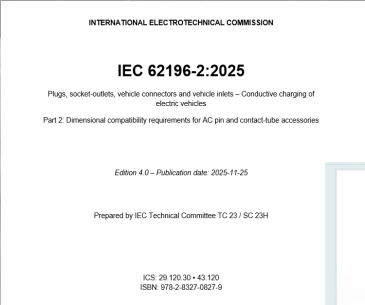




RE Charged

RE Tools and Methods Optimized



Chief Requirements Engineer Alpitronic



Principal Consultant Requirements Engineering



Consultant Systems Engineering



alpitronic - company profile

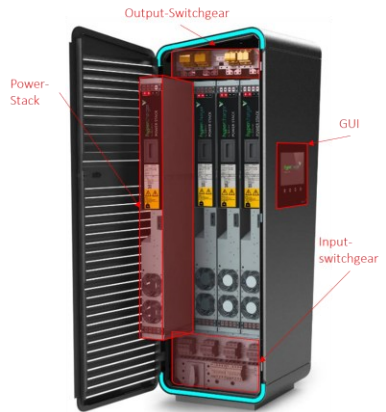
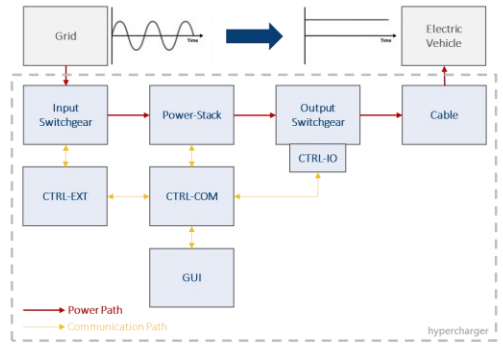
– alpitronic was founded in **2009** by 4 engineers as a start-up for **contract development** in the automotive and aerospace industries.

• **products and services:**

- 1) contract development (historical): electronics development in the field of power electronics (complete system: hardware and software)
- 2) power cycling: development of power cycling test benches and in-house testing service for semiconductor modules
- 3) development and production of high-power DC-charging systems: marketed under the brand **hypercharger**



hypercharger





Microsoft Teams

Riunione con Lorenzo Gasperi | Alpitronic

2026-04-09 09:28 UTC

Recorded by

Lorenzo Gasperi |
Alpitronic

Organized by

Lorenzo Gasperi |
Alpitronic



Fast facts

- in business since 2001
- currently ~30 consultants
- annual revenue ~4,5 mio.
- Strong growth course
- High customer orientation
- Excellence in methodology and implementation
- certified with ISO 9001, ISO/IEC 27001 and TISAX

Contact

HOOD GmbH
Keltenring 7
82041 Oberhaching

info@hood-group.com
+49 (0)89 451253-0

<https://hood-group.com>

Next Level Systems Engineering

With consultancy, coaching, operational support and training, we stand for the successful development and operation of complex products, services and systems.

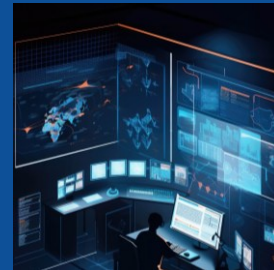
We create sustainable benefits through expertise and experience from over 20 years in customer projects. We are very successful with state of the art systems and requirements engineering in the automotive, transportation, medical technology, pharmaceutical and retail sectors.



Product Innovation



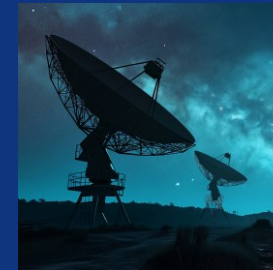
AI Services



MBSE & AI R&D



Organisations



PLM & ALM



Tools & SE Operations

Starting Point

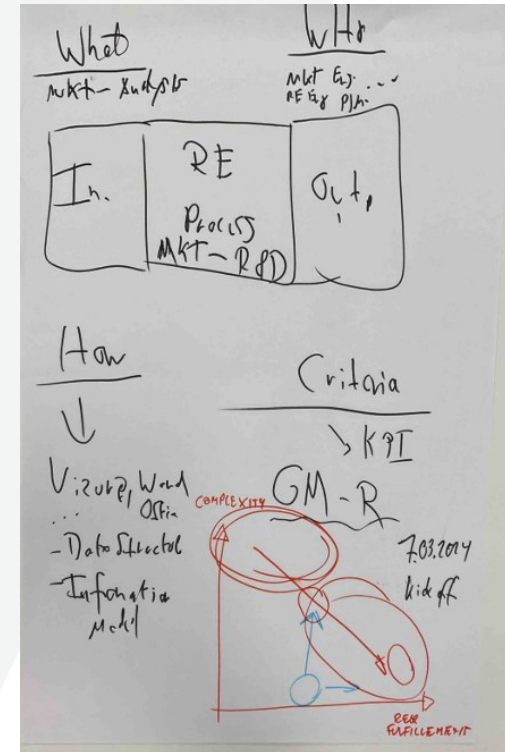


Solid Requirements Engineering was already established

New Product Challenges

Method and Tool Improvements planned

Consultancy and Implementation by



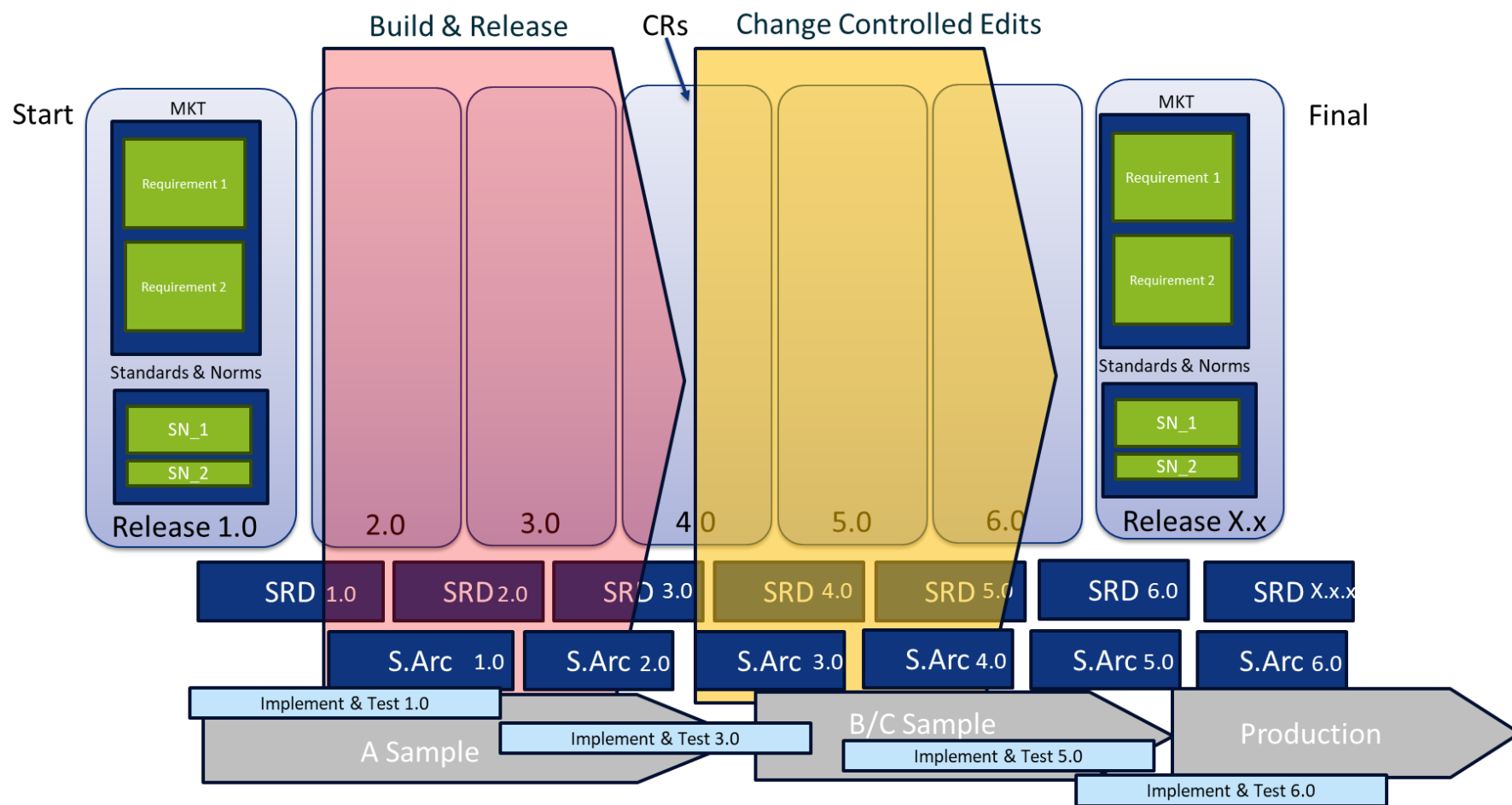
Tool Usage

Process Works

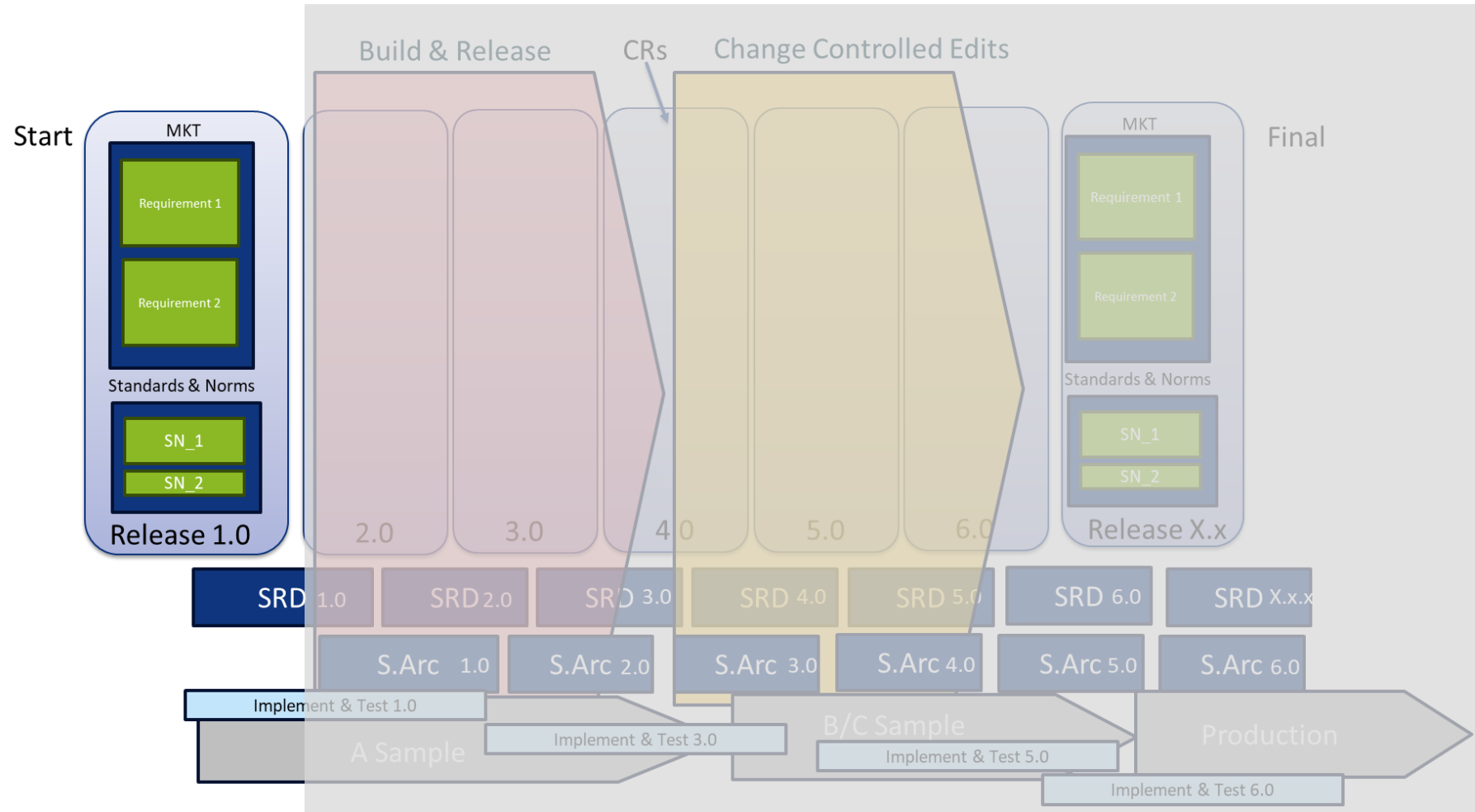
Main Stakeholders



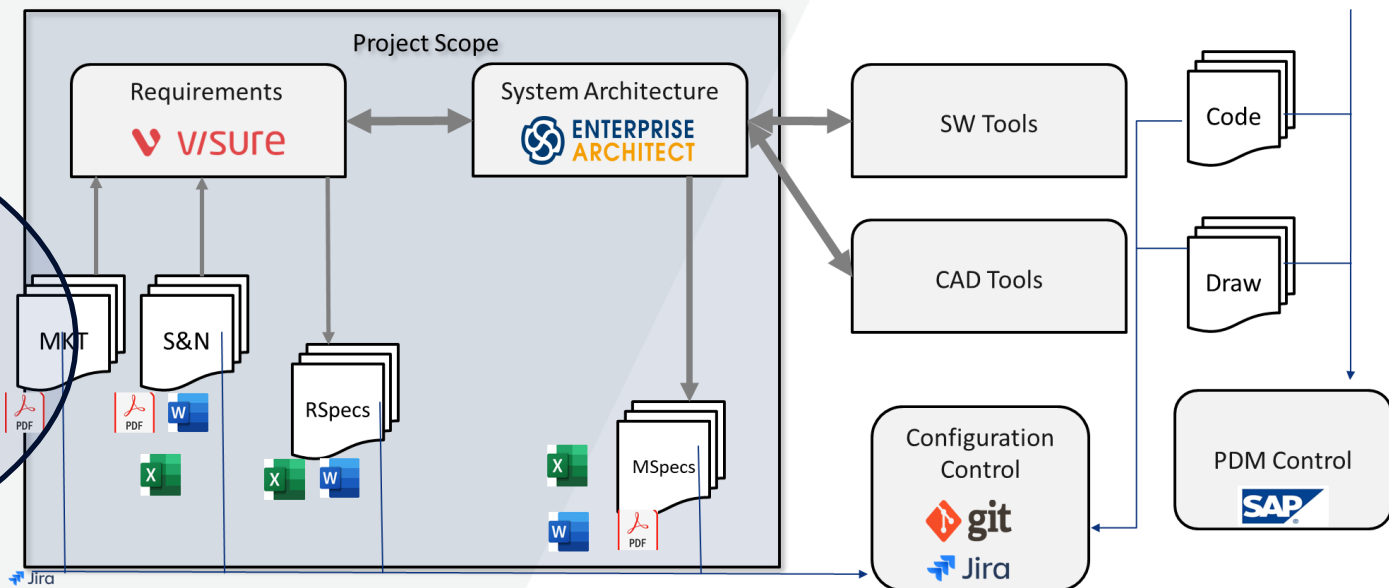
PRODUCT DEVELOPMENT LIFE CYCLE



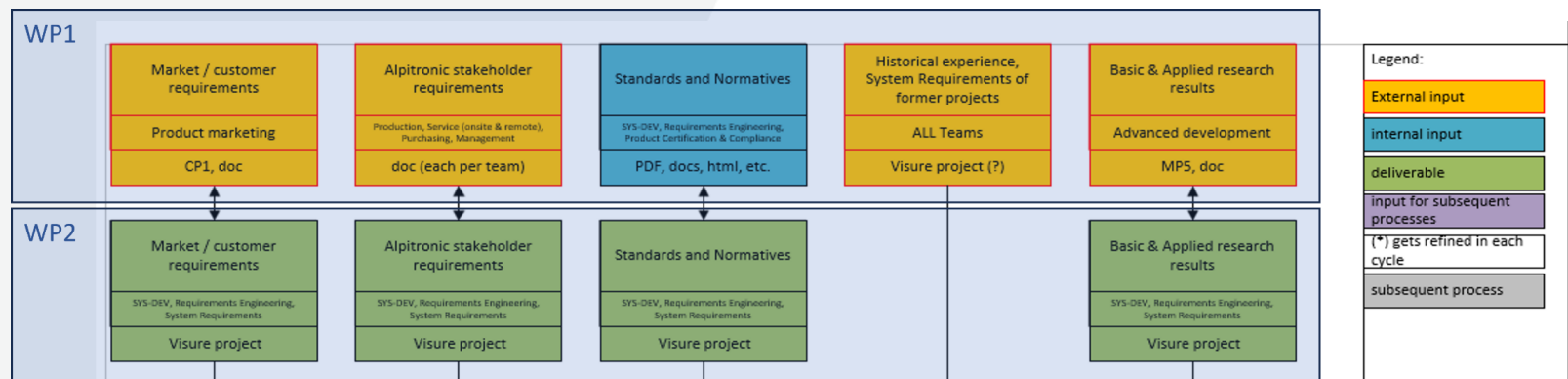
MARKETING INPUTS



Stakeholder Templates



Marketing Teams Input
considered highly
important !



MKT Stakeholder – Template and Process

Challenges:

Inconsistent Documentation Formats

No Closed Feedback Loop

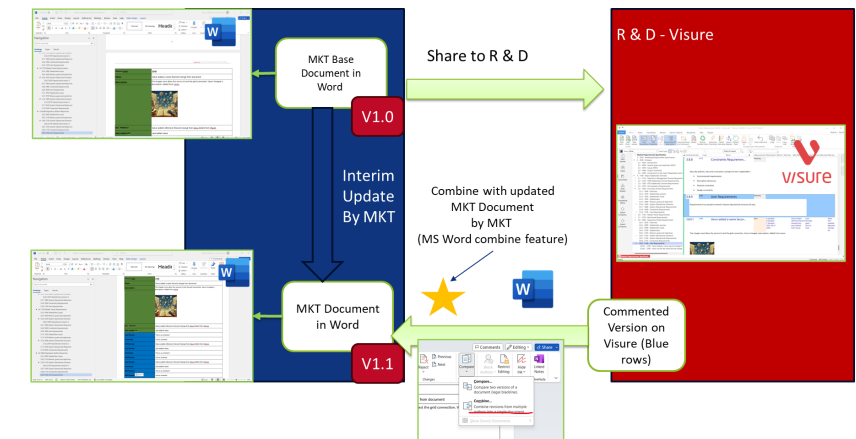
Broken Traceability Chain

3.1 Add New Requirements:

- To add new requirements, duplicate the requirement table with the relevant rows highlighted in green for marketing

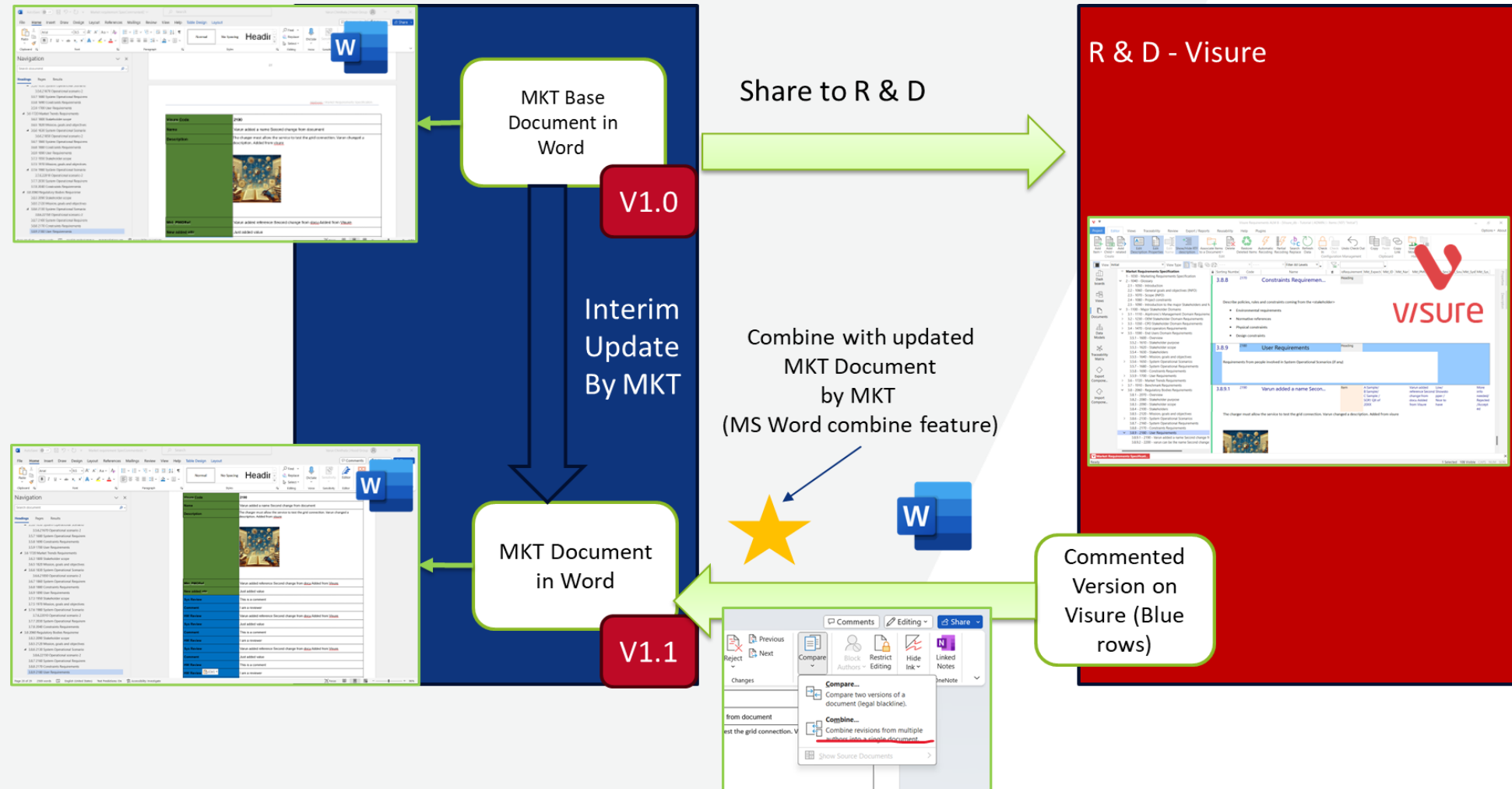
MKT_ID	MKT_3
Name	(free to choose, manually defined, if needed. Not handled by Visure) (can be empty)
Description	The charger must allow the service to test the grid connection. 
MKT_Source	PSO 1
MKT_Severity	Low/ Showstopper / Nice to have
MKT_ExpectedRelease	A Sample/ B Sample/ C Sample / SOP/ QX of 20XX
MKT_Feedback	To be filled to reply to the R&D comments

Marketing Requirements Template



Marketing <=> R&D Roundtrip
(Process + Tool realisation)

MKT Stakeholder Information Modell



WORD – VISURE ROUNDTRIP PITFALLS



- Mixed Content Types

Headings , Requirements, Support Information...

- Attribute Mapping

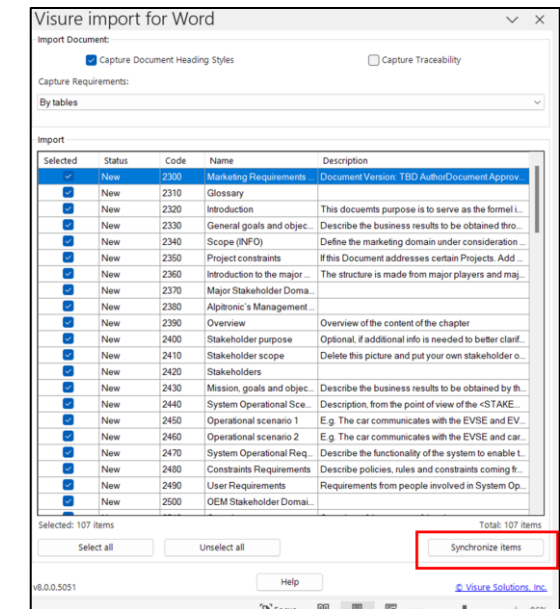
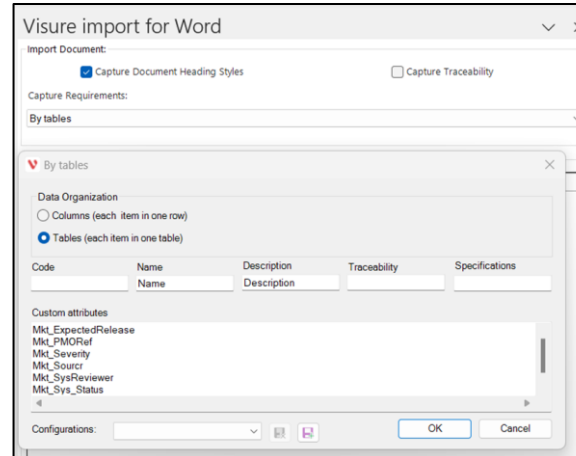
Custom attributes, enumerations...

- Identifier Integrity

Multiple identifiers across departments

- Versioning issue

Ensure no new versions for unchanged items



PROCESSING THE ISO NORMS



INTERNATIONAL ELECTROTECHNICAL COMMISSION

IEC 62196-2:2025

Plugs, socket-outlets, vehicle connectors and vehicle inlets – Conductive charging of electric vehicles

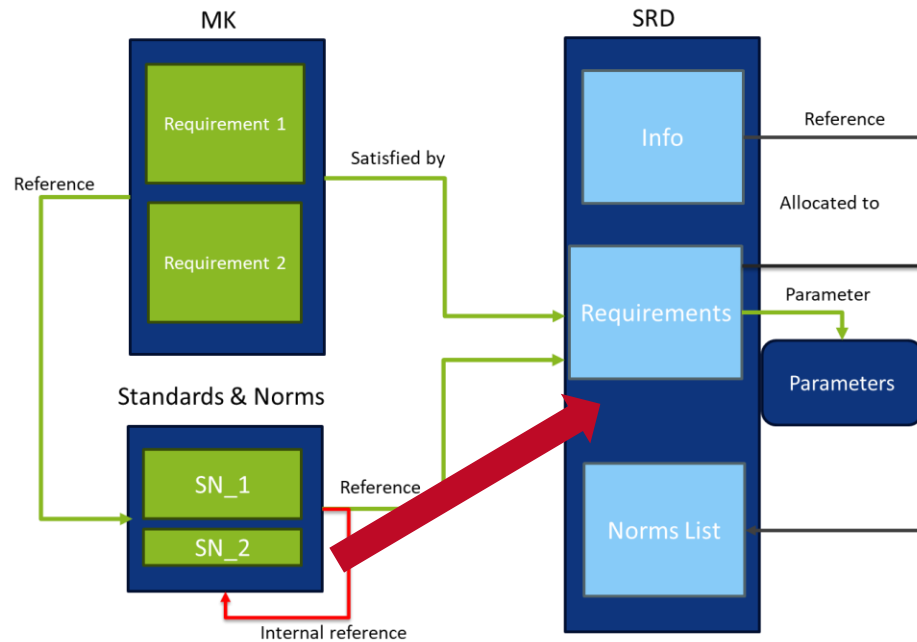
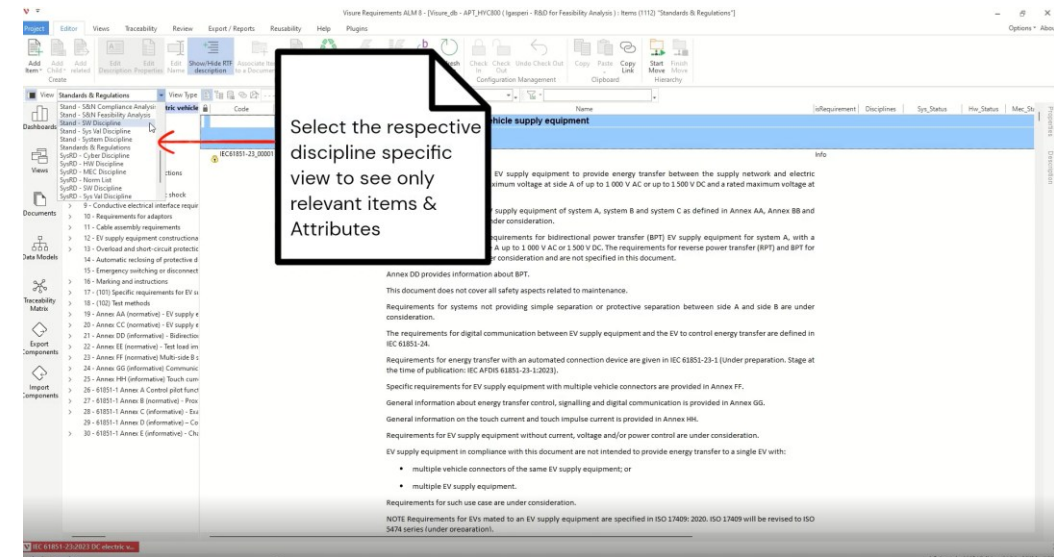
Part 2: Dimensional compatibility requirements for AC pin and contact-tube accessories

Edition 4.0 – Publication date: 2025-11-25

Prepared by IEC Technical Committee TC 23 / SC 23H

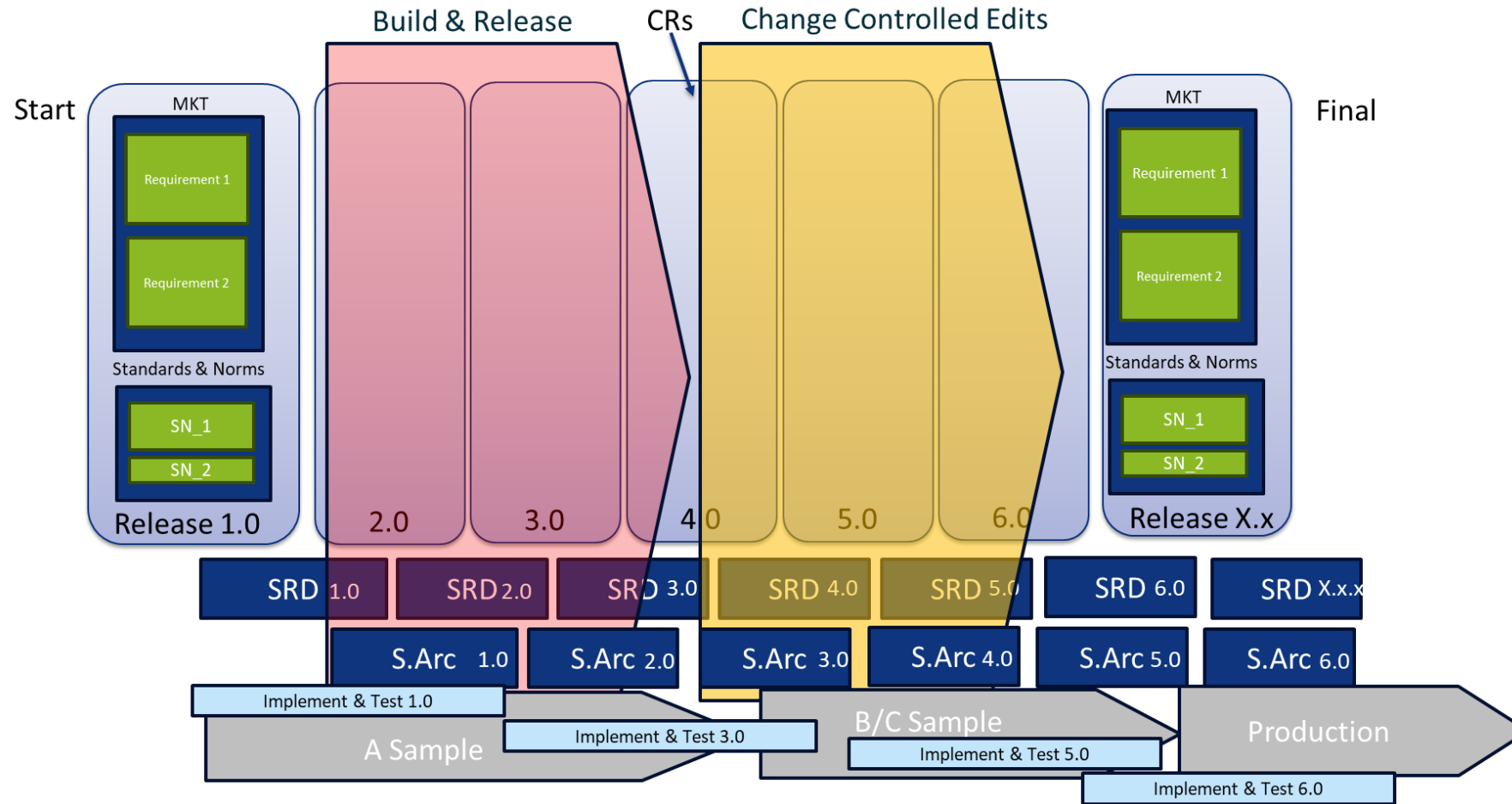
ICS: 29.120.30 • 43.120
ISBN: 978-2-8327-0827-9

Code	Clause#	Requirement	Name	Description
IEC62196-3_1	1	Item	Scope	This part of IEC 62196 is applicable to vehicle couplers with pins and contact tubes of standardized configuration, herein also referred to as "accessories", intended for use in the following documents are referred to in the text in such a way that some or all of their content constitutes requirements of this document. For dated references, only the edition for the purposes of this document, the following terms and definitions apply.
IEC62196-3_2	2	Item	Normative references	ISO and IEC maintain terminological databases for use in standardization at the following electrical energy provision from an external source used for purposes other than charging of the electric vehicle propulsion battery
IEC62196-3_3	3	Item	Terms and definitions	assembly consisting of flexible cable or cord fitted with a standard plug or EV plug and/or a vehicle connector, that is used to establish the connection between the EV and the supply part separated or attached, which may be used to provide the degree of protection of an EV plug or vehicle inlet, when it is not engaged with an EV socket-outlet or a vehicle connector
IEC62196-3_3.1	3.1	Item	auxiliary power	part of a terminal necessary for the clamping and the electrical connection of the conductor
IEC62196-3_3.2	3.2	Item	cable Assembly	Compatible ability of accessories to join together and be functional
IEC62196-3_3.3	3.3	Item	cap	Note 1 to entry: Non-compatible accessories can physically join together, but not be prospective current that an accessory, protected by a specified short-circuit protective device, can withstand satisfactorily for the total operating time of that device under specified part that can carry electric current
IEC62196-3_3.4	3.4	Item	clamping unit	[SOURCE: IEC 60950-1:2012, 195-01-06]
IEC62196-3_3.5	3.5	Item	compatibility	Single conductive path
IEC62196-3_3.6	3.6	Item	conditional short-circuit current	assembly consisting of a flexible cable or cord fitted with an EV plug that is intended to mate with a vehicle connector as covered by the IEC 62196 series
IEC62196-3_3.7	3.7	Item	conductive part	electrical device intended for the controlling, signalling, interlocking, etc. or switchgear and controlgear
IEC62196-3_3.8	3.8	Item	connection	Wholly providing the degree of protection of an accessory when it is not engaged with a standard or EV socket-outlet or vehicle connector
IEC62196-3_3.9	3.9	Item	cord extension set	
IEC62196-3_3.10	3.10	Item	control circuit device	
IEC62196-3_3.11	3.11	Item	cover	

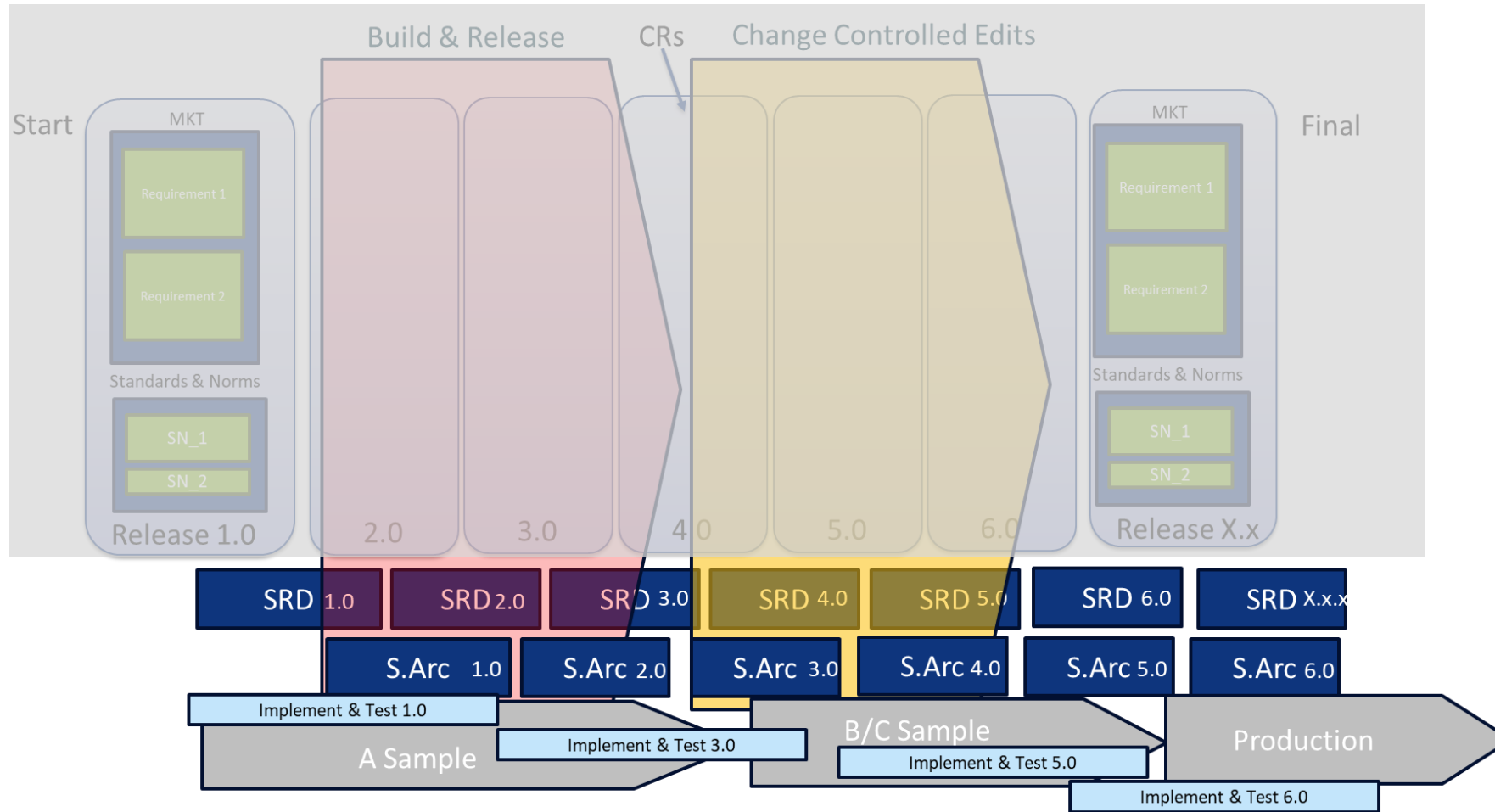


Complex Mapping

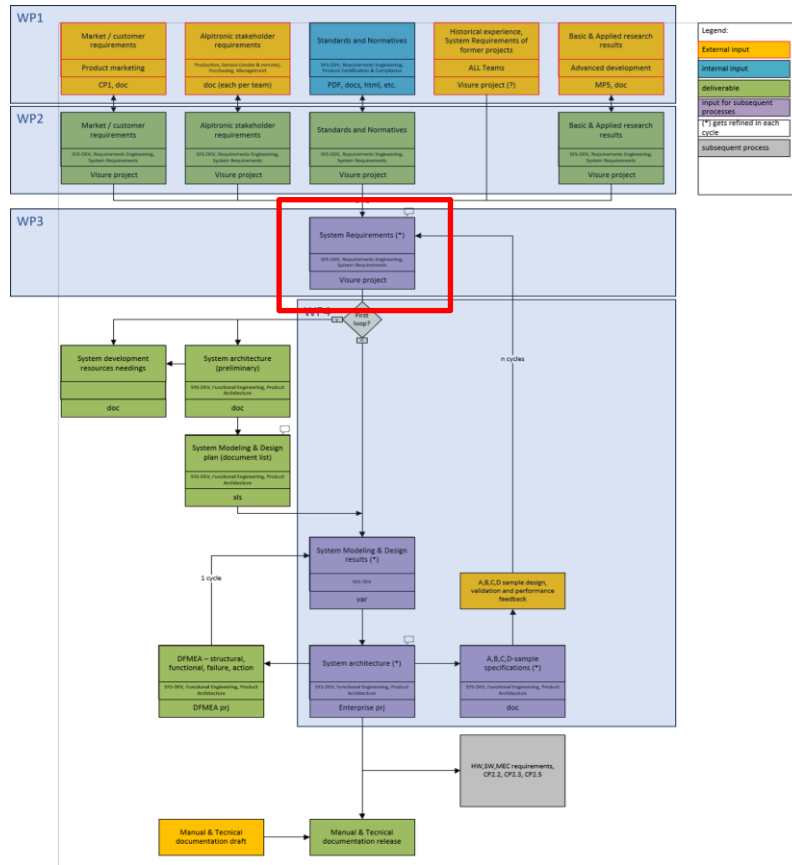
PRODUCT DEVELOPMENT LIFE CYCLE



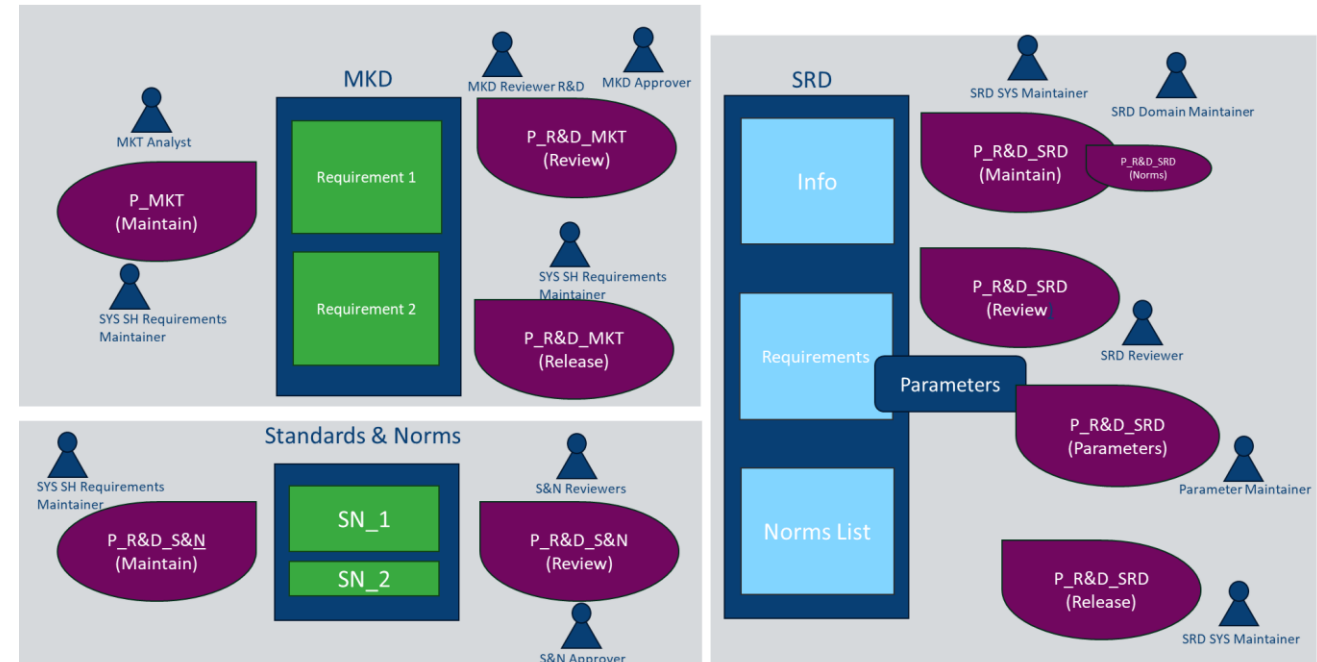
PRODUCT DEVELOPMENT LIFE CYCLE



FROM PRINCIPAL INFORMATION MODELL TO TOOL IMPLEMENTATION



RE Process Overview

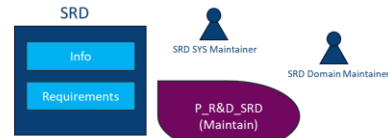


EXAMPLE OF A PROCESS DESCRIPTION SHEET



Maintain System Requirements

- Tools & Guidelines
- Attribute Schema
 - SRD Template
 - SRD Support Documentation



Writing System Requirements:

- **SRD Domain Maintainer** is responsible for documenting the requirements.
- **SRD SYS Maintainer** ensures that Requirements are written in the prescribed chapter according to the document structure, which is designed according to the project requirements. For details about how to write system requirements see "SRD Support Documentation"
- **SRD SYS Maintainer** shall allocate the different requirements to the specific discipline.
- During requirements writing, "Item Status" shall be set to "In Work"
- After editing, the "Item Status" of the edited requirement shall be set to "Ready for Review" and the process "P_R&D_SRD (Review)" triggered
- In case "Released" requirements become obsolete, the "Item Status" shall be set to "Obsolete" and the reason for deletion shall be added as a comment (do not use Delete feature from Visure)

Updating System Requirements due to CR:

- When the requirements with "Item Status" set to "Released" needs to be updated due to a CR, "Item Status" shall be set to "In Work".
- When new requirements are created/deleted, or existing ones are updated due to CR from Jira, the Jira reference code shall be mentioned in the "Source" attribute.
- After editing, the "Item Status" of the edited requirement shall be set to "Ready for Review" and the process "P_R&D_SRD (Review)" triggered

Linking to Marketing Requirements:

- **SRD SYS&Domain Maintainer** shall establish links to the marketing requirements that are source of the System requirements.

Linking to S&N Requirements:

- **SRD SYS&Domain Maintainer** shall establish links to the S&N that are source of the System requirements.

Linking to CR:

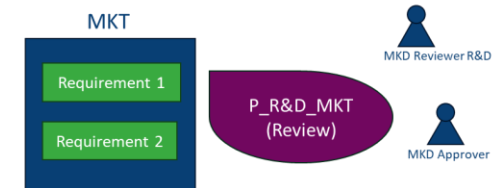
- In case of CR, **SRD SYS&Domain Maintainer** establish links to the CR that are source of the system requirements.

Reports:

- **SRD SYS Maintainer** have the possibility to provide statistical reports about on the SRD state
Example: Reports on requirements already reviewed by Research & Development (R&D).

Review Marketing Requirements

- Tools & Guidelines
- Visure MKD
 - Attribute Schema



Review Process (Compliance analysis)

- To skip at the beginning of a new project (no product design available)
- **MKD Reviewer R&D** across various disciplines shall examine the requirements allocated to the specific discipline and define the **compliance** status & also mention the compliance analysis date.
- Chief engineer status of all requirements with Compliance Status attribute set to "Compliant" are set to Feasible. Disciplines feasibility analysis to be performed only on not compliant requirements.

Review Process (Feasibility analysis):

- **MKD Reviewer R&D** across various disciplines shall examine the requirements allocated to the specific discipline and define the **feasibility** status.
- **MKD Reviewer R&D** provide comments if additional information is required or if they consider the requirement feasible/not-feasible.
- Following the R&D review, the **MKD Approver** evaluates the requirements.
- The **MKD Approver** allocates a status to each requirement, indicating whether it is to be reviewed, not applicable, feasible, not feasible, or if more information is needed.



Instructions Video 4 - Transfer links between requirement documents.mp4



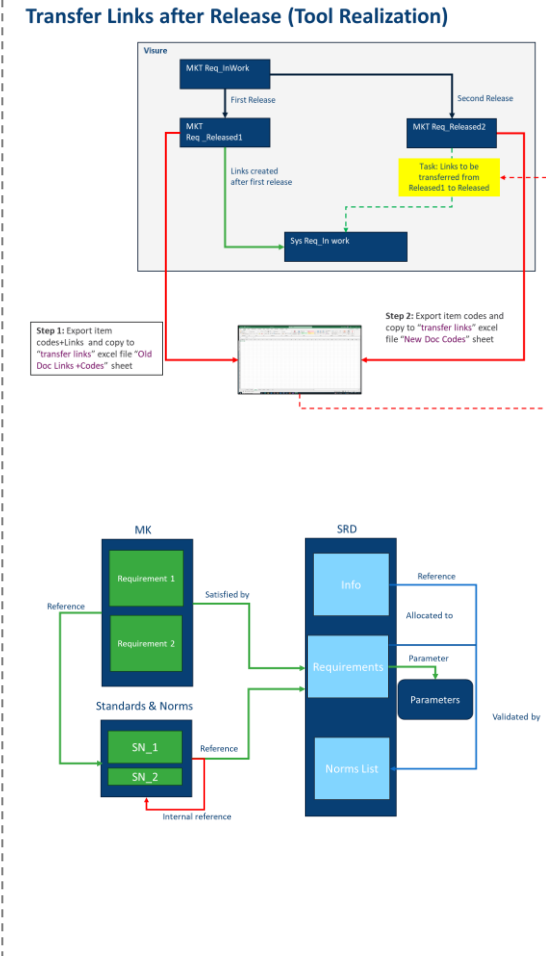
Instructions Video 5 - Perform feasibility analysis .mp4



Instructions Video 3 Release Process - Using Visure Review Plugin.mp4

Tutorial videos showing exact steps to be performed in tools

- ## Links and documents travel together



TOOL SUPPORT



Visure Requirements ALM 8 - [Visure_db - APT_HVC800 (Igsaperi - R&D for Feasibility Analysis) : Documents (12) "Default1"]

Options - About

Project Editor Views Traceability Review Export / Reports Reusability Help Plugins

Add Item Add Child Add related Edit Description Edit Properties Edit Name Show/Hide RTF description Associate Items to a Document Delete Restore Deleted Items Automatic Recoding Partial Recoding Search Replace Refresh Data Check In Check Out Undo Check Out Configuration Management Copy Paste Copy Link Start Move Finish Move Clipboard Move Hierarchy

View Default1 View Type

DOCUMENTS

- Requirements
 - 03. Released
 - 01. SYS 1 - Input Requirements
 - Standards & Regulations
 - Marketing Requirements
 - 02. SYS 2 - System Requirements
 - Glossary

Documents	Access Partition	Prefix	Doc Status
Requirements (10)	Default		
01. SYS 1 - Input Requirements (5)	Default		
Standards & Regulations (1)	Default		
IEC 61851-23:2023 DC electric vehicle supply equipment	Default		
Marketing Requirements (2)	ProductMarketing_InWork		
02. SYS 2 - System Requirements (2)	Default		
03. Released	Release		
Glossary	Default		

1 Selected 8 Visible CAPS NUM SCRL

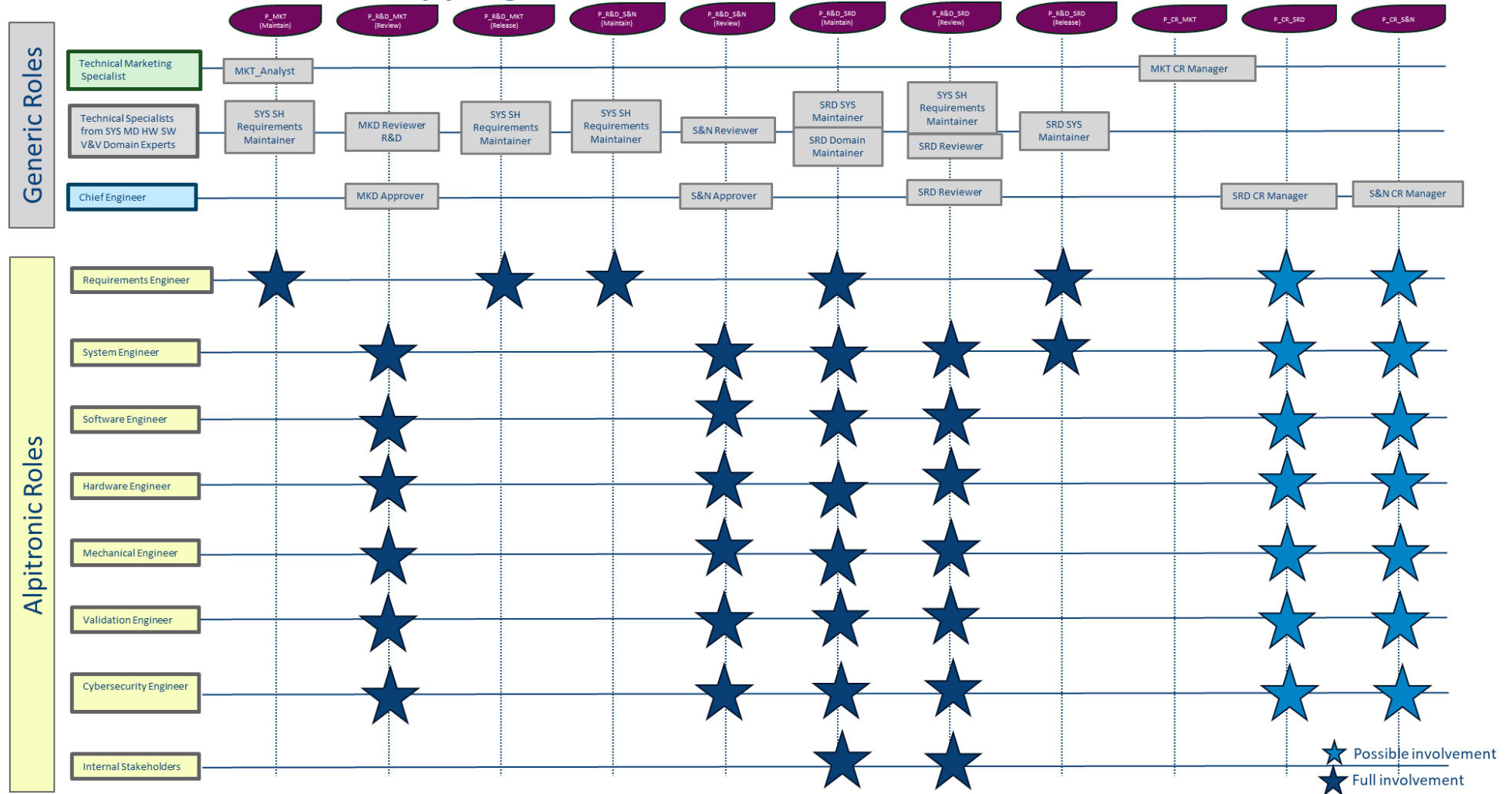
Ready

14/06/2024 15:36

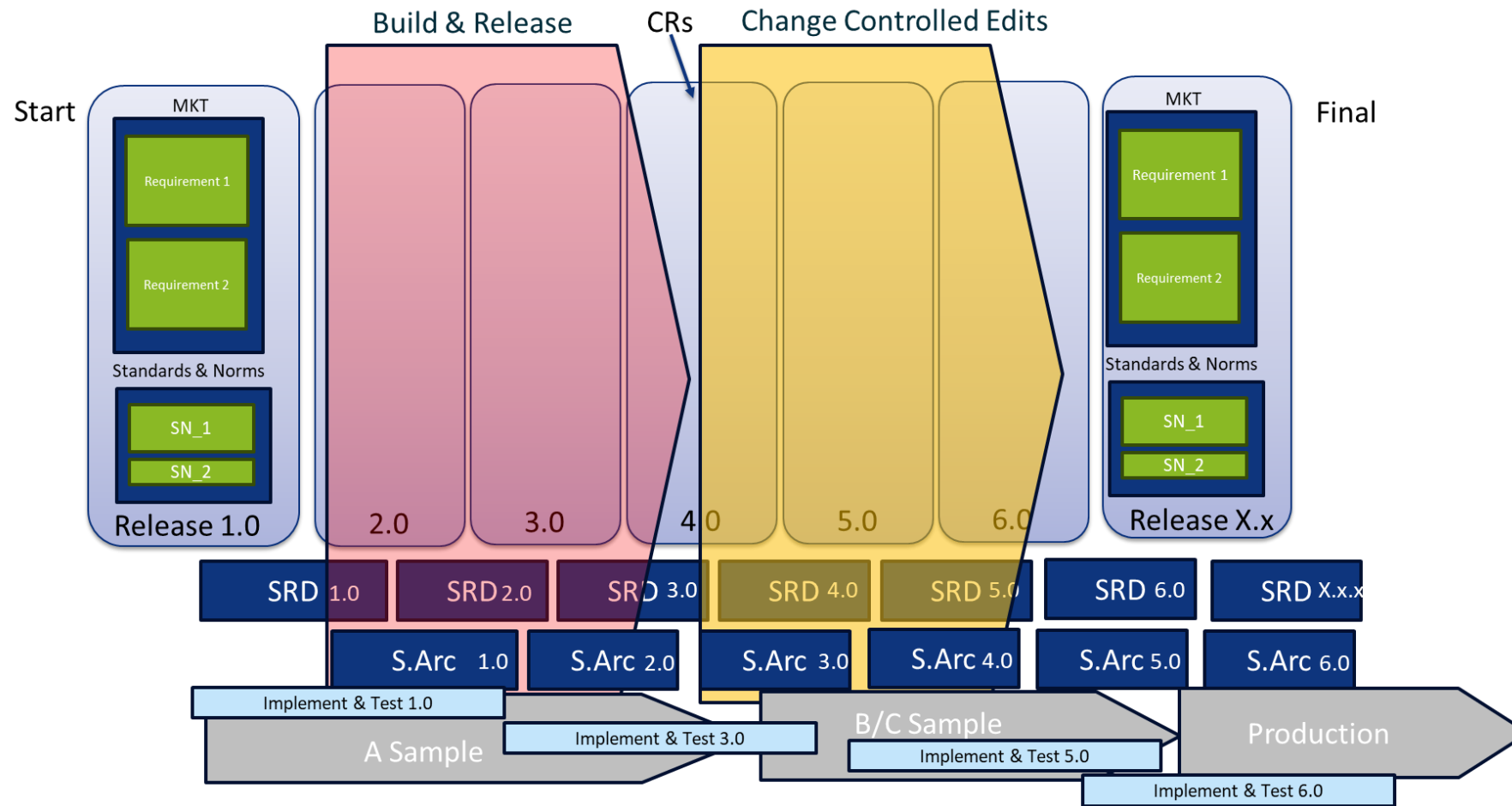
ROLES PLAY A ROLE



RE Process Roles Mapping



PRODUCT DEVELOPMENT LIFE CYCLE





- **We showed the Company initial situation**
- **We highlighted the main tasks for improving the Requirements Engineering**
- **2 Stakeholder examples – Marketing , Standard & Norms**
- **Implementation of roles, MRD, SRD and tasks in VISURE**
- **Examples of Process and Tool Documentation**





Backup

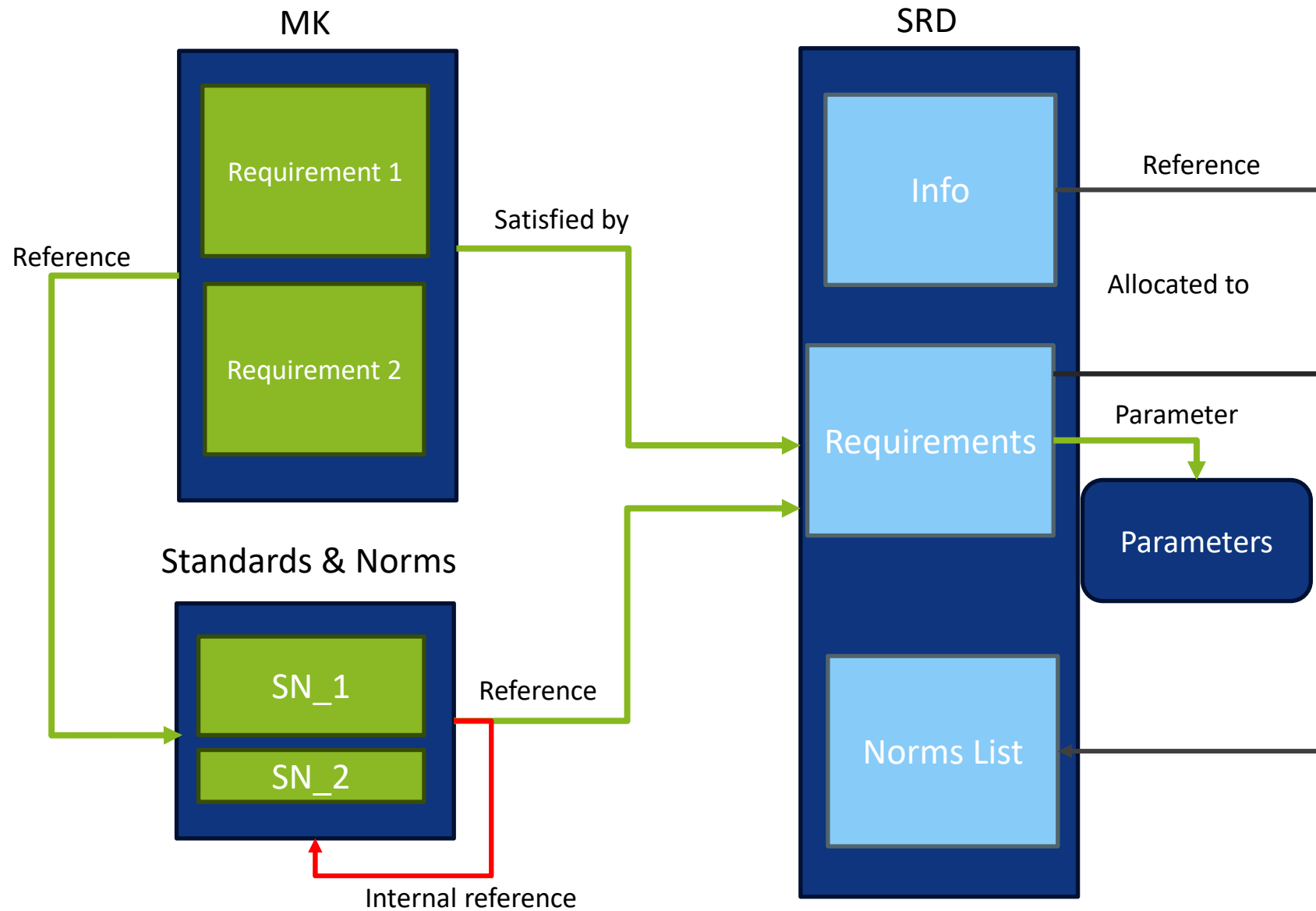
Restrospektive



ToDo: Lessons Learned / Further Tasks

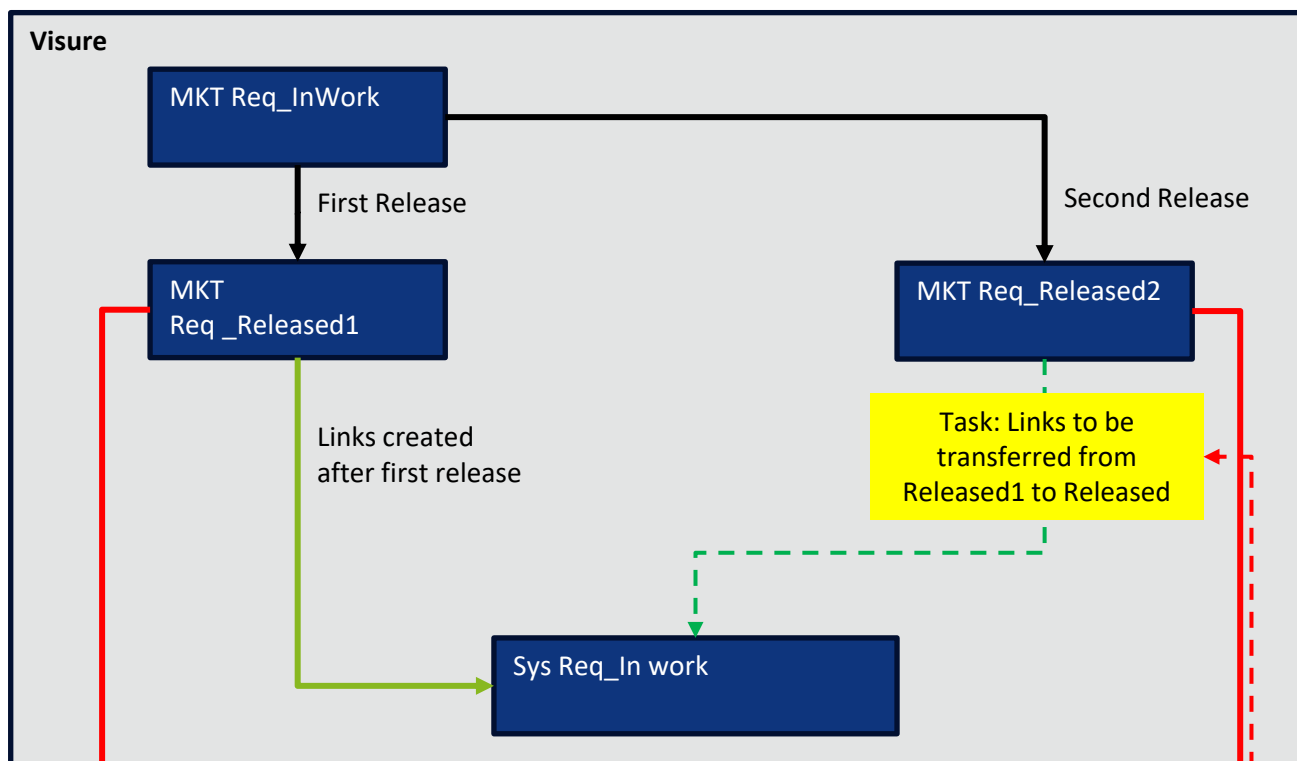
- Specialized RM Tool not usable by every Stakeholder
- Word/Excel Roundtrips with special features need time
- Engineering roles vs organisation roles
- Etc.??

REQUIREMENTS TRACEABILITY MODEL

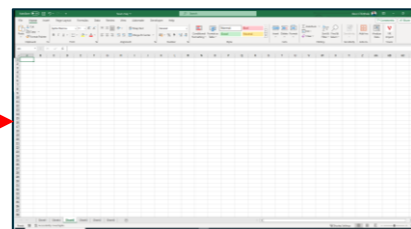




TRANSFER LINKS AFTER RELEASE (TOOL REALIZATION)



Step 1: Export item codes+Links and copy to "transfer links" excel file "Old Doc Links +Codes" sheet



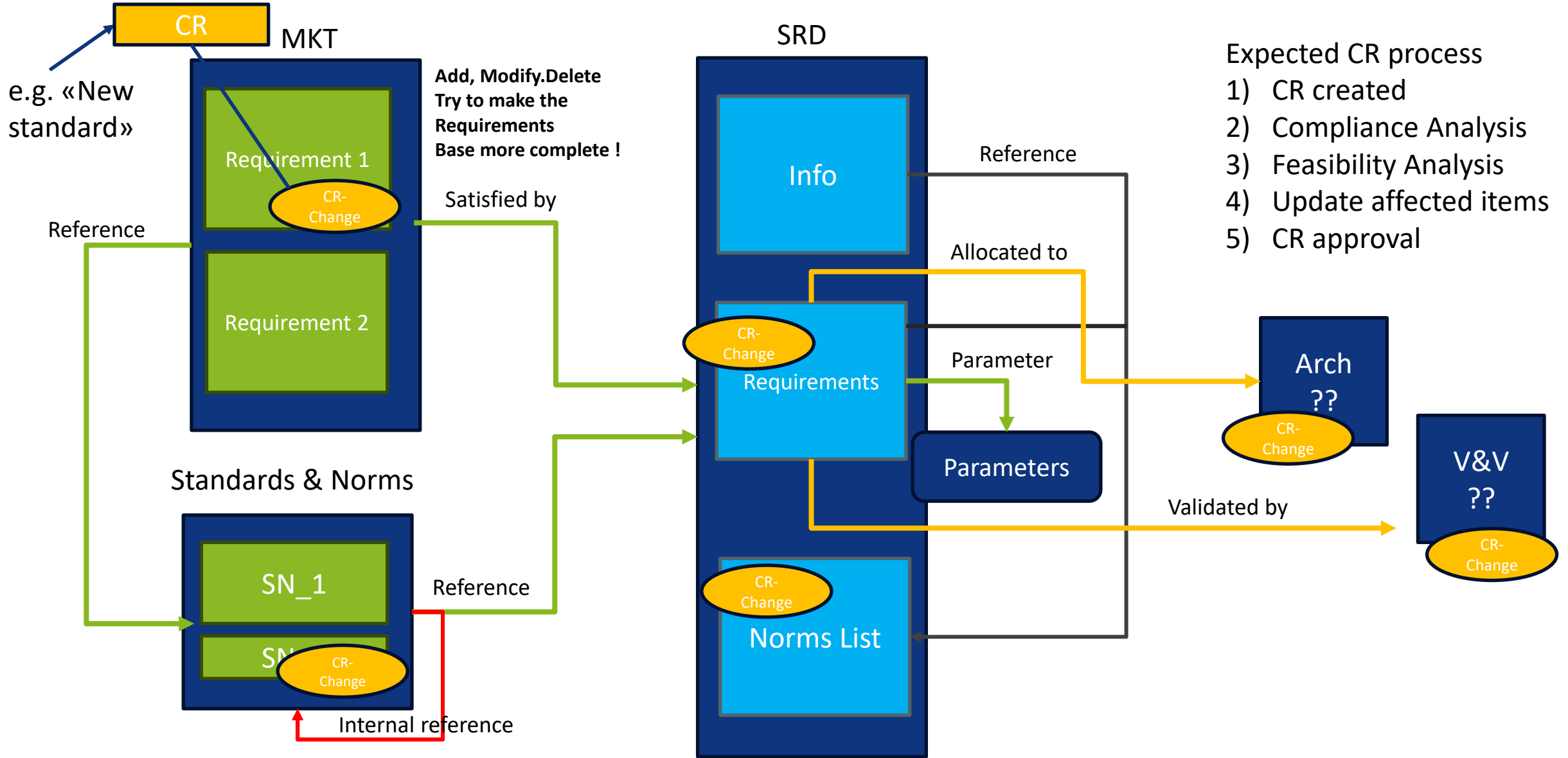
Step 2: Export item codes and copy to "transfer links" excel file "New Doc Codes" sheet

Step 3: Import links from "transfer links" excel file "Import to Visure" sheet using Visure excel import plug-in

Refer to P_R&D_MKT (Release)

REQUIREMENTS TRACEABILITY MODEL

CHANGE CONTROL – EXAMPLE: NEW STANDARD FROM MARKETING





Lorenzo Gasperi ist Requirements Engineer bei der Alpitronic GmbH in Bozen, einem führenden Unternehmen im Bereich der DC-Schnellladetechnologie für Elektrofahrzeuge. In seiner Rolle ist er verantwortlich für die Erhebung, Spezifikation und Validierung von Softwareanforderungen im Kontext innovativer Ladelösungen. Er arbeitet eng mit interdisziplinären Teams aus Produktmanagement, Systemarchitektur und Softwareentwicklung zusammen und stellt die Einhaltung internationaler Standards wie ISO 15118 und OCPP sicher. Mit einem Hintergrund in System- oder Softwaretechnik bringt er fundierte Erfahrung in modellbasierter Entwicklung und agilen Entwicklungsprozessen mit.

Der Softwareingenieur **Andreas Kreß** war in Rollen wie Start-up-Produktverantwortlicher und Requirements-Teamleiter bei kritischen Kundenprojekten in der Technologiebranche tätig. Er ist der Erfinder eines weit verbreiteten SCADA-Tools und half beim Aufbau von Methoden und Engineering-Tool-Umgebungen, von Y2K-IT-Projekten über große bundesweite Standardisierungsprogramme für Finanzsoftware bis hin zur Entwicklung von Komponenten für autonomes Fahren in der Automobilindustrie. Er ist ein Kenner vieler vertraulicher Geheimnisse der Kunst der Systementwicklung. Sein Fokus liegt auf den weiterreichenden Methoden und Werkzeugen im regulierten und sicherheitsorientierten Systems Engineering.

Varun Chinthala

Varun ist der Ansprechpartner, wenn es um komplexe Produktentwicklung und Management geht. Mit einem Masterabschluss in Systems Engineering liebt er es, knifflige Herausforderungen zu lösen und nutzt dabei moderne Methoden wie Model-Based Systems Engineering, um Lösungen zu liefern. Aber das ist noch nicht alles! Bevor er in die Welt des Systems Engineering eingestiegen ist, hat Varun seinen Bachelor in Maschinenbau gemacht und zwei aufregende Jahre in der schnelllebigen Automobilbranche verbracht. Diese einzigartige Mischung aus mechanischem Know-how und systemischem Denken macht ihn besonders und erlaubt ihm, Probleme aus verschiedenen Blickwinkeln anzugehen.



SYSTEM DEVELOPMENT LIFECYCLE NEW PRODUCT DEVELOPMENT

