



Rijkswaterstaat  
*Ministry of Infrastructure  
and Water Management*

# INCOSE EMEA, Workshop Oil and Gas

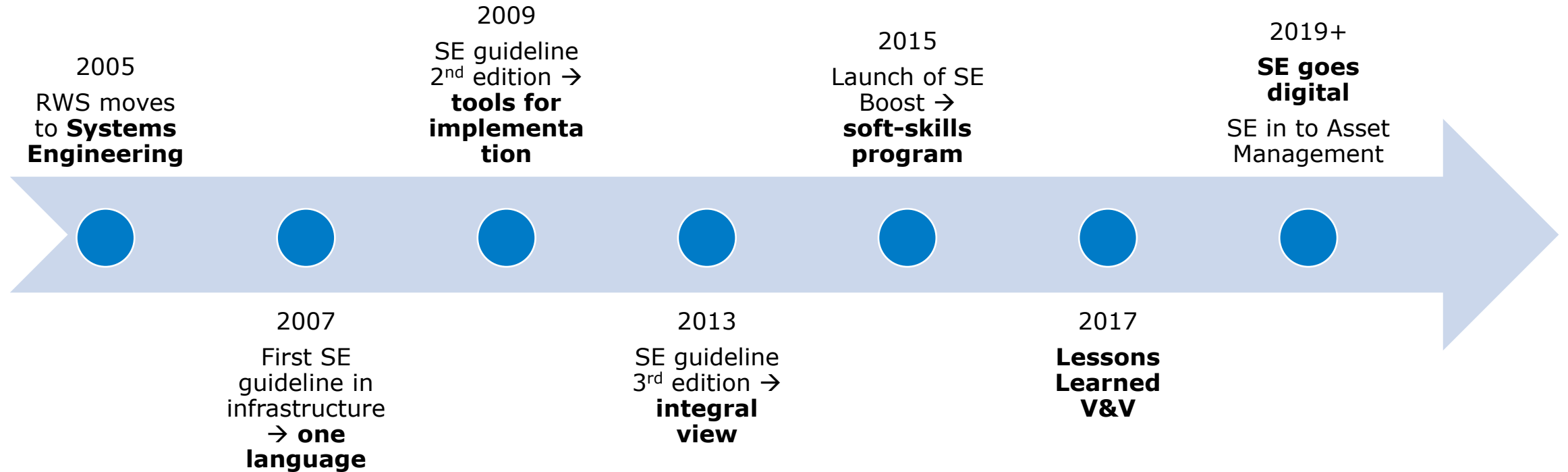
Reflections from Dutch  
Infrastructure Projects

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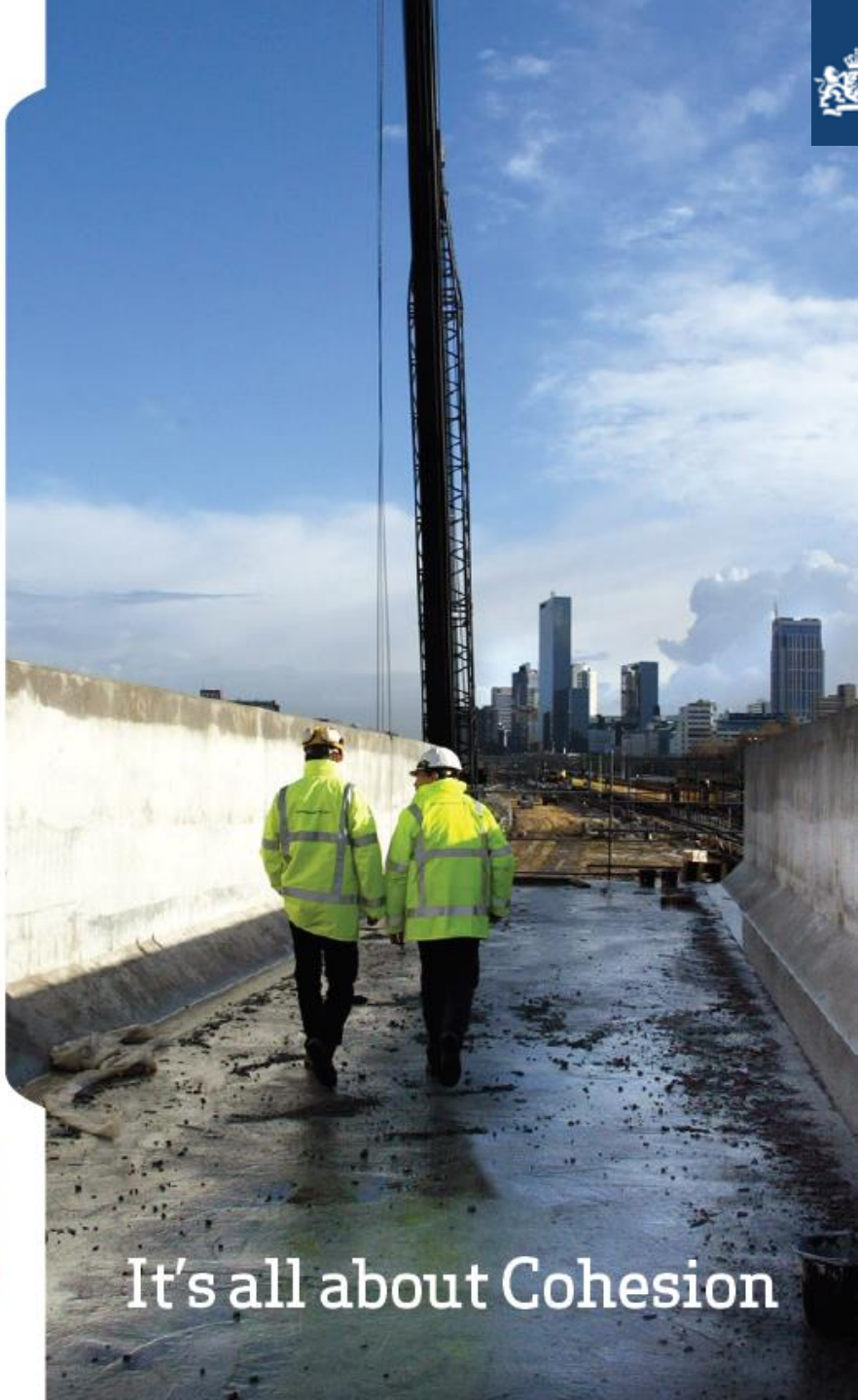


# Overview of RWS's SE Journey



One language in the sector:  
supported by 2 clients (ProRail and RWS, contractors and engineering firms)

One roadmap in the sector (based on CMMI):  
Requirements  
Verification and validation (V&V)  
Integral design & MBSE  
Asset Management  
Supply-chain optimization



## Overview of the five topics

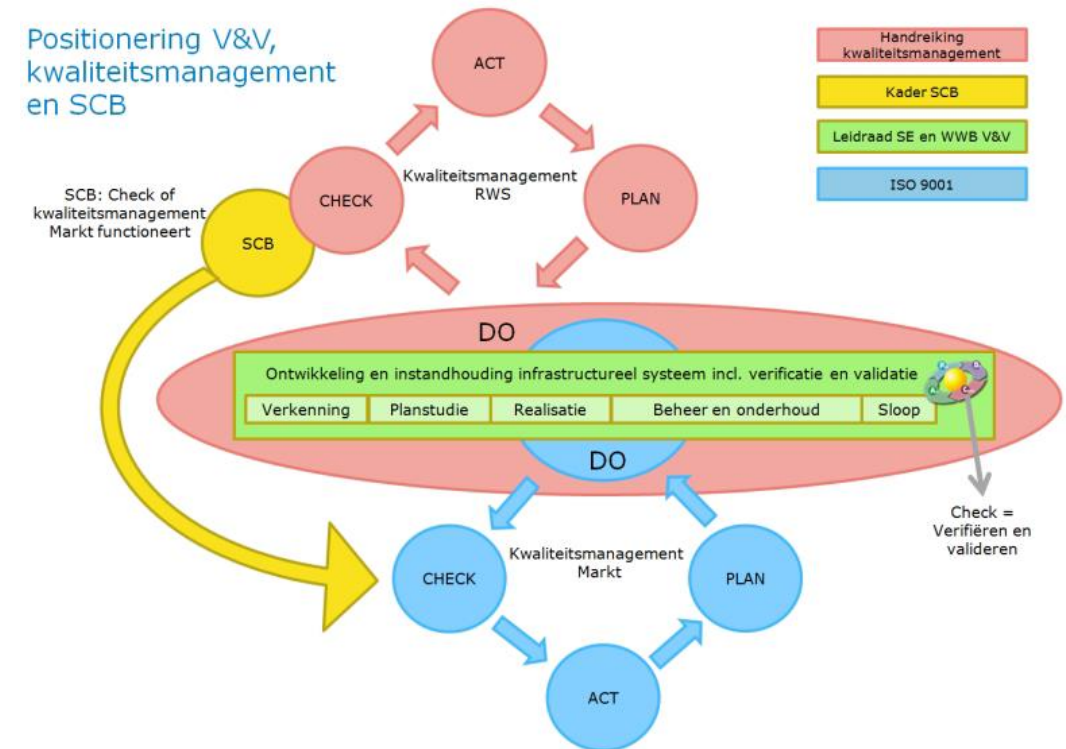
1. Managing V&V
2. Quality management of SE process
3. Uniform templates
4. Requirements & design
5. Software tools

It's all about Cohesion



# 1. How do you manage the complexity of verifying and validating (V&V) so many requirements?

- There are **1000s** of V&V statements and activities over **several project phases** (design, construction, commissioning).
- RWS has **aligned** QMS with the Contractor's QMS.
- Sometimes allow the **Contractor to formulate** the V&V statements against the requirements.
- Use a requirements management tool



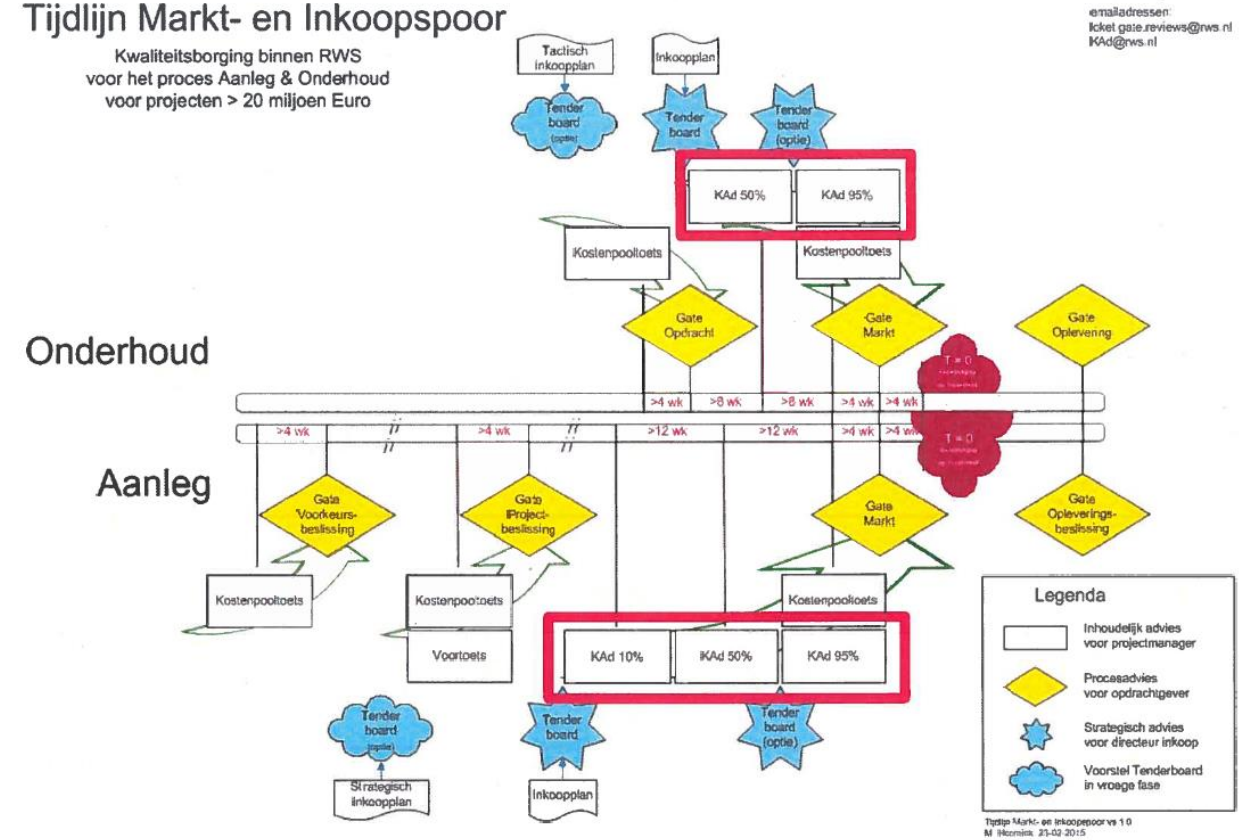


## 2. How can you measure that your new process is on the right path and that all parties are managing the requirements in the way that was intended/agreed?

- Introduce a **quality management method** on the requirements engineering products.
- RWS has team of “**auditors**”
- **Check/advise** at 10%, 50% and 95% of contract forming of nearly all RWS projects

### Tijdelijk Markt- en Inkoopspoor

Kwaliteitsborging binnen RWS voor het proces Aanleg & Onderhoud voor projecten > 20 miljoen Euro





### 3. How can we further promote standardization in our sector and promote reuse of requirements?

- Work on product type specifications, based on a **template**.
- Template has same structure as the **information model** used in the digital tool.
- **Co-create** templates with partners e.g. water authorities for dikes.
- Benefit: all specifications look the same, using **1 language in the entire sector** and then re-use in your next project

#### Basisspecificaties weginfrasysteem (HWN)



[Basisspecificatie Weginfrastelsel versie 3.8.5 \(1 januari 2018\)](#)

Beheerder: Vincent Kramer (GPO)



[Basisspecificatie Rijksweg versie 6.2.0 \(aug 2018\)](#)

Beheerder: Arjan Grashuis (GPO)

Onderliggende specificaties en contactpersonen zijn [hier](#) te vinden op de website van het steunpunt wegen en geotechniek.



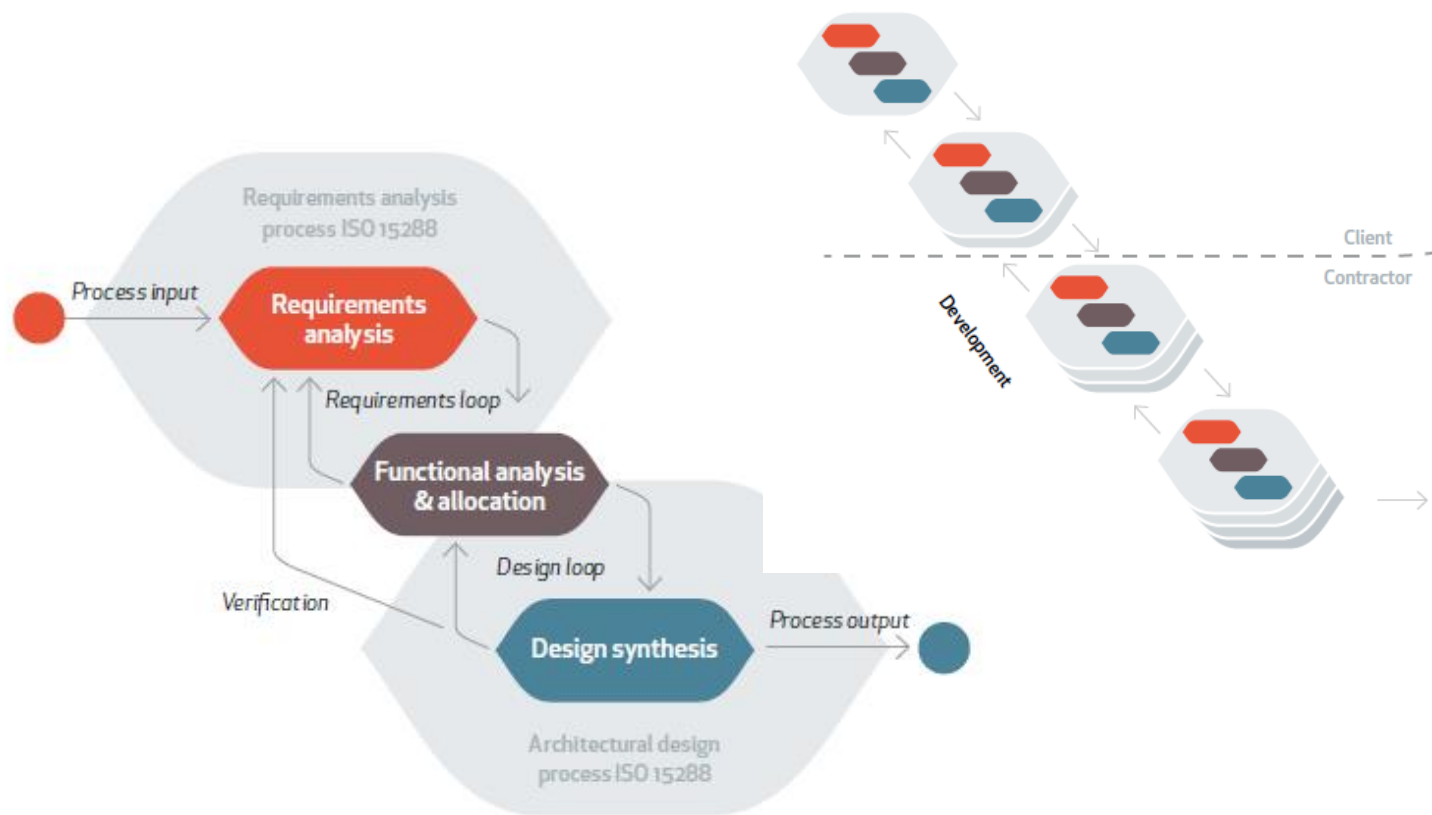
[Basisspecificatie Verzorgingsplaats versie 1.0 \(18 mei 2017\)](#)

Beheerder: Jeroen Boogers (GPO)



## 4. If you move to more functional requirements (i.e. solution-free) how do you avoid the market coming back with a solution you never intended/wanted (→ recycle, delays, frustrations)?

- You **cannot cover** all you need in a set of requirements.
- Dutch infra: specification = **requirements + design**
- Use **Operational Concept Descriptions** to frame the design.
- Helps keep future asset manager connected to project





## 5. People like tools and software-vendors like selling tools to people. How do we prevent getting locked in to tools that prevent/inhibit sharing digital requirements?

- **Avoid** the path to use one tool.
- Invest in an **open format for data exchange**
- Invest in **knowledge** and open information model.

