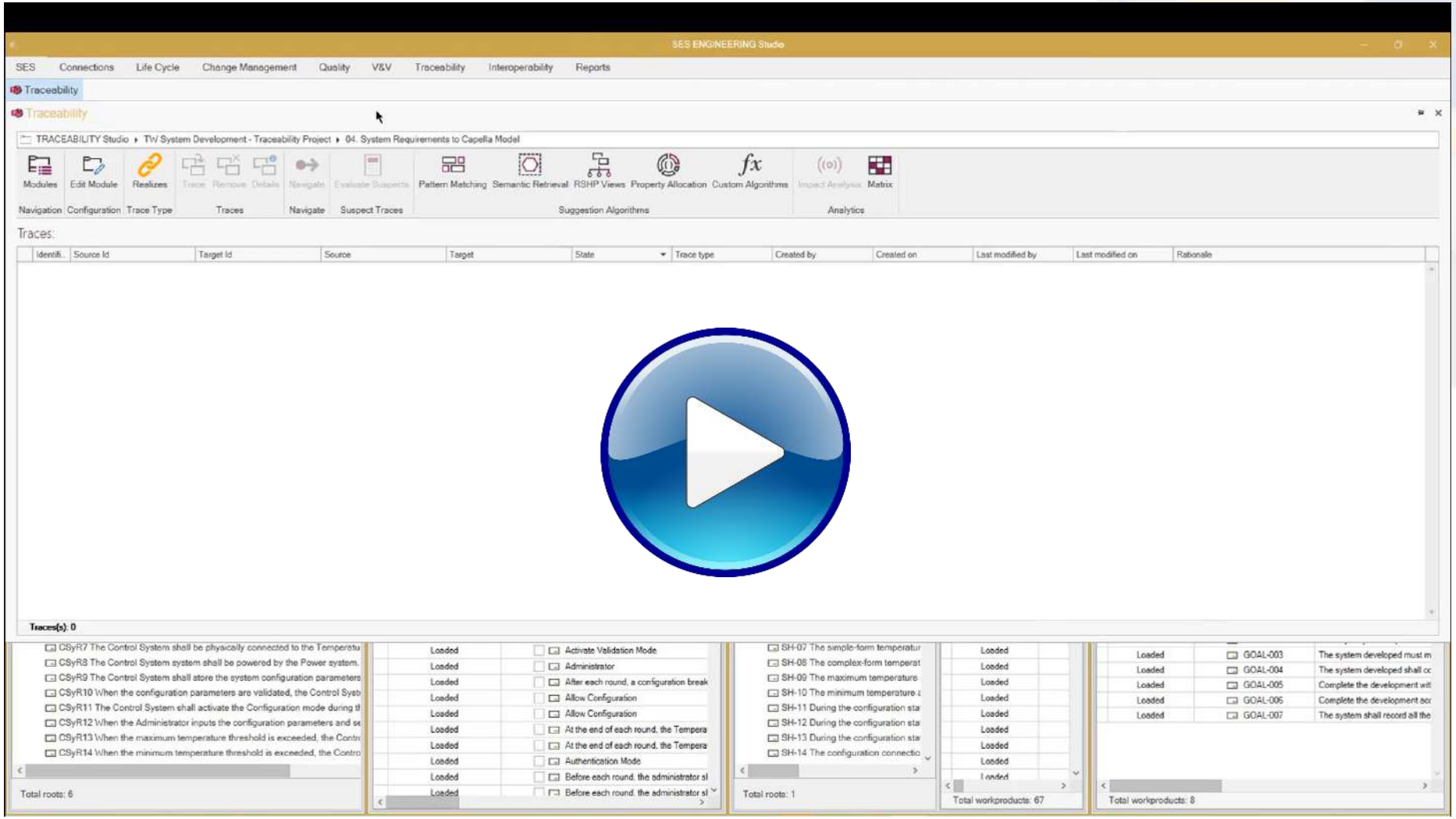
Live Demo: Use case #2

- **Use case #2:** Object level / Objects set level CM **with Change Control**



Live Demo: Use case #3

- **Use case #3:** Life Cycle Wide CM and baseline differences




Q&A

CONTROLLING THE VALUES OF YOUR SIGNALS IN TECHNICAL SPECIFICATIONS - HOW TO CONNECT YOUR REQUIREMENTS MANAGEMENT TOOL TO A PROJECT DICTIONARY

- *Have you ever dealt with low-level specifications involving signals and messages? How to know the exact name of the signals, and their possible values… requires a project dictionary that, in most cases, is far away from the Requirements Management tool.*
- *In this 15-minute webinar, you'll learn how the SES ENGINEERING Studio tackles this issue by connecting your preferred Requirements Management Tool (no matter which is your choice) to a project dictionary in real-time, suggesting the right names, checking the range of expected values, checking which signals can be sent or received by the components described in your textual requirements… and all this in a quick and simple manner.*

- **Dates:** December 13 and 15, 2022


Q&A

Ilyes Yousfi

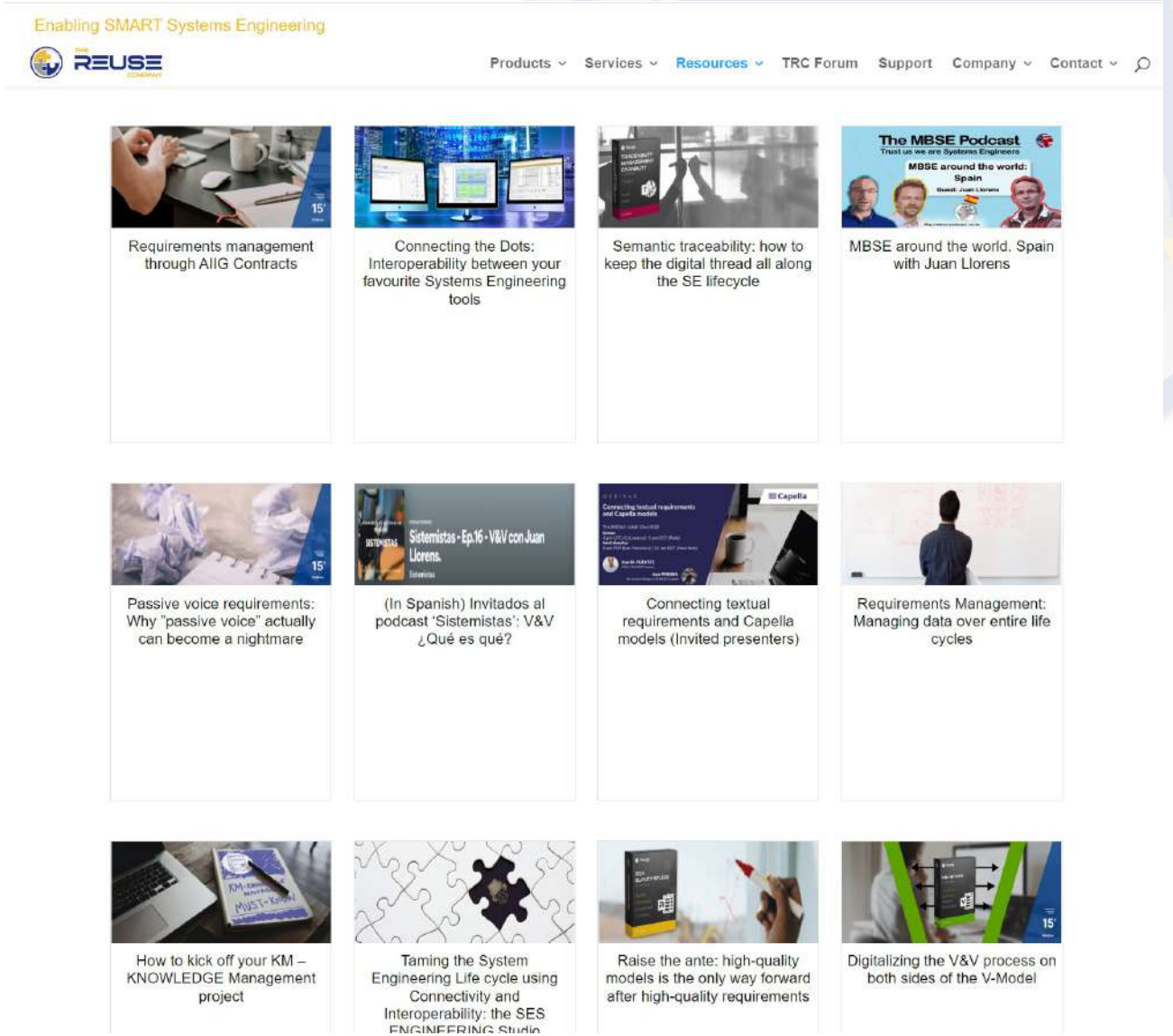
ilyes.yousfi@reusecompany.com

+34 627 08 66 01

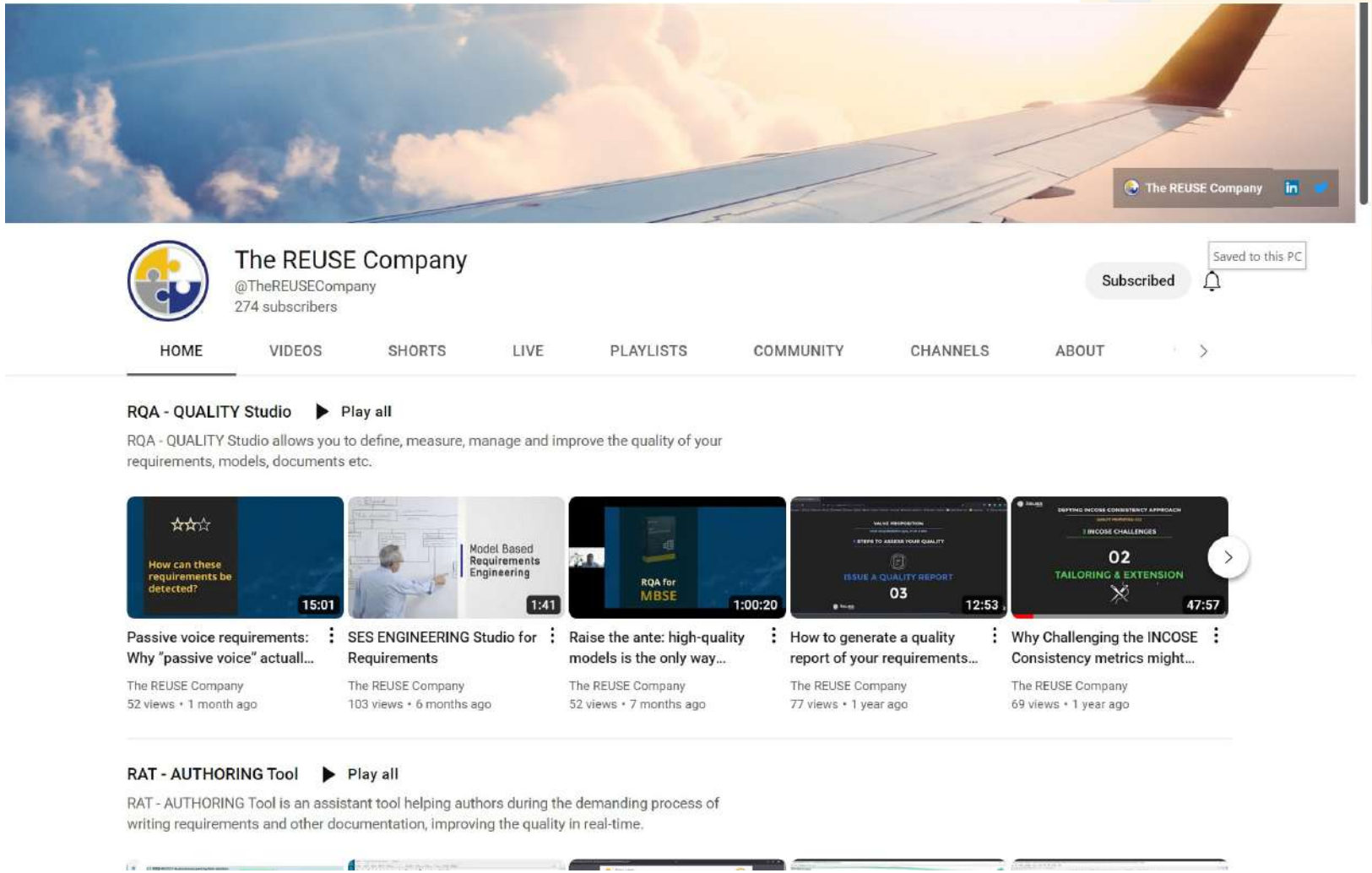
@ReuseCompany

https://www.linkedin.com/in/ilyesyousfi/en

- www.reusecompany.com
  - Resources -> Webinars (15' and 1hr)
  - Services
  - Support Forum



- The REUSE Company in Youtube:
  https://www.youtube.com/user/TheREUSECompany



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