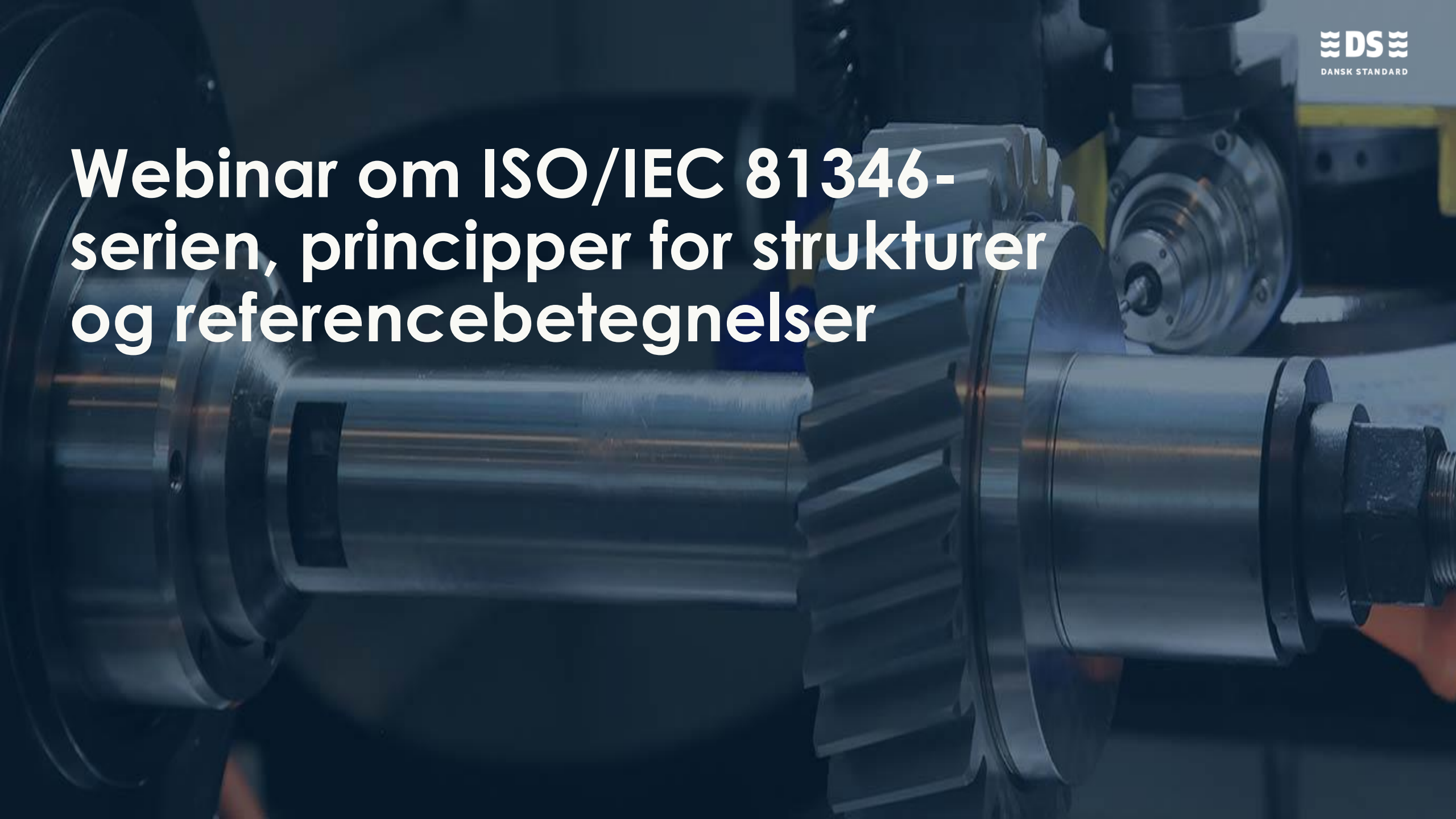


Webinar om ISO/IEC 81346-serien, principper for strukturer og referencebetegnelser

Om Dansk Standard

Hvem er Dansk Standard

- Danmarks officielle standardiseringsorganisation
- Erhvervsdrivende fond, grundlagt i 1926
- 204 medarbejdere (juli 2024)
- 240 nationale spejlkomitéer (S-udvalg)
- 2300 eksperter
- DS er en enhedsorganisation

Vi er medlem af:

En stærk platform af solide brands:

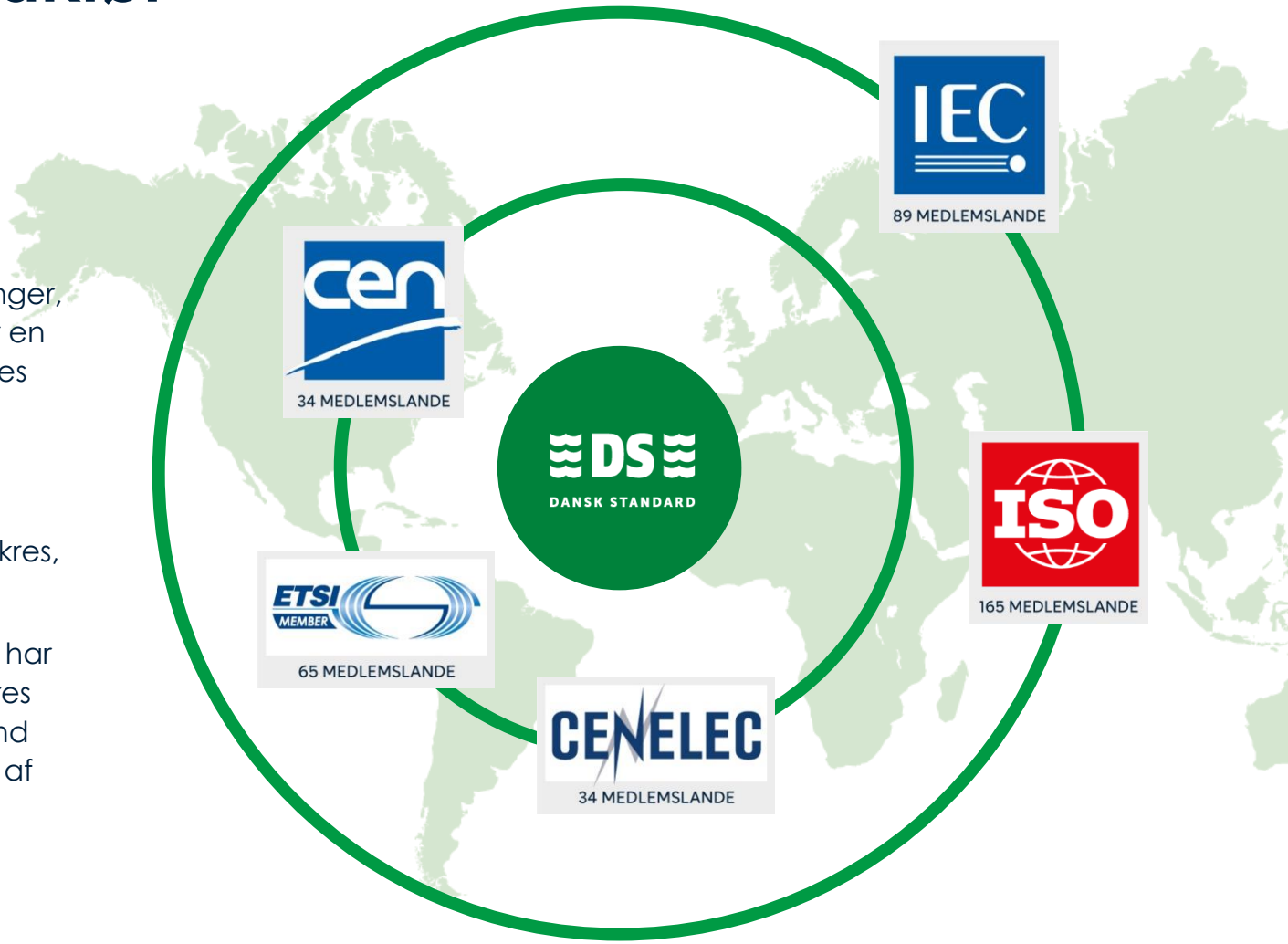
Standardiseringsudvalg

Dansk Standard – en stærk aktør i et europæisk og globalt standardiseringsnetværk

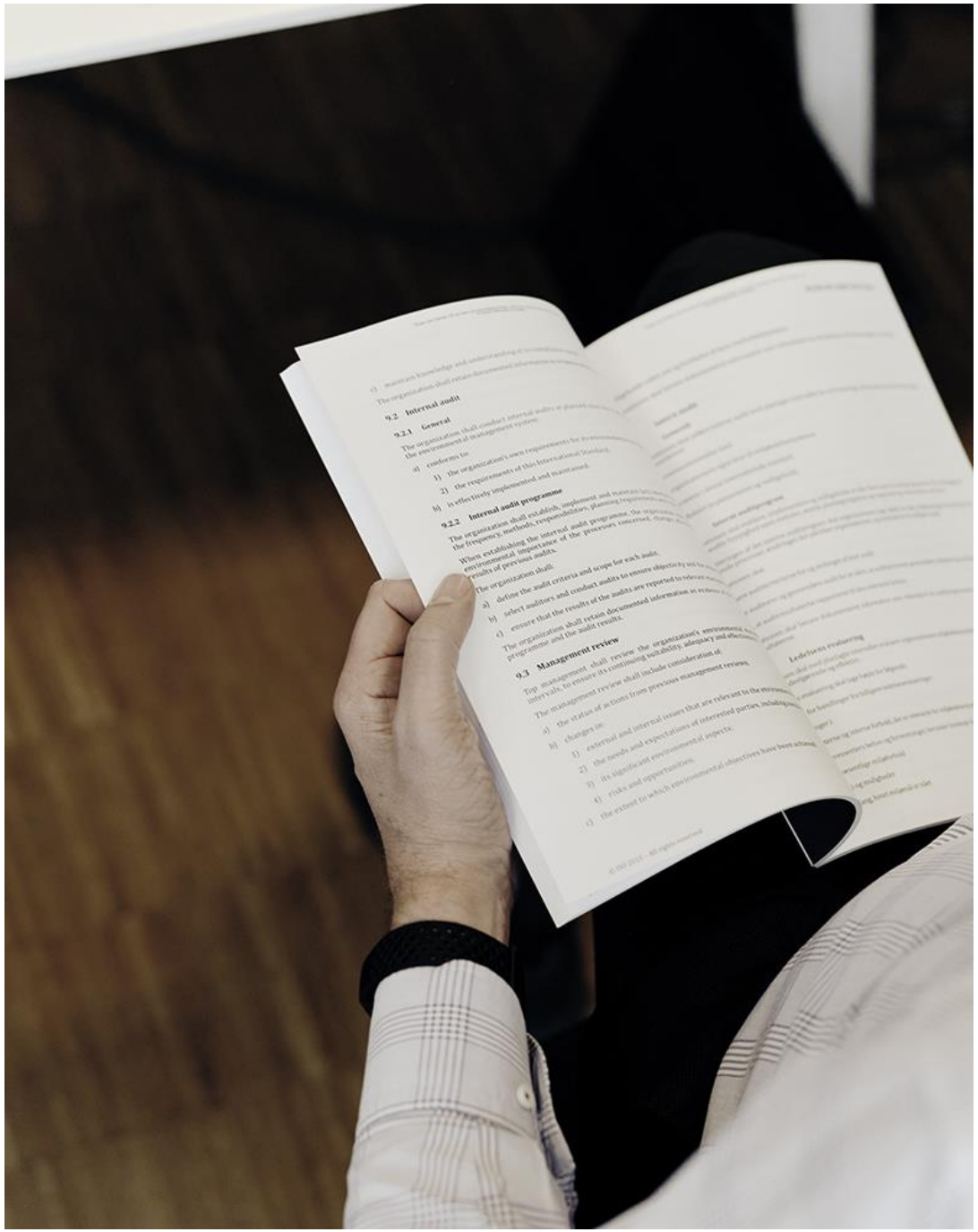
Behovet for en fælles indsats, der kan skabe bæredygtige løsninger, har aldrig været større. For at sikre kompatibilitet i løsningerne er en del af svaret, at udvikling af nye teknologier og produkter baseres på internationale standarder.

Den internationale standardiseringsverden har stort fokus på at understøtte udviklingen af standarder, der kan tale sammen på tværs af landegrænser. Dette skal styrkes og samtidig skal det sikres, at nye løsninger imødegår verdens klimamæssige udfordringer.

Danske virksomheder, som anvender internationale standarder, har lettere adgang til verdensmarkedet og kan dermed bevare deres styrkeposition på teknologiområder som fx grøn energi, vind/vand og robotteknik og dermed være med til at bidrage til løsningen af de fælles globale klimaudfordringer.



Medlemskabet af Dansk Standards udvalg er din indgang til internationalt samarbejde



Standarder dækket af S-503

IEC/TC 3 – Documentation, graphical symbols and representation of technical inoformation

- Publication (44 standarder)
- Work Programme (15 aktive projekter)
- Structure
- ISO/TC 10 – Technical Product Documentation (152 standarder og 18 aktive projekter)
- ds.dk/S-503

Medlemmer i S-503

- Systems Engineering A/S
- Eplan Software & Service Danmark
- Siemens Gamesa Renewable Energy A/S
- PC SCHEMATIC A/S
- Vestas Wind Systems A/S


DS
DANSK STANDARD

REFERENCE DESIGNATION SYSTEM

ISO/IEC 81346 Standard Series

Dansk Standard Webinar

Marts 2025

It's all about creating a common language™

WHO WE ARE

We are experts in systems engineering

Philip Holmbjerg Kristiansen
BSc Eng
Associated Systems Engineering
Professional

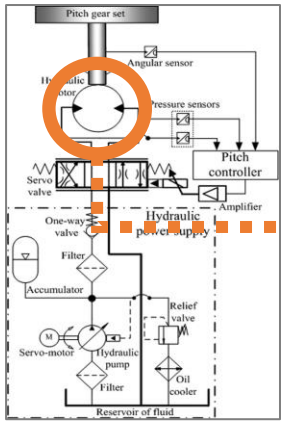
AGENDA

1. Welcome & practical information *10:00 – 10:05*
2. RDS 81346 Training and values *10:05 – 10:50*
3. Parts of the 81346 standards *10:50 – 11:10*
4. Q&A *11:15 – 11:30*

INFORMATION MODELS

The problem: Exchanging information across silos

The solution: A reference point in a common reference model



Process engineering

Mechanical engineering

SME

Working group

Fingers crossed

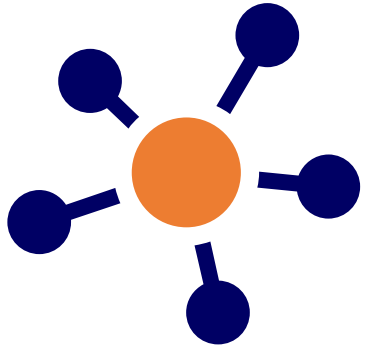
The reference model

WHAT YOU USE IT FOR

The RDS 81346 reference model has multi purpose usage…

Capture information

Validate information



Share information

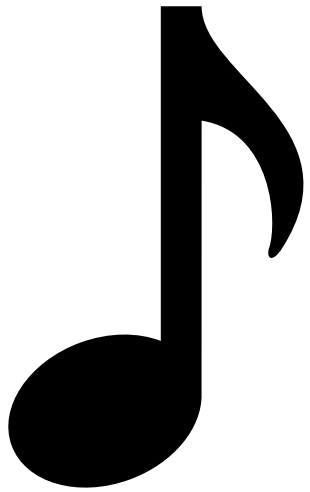
RDS
Reference Designation System

ISO/IEC **81346** Standard Series

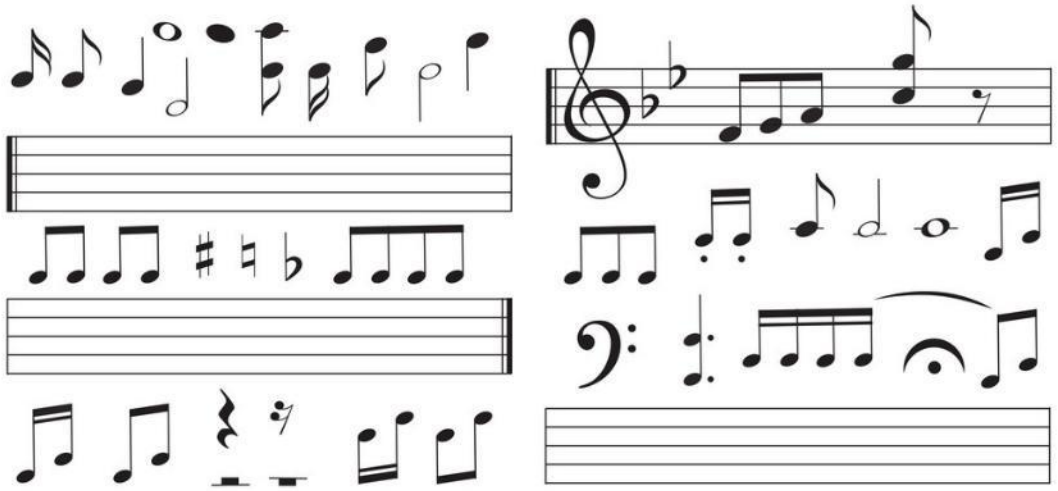
Industrial systems, installations and equipment and industrial products

THE MISSION

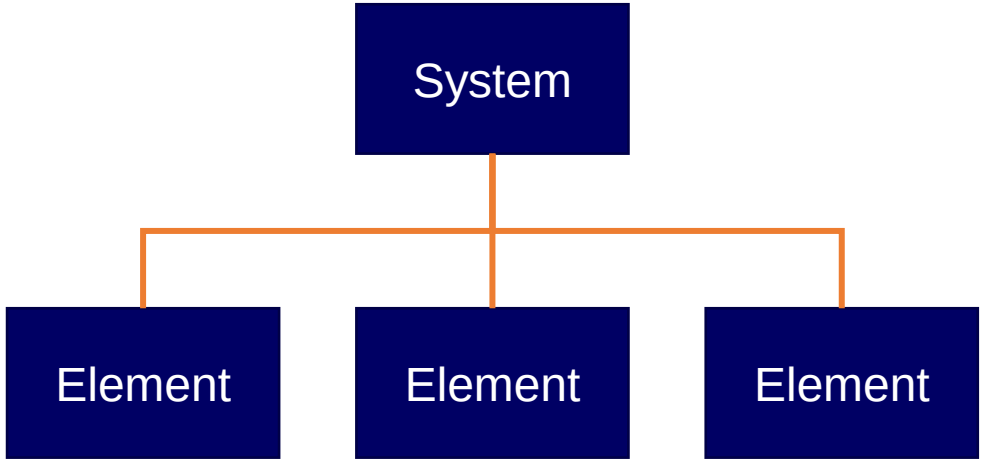
a common language



THE COMMON LANGUAGE

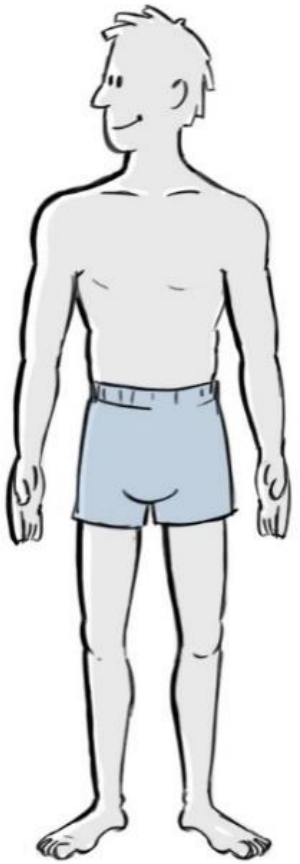


=	Functional aspect
-	Product aspect
+	Location asepct
%	Type aspect



It’s all about creating a common language™

THE PREMISE: SYSTEMS THINKING

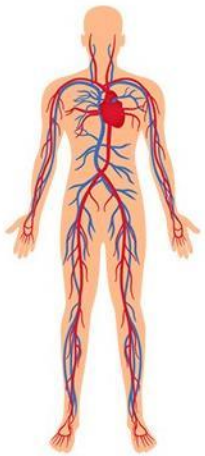


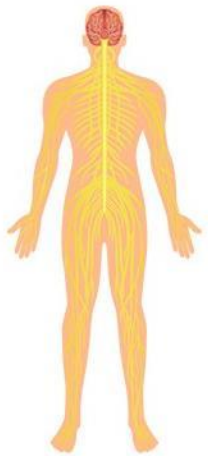
THE HUMAN BODY CONSIST OF 11 SYSTEMS

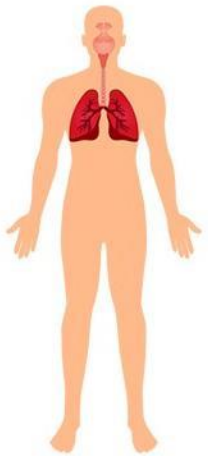

Integumentary System

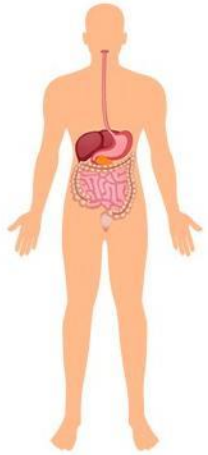

Muscular System

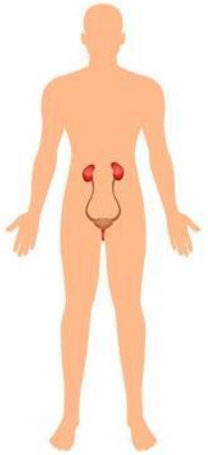

Skeletal System

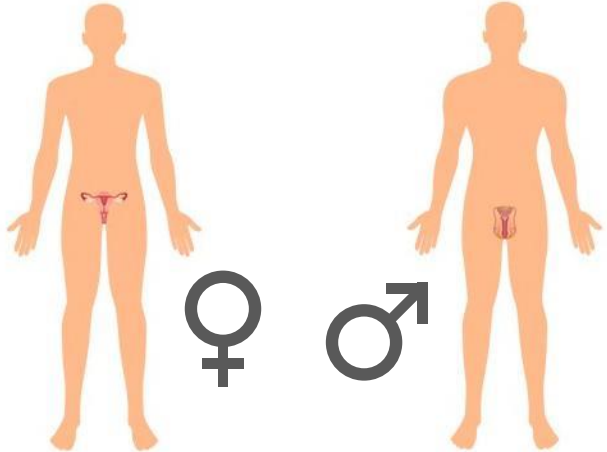

Cardiovascular System

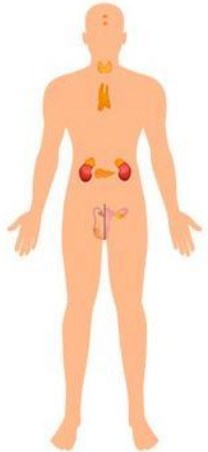

Nervous System


Respiratory System


Digestive System


Urinary System


Reproductive System


Endocrine System

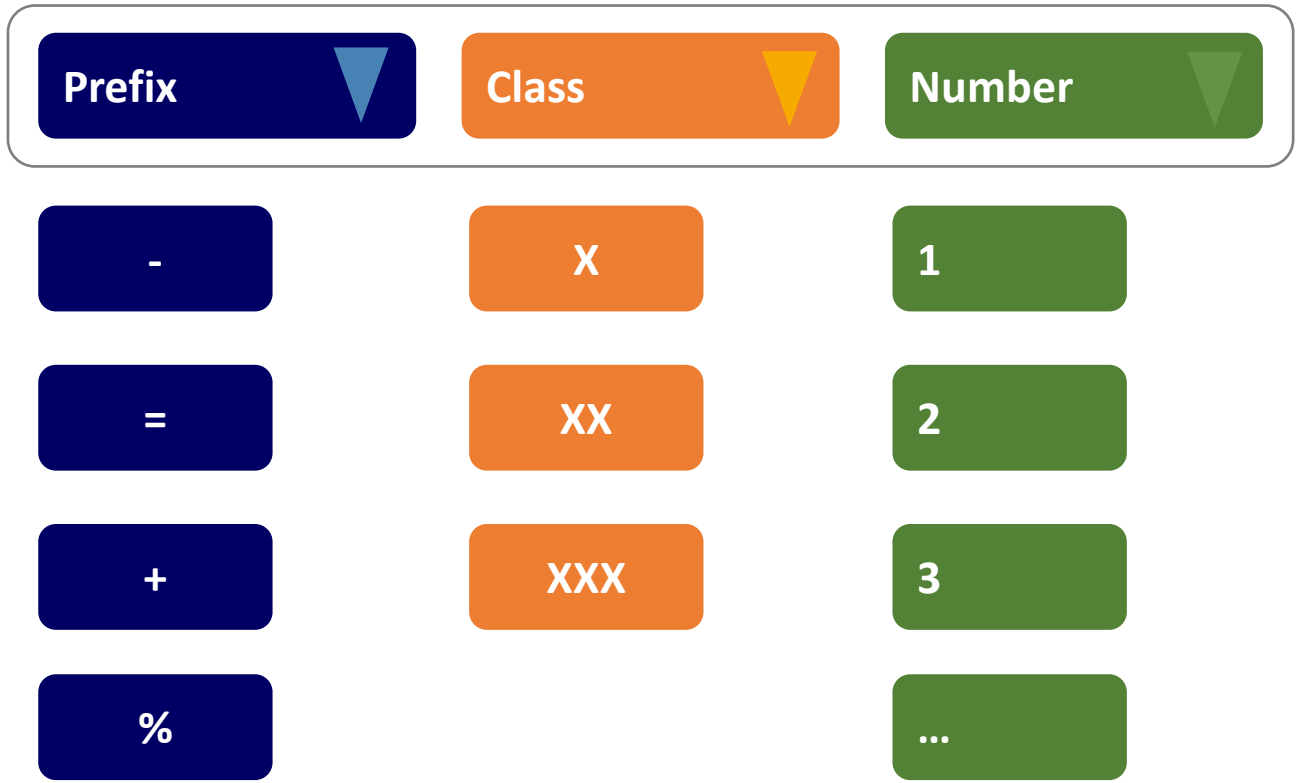

Lymphatic/Immune System

https://thebeakerlife.com/homework-helper-body-systems-7ec96976ab7b

RDS SYNTAX

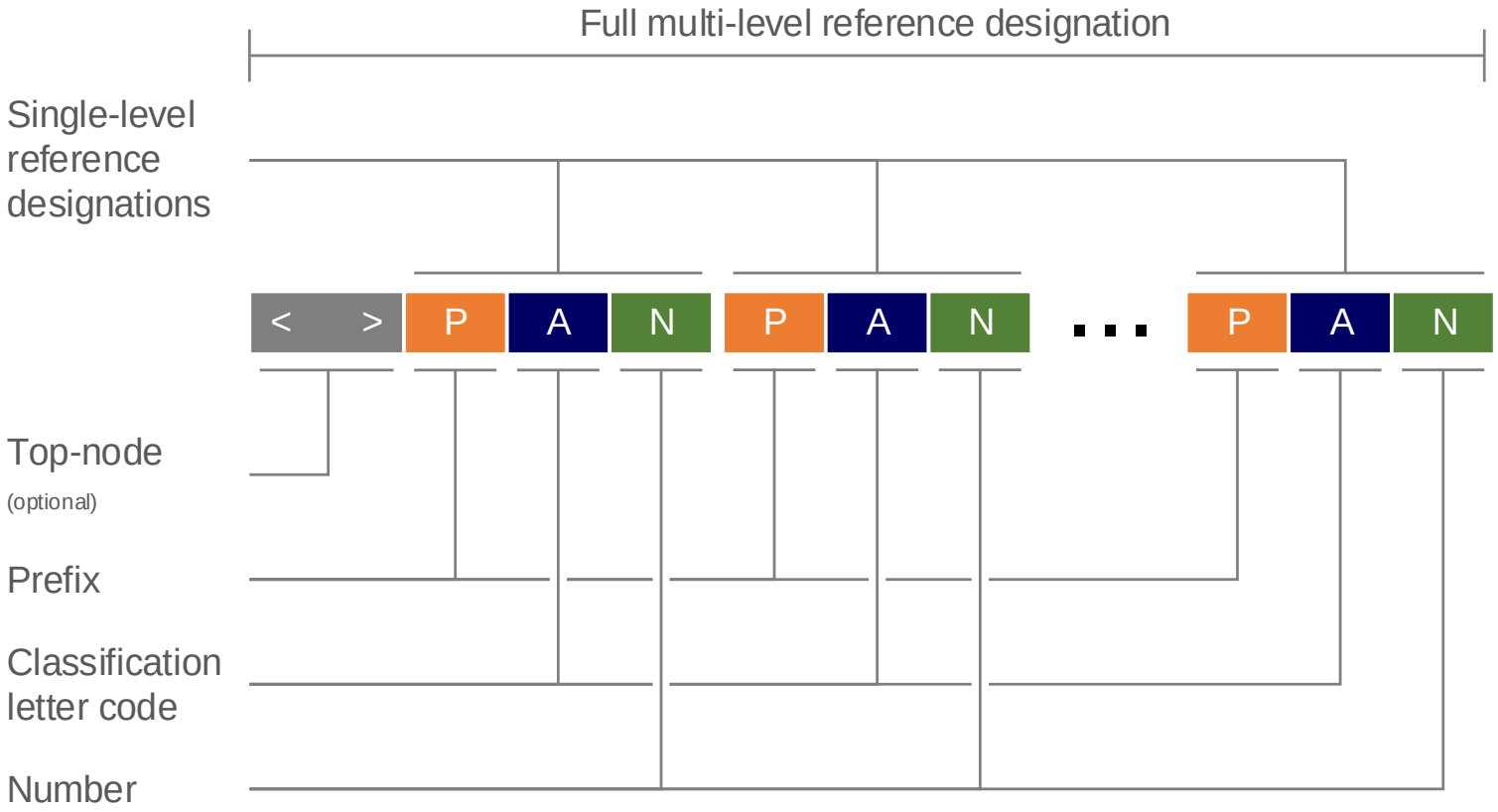
%ULE4
=QMA5
+8
-RNC2

RDS SYNTAX



Reference designation **= QM 3**

MULTI-LEVEL REFERENCE DESIGNATION



RDS reflects the system breakdown – this means no FIXED RDS structure!

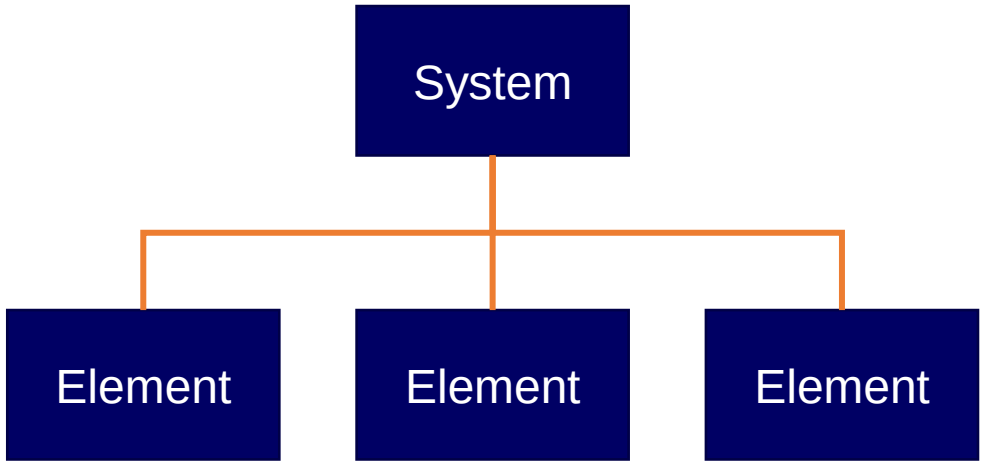
THE THREE CORE ELEMENTS OF RDS

Structure — How system elements are related (part-of relations)

Classification — What kind of system elements (type-of relations)

Aspect — How the system is viewed

RDS is Structure, Aspect & Classification



STRUCTURE

Organizing Complexity

So you can recognize objects within and across aspects

Cabin system

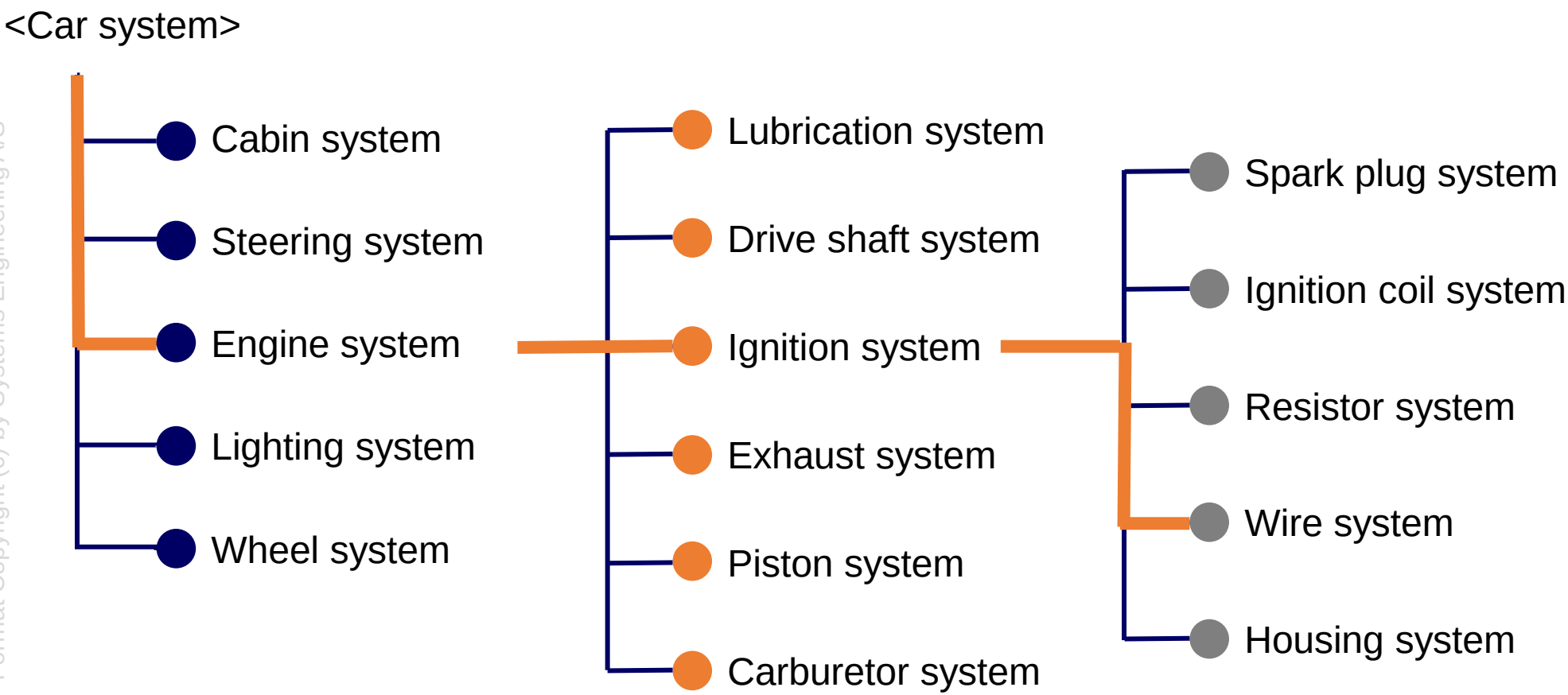
Steering system

Engine system

Lighting system

Wheel system

HOW DOES A SYSTEM WORK



CLASSIFICATION

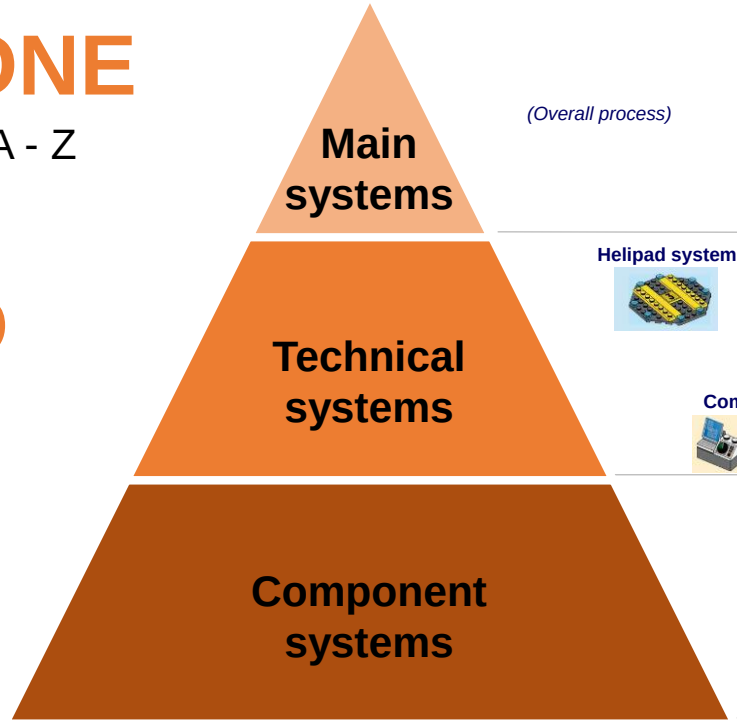
How ISO/IEC 81346 classifies systems and system elements

SYSTEM OF SYSTEMS

ONE
A - Z

TWO
AA - ZZ

THREE
AAA - ZZZ



LEGO products

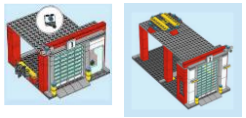
LEGO CITY: Fire station (60125)

LEGO CITY: Police station (7498)

LEGO CITY: Fire truck (7239)

(Overall process)

Vehicle storage system



Facility system

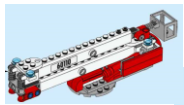
Mobile extinguishing system

Helipad system

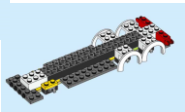
Revolving door system

Gate system

Staircase system

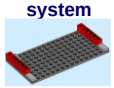


Baseframe system



Communication sytem

Foundation system



Fire pole system

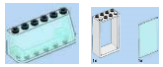
Cabin system

Staircase

Gate

Cable drum

Window



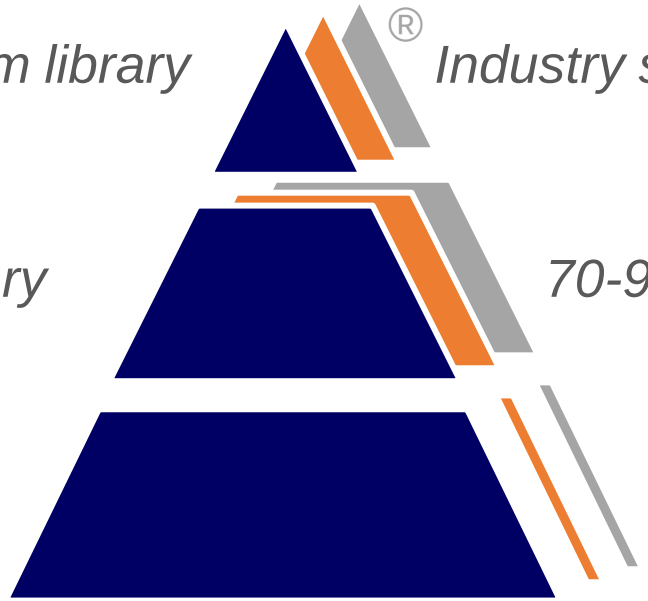
Roof

Pump

Wheel

THE RDS SYSTEM LIBRARY

Aspects



Main system library

Industry specific

Technical system library

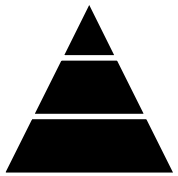
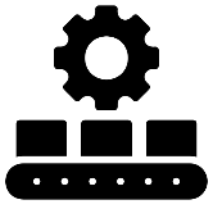
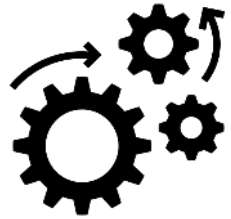
70-90% reuse across industries

81346-2 table 3

99,9% reuse across industries

THE RDS SYSTEM LIBRARIES

Different tables for different industries

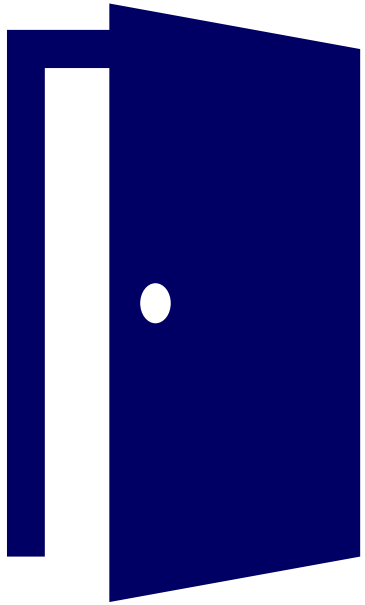
General classification	Power systems	Construction works	Manufacturing	Vehicles	Processes
					
Part ***2***	*Part* ***10***	*Part* ***12***	*Part* ***14***	*Part* ***20***	*Part* ***50***

RDS CLASSIFICATION SYSTEM

A door is a door!

1

… with many properties!



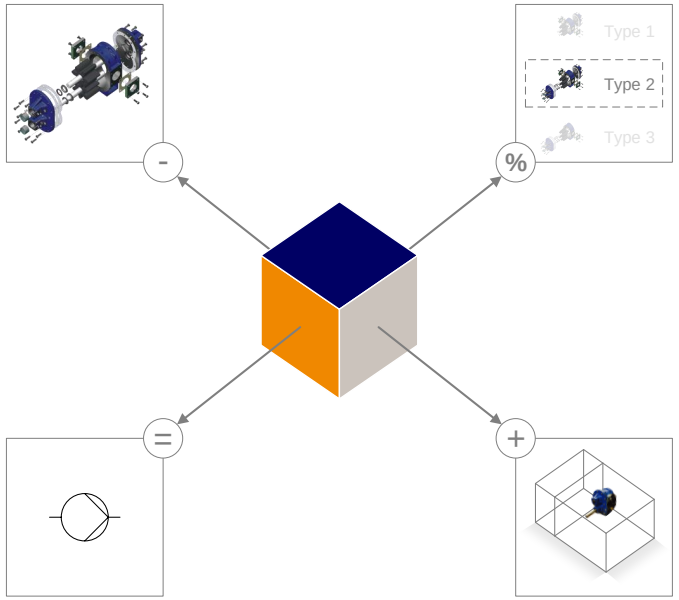
CLASSIFICATION – “A DOOR IS A DOOR”

81346-2 (2019)

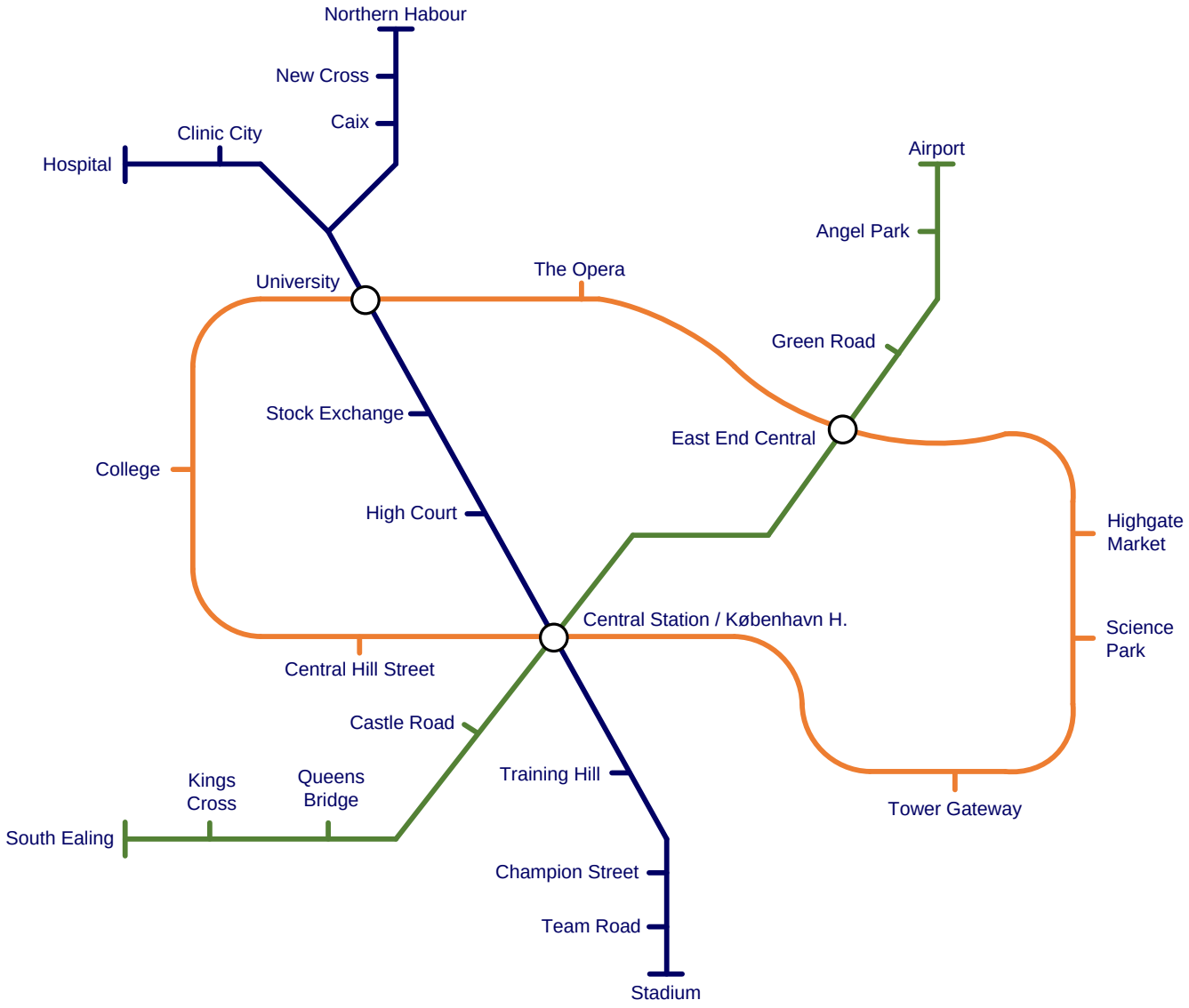
Class	**QQC**
Definition	*space access object* for use by upright persons
Class name	Door
Synonyms	entrance, exit, …
Properties	Material: Glass, wood, steel, … Width: 600...2500mm Height: 2000…2500mm

User specified

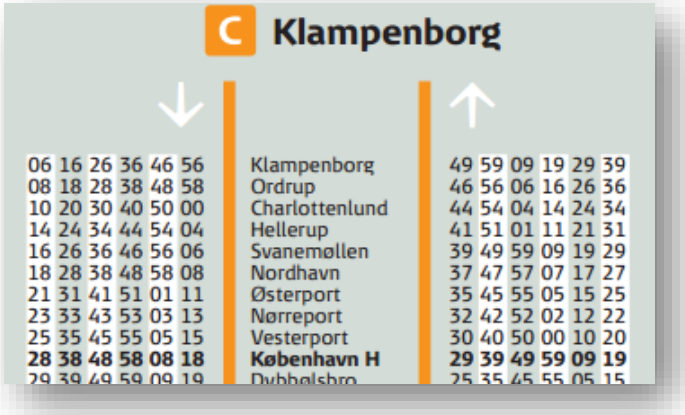
ASPECTS

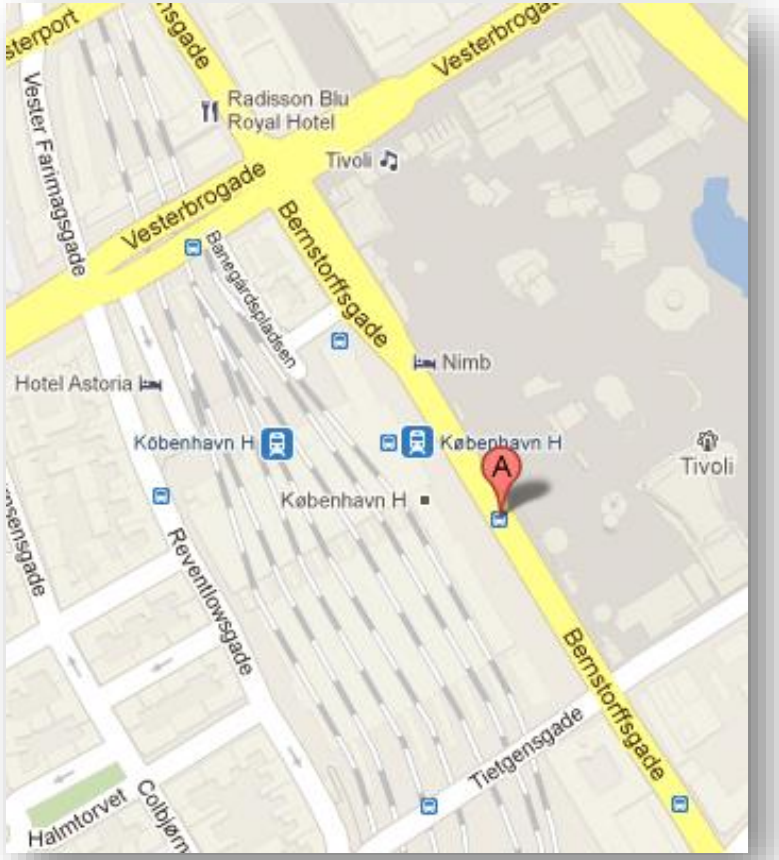


ASPECTS – A WAY OF VIEWING THE WORLD



ASPECTS – A WAY OF VIEWING THE WORLD



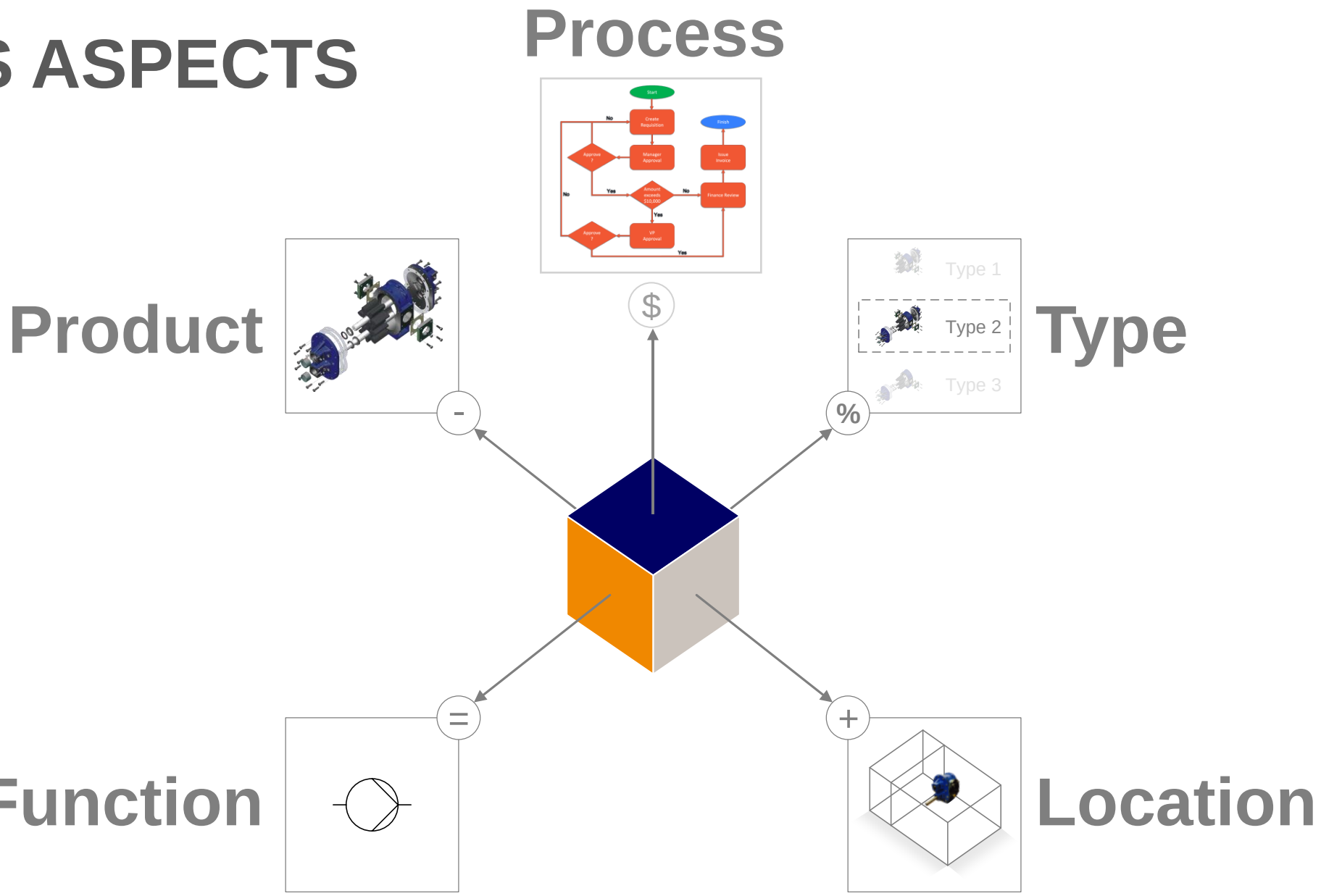


THE FOUR RDS ASPECTS

Structuring based on…

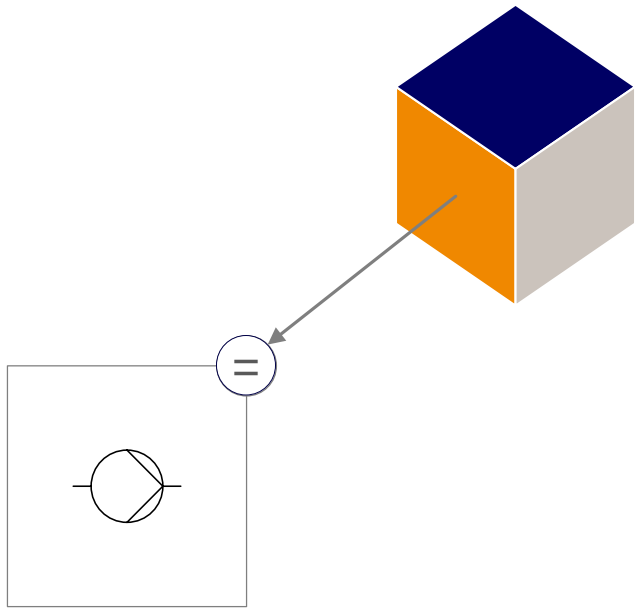
Function	what a system is designed to do
Product	how the system is built
Location	the intended or actual location of the system
Type	the commonality of systems with common properties
Process	the action an object executes or participates in

RDS ASPECTS



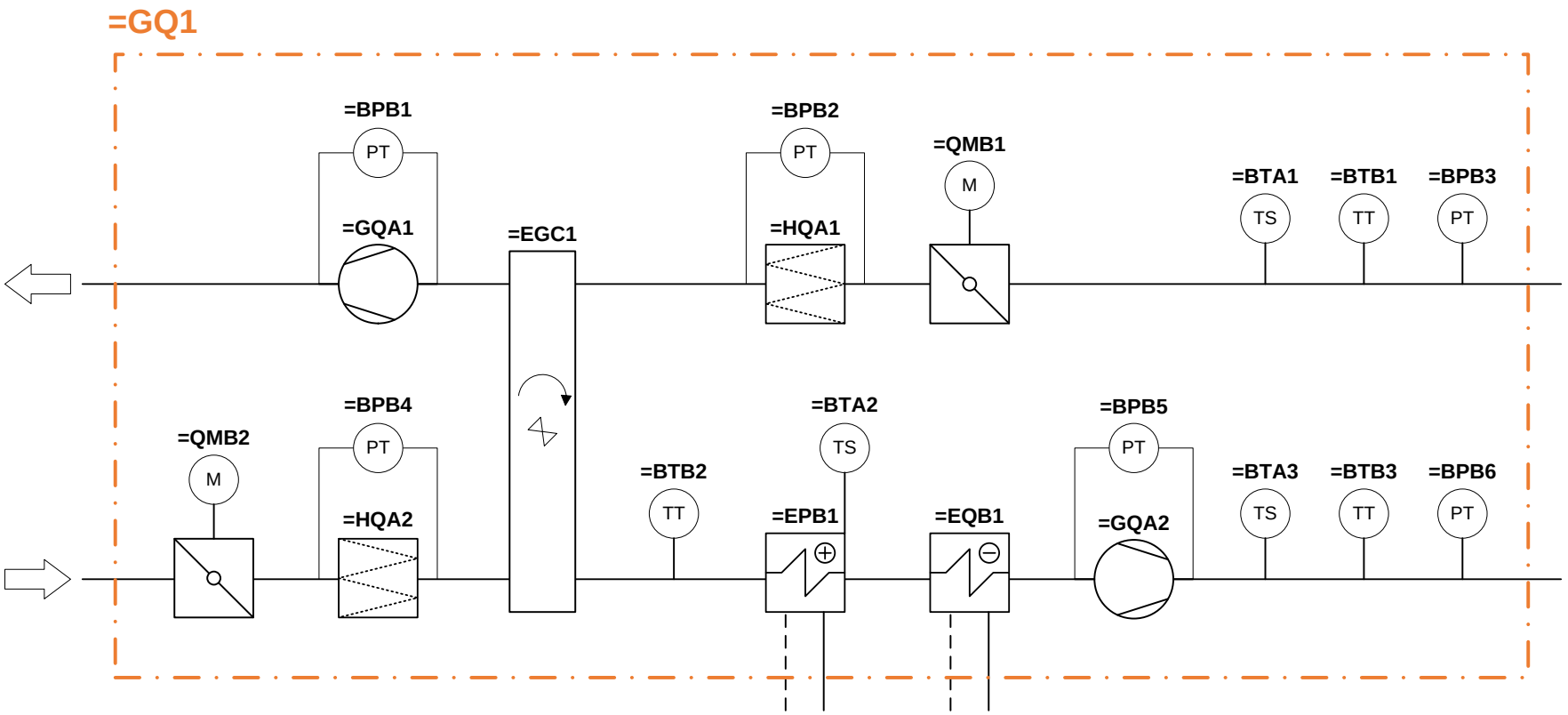
RDS ASPECTS - FUNCTION

what a system is designed to do



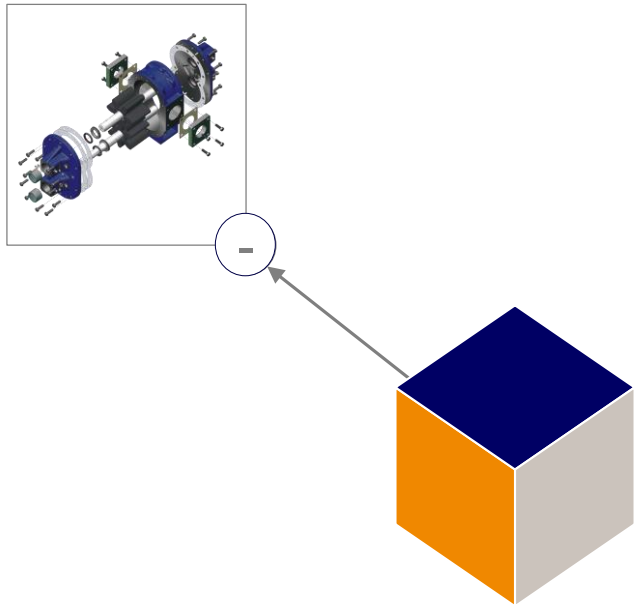
RDS ASPECTS - FUNCTION

what a system is designed to do



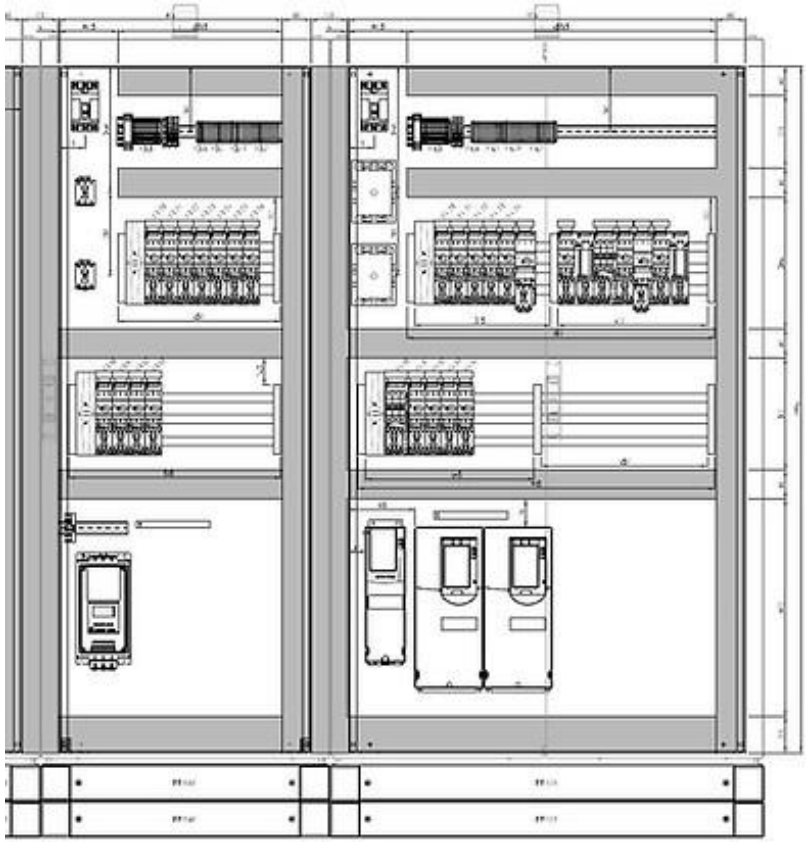
RDS ASPECTS - PRODUCT

How the system is built



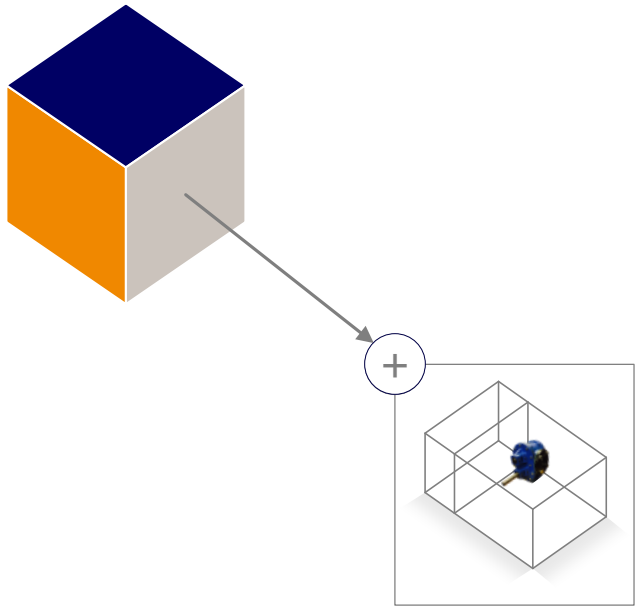
RDS ASPECTS - PRODUCT

- **-UCA1** Cabinet system
  - **-QAB1** Circuit breaker
  - **-KFA1** Relay
  - **-QAA1** Contactors
  - **-FCA1** Fuses
  - **-RBA1** UPS



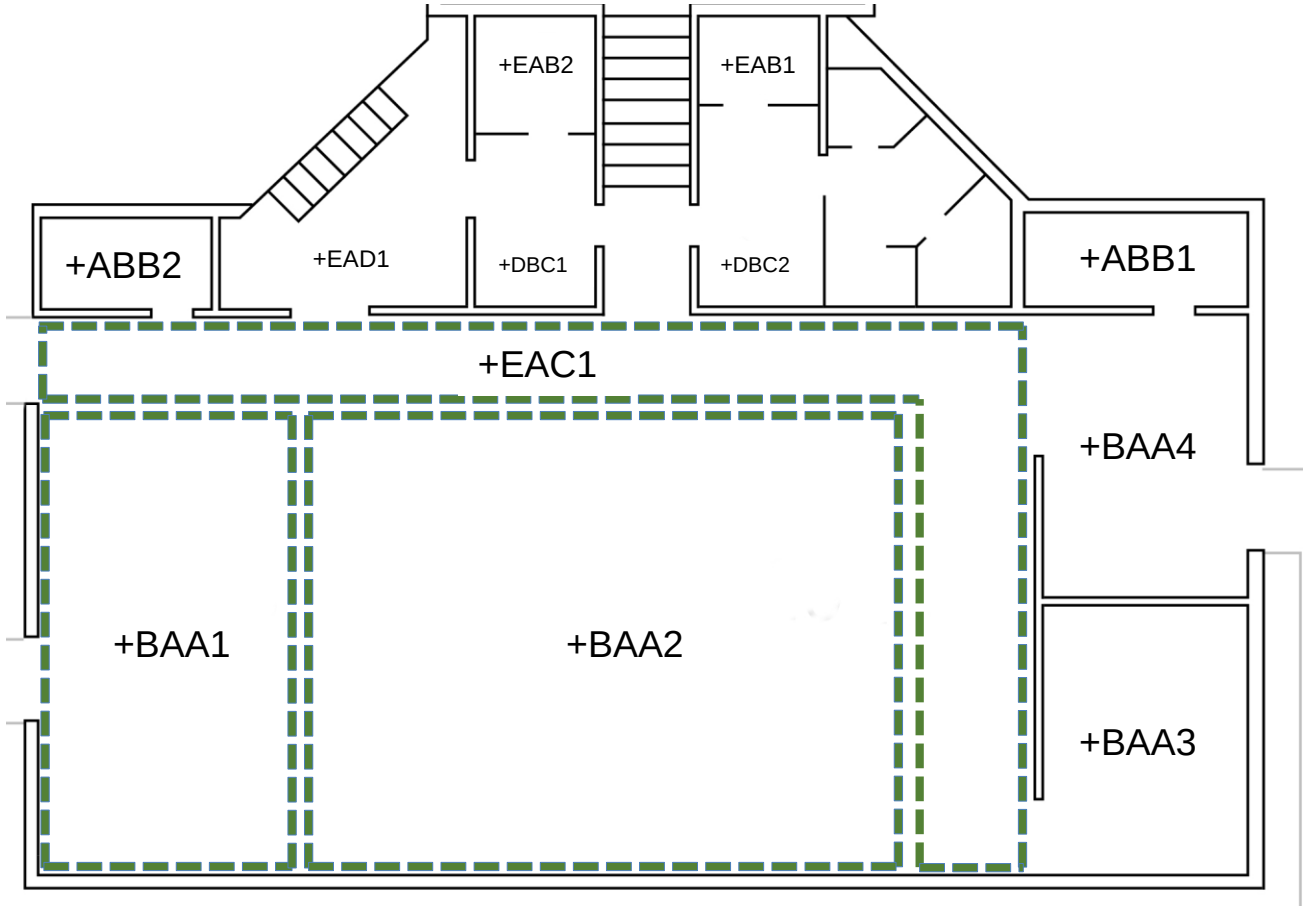
RDS ASPECTS - LOCATION

the intended or actual location of the system



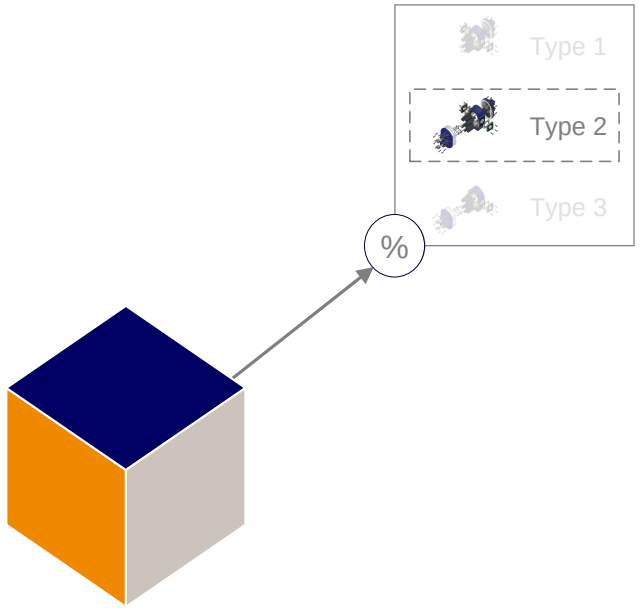
RDS ASPECTS - LOCATION

the intended or actual location of the system



RDS ASPECTS - TYPE

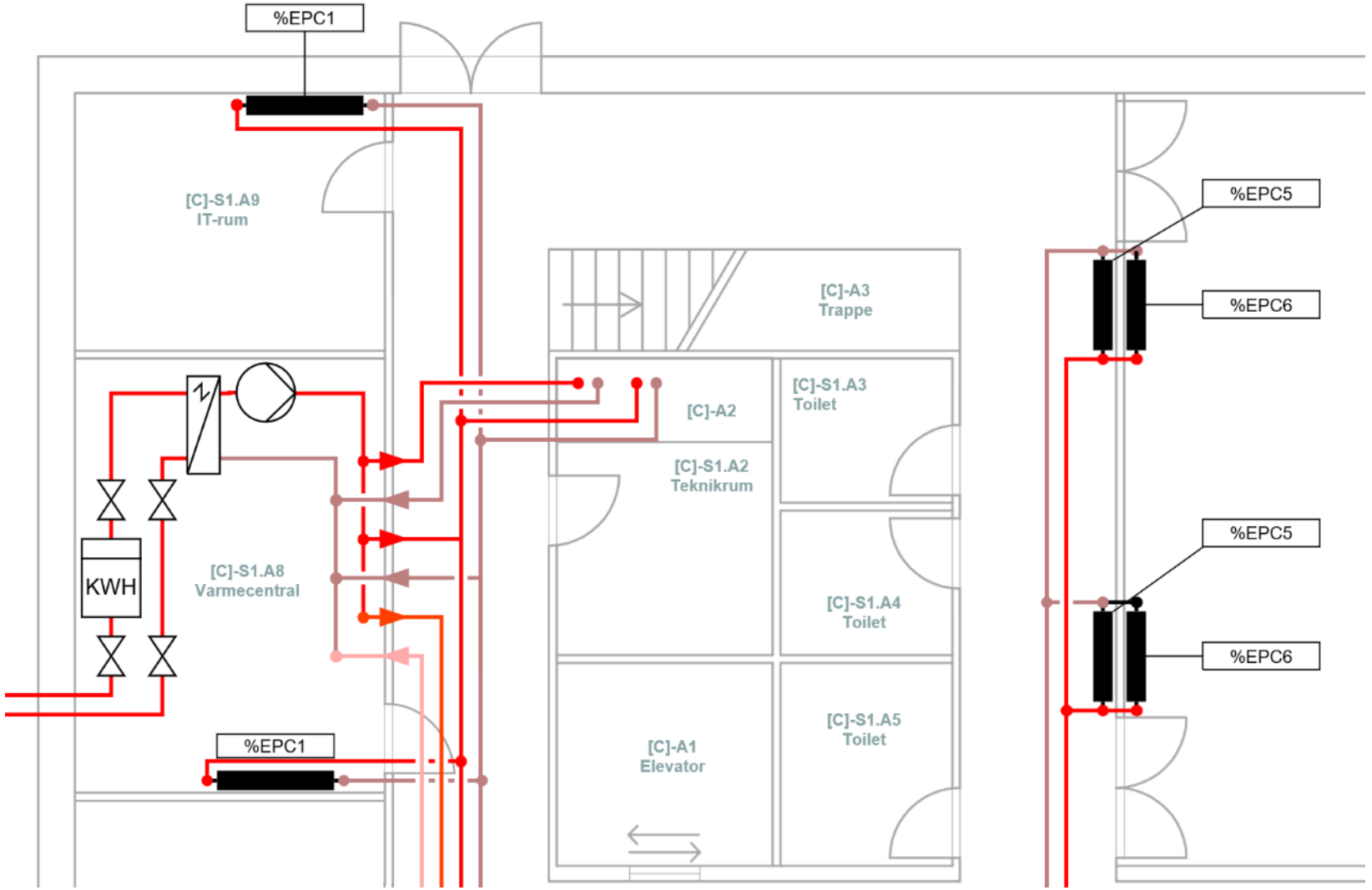
the commonality of systems with common properties



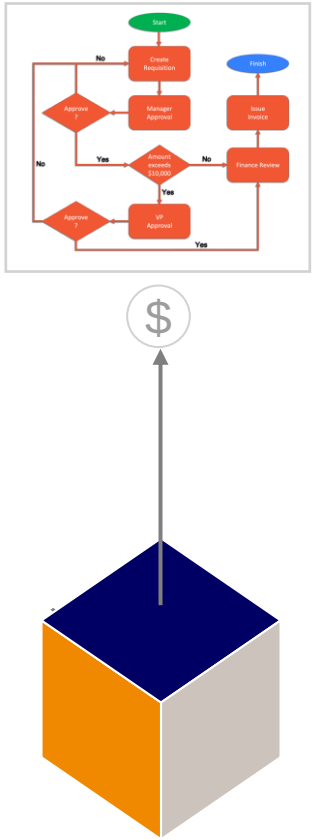
RDS ASPECTS - TYPE

the commonality of systems with common properties

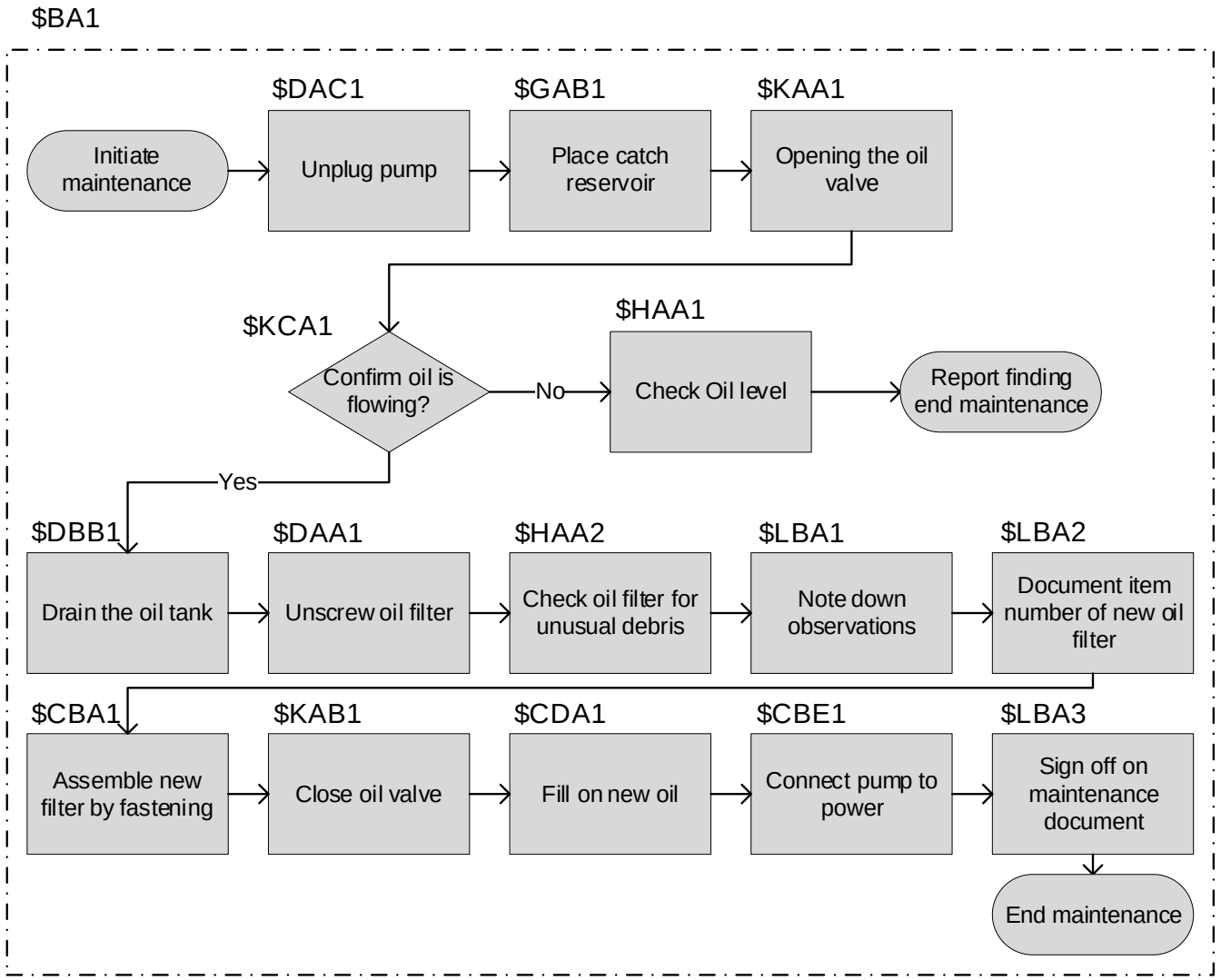
%

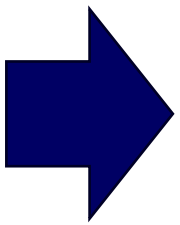


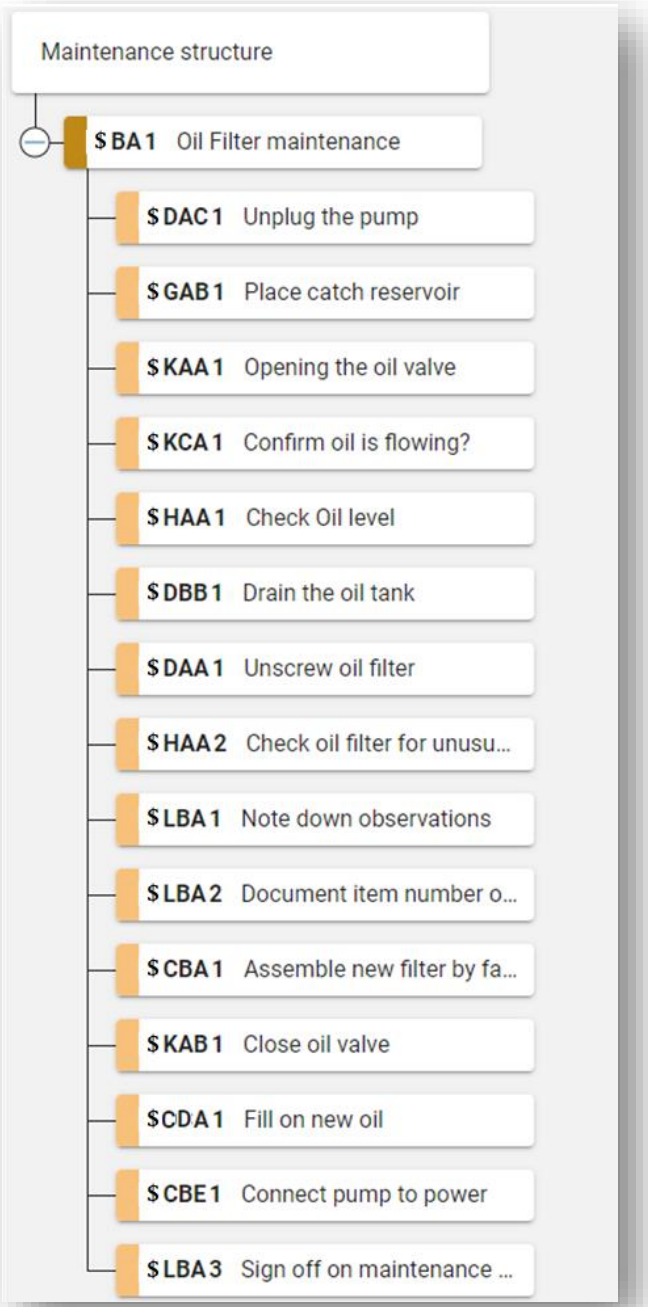
PROCESS ASPECT



PROCESS ASPECT

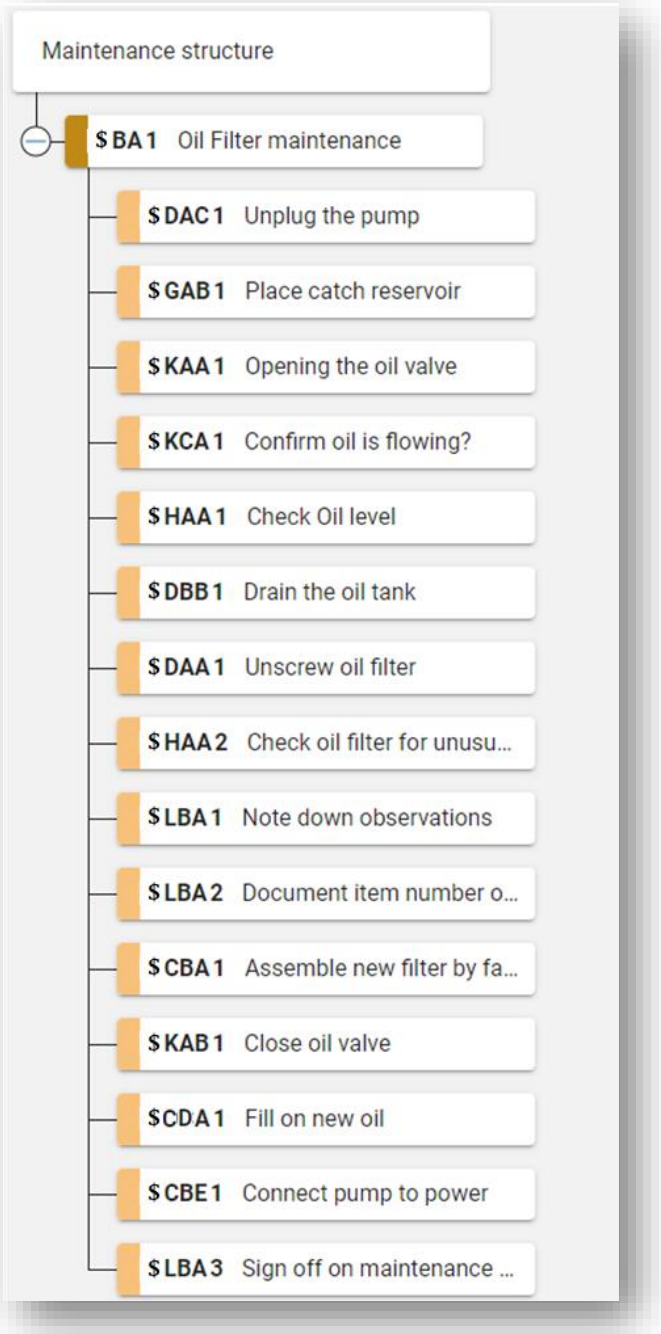






PROCESS ASPECT

- Maintenance structure
- Standard operation procedure
- Generic pricing of projects
- Generic scheduling



NEW APPROACH TO ASPECTS

How to interpret double aspect in the reference designation

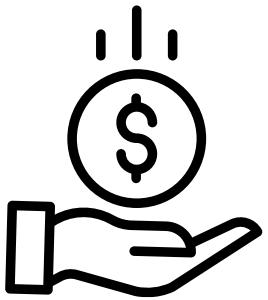
- Product breakdown
  - **-ABC1** Contact
  - **-MAA1** Motor
  - **-BHC1** Cable
  - **-QMA1** Valve
  - **-BHB1** Sensor
  - **-NCA1** Casing
- Function breakdown
  - **=KMA1** Control system
  - **=WGA1** Connection system
  - **=MAA1** Motor system
  - **=MAA2** Backup motor system
- Location breakdown
  - **+GFF1** Control Room
  - **+LKA1** Canteen
  - **+GFF2** Technical area
  - **+UJJ1** Office
  - **+HJA1** Machine room

WHY RDS MATTERS

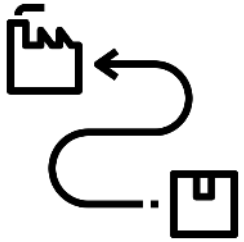
A well-implemented RDS is the backbone of successful design projects, delivering clarity, efficiency, and cost savings from start to finish

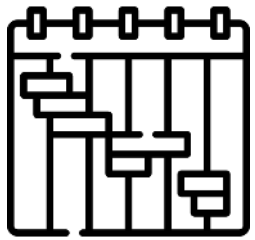
REFERENCE DESIGNATION SYSTEM IS AN INVESTMENT

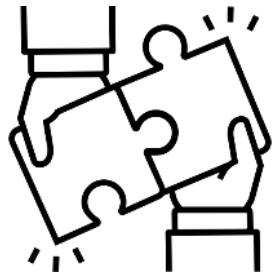
Cost reduction!



- Clarity and communication
- Enhanced traceability
- Efficient project management
- Troubleshooting and maintenance
- Collaboration

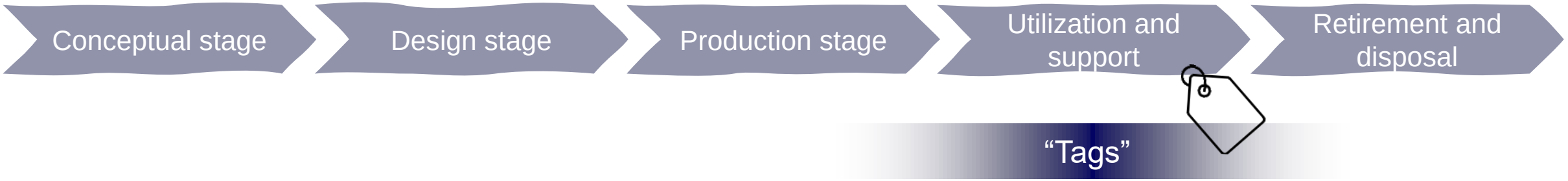






CREATING A SYSTEM ARCHITECTURE

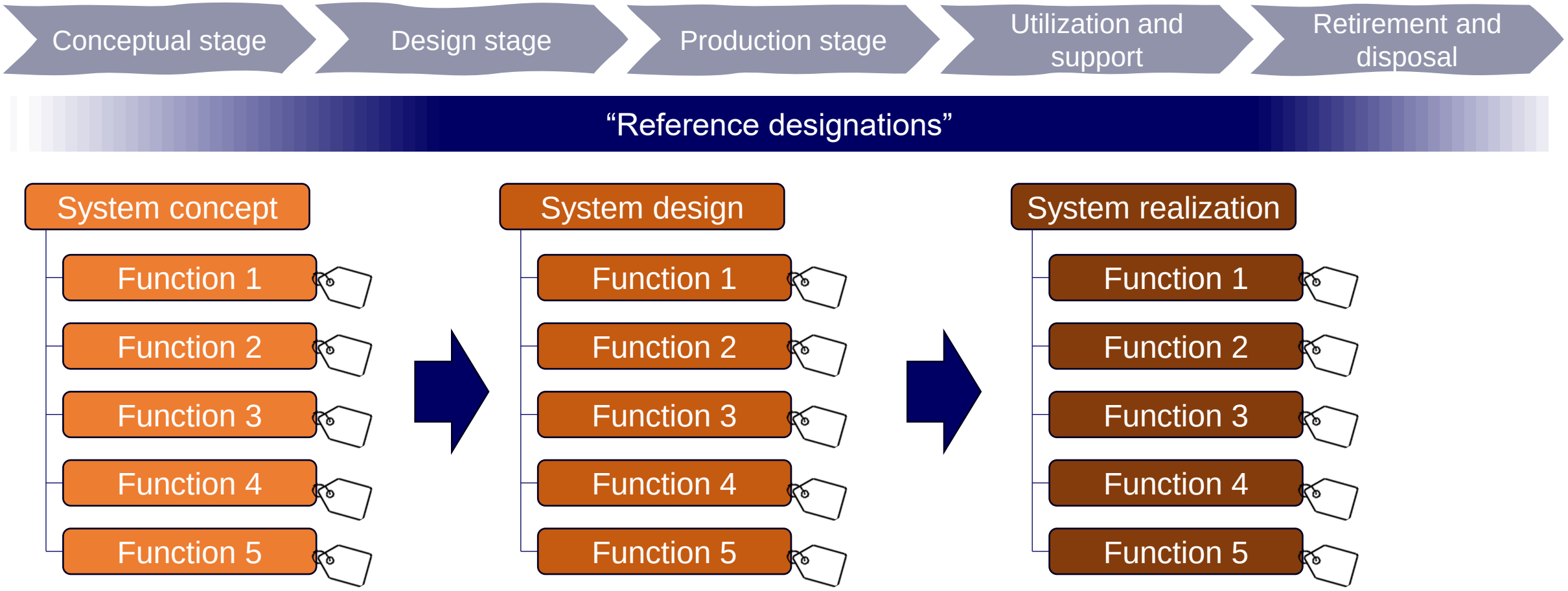
For any project



“Reference designations”

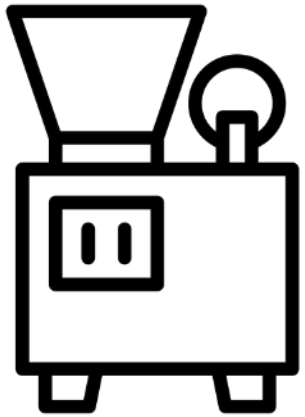
CREATING A SYSTEM ARCHITECTURE

For any project



CREATING A SYSTEM ARCHITECTURE

For any project



System breakdown structure

- Process machine
  - **=K1** Electrical system
  - **=H2** Heater system
  - **=L1** Transport system
  - **=M1** Control system
  - **=N1** Storage system

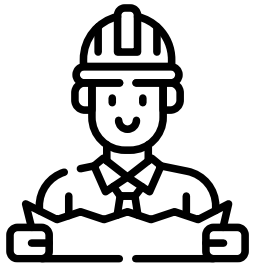
RDS IN INTERFACE CONTROL

System thinking and a common language reduce complexity in big designs

- Process machine
  - **=K1** Electrical system
    - **=KH1** Transformer system
    - **=JK1** HV Cable system
  - **=H2** Heater system
    - **=HG1** Heater element
    - **=LA1** Heat control
  - **=L1** Transport system
  - **=M1** Control system
  - **=N1** Storage system

Electrical system responsible

Heating system responsible



Storage system responsible

Overview and

Clarity in design

RDS IN INTERFACE CONTROL

System thinking and a common language reduce complexity in big designs

- Process machine
  - **=K1** Electrical system
    - **=KH1** Transformer system
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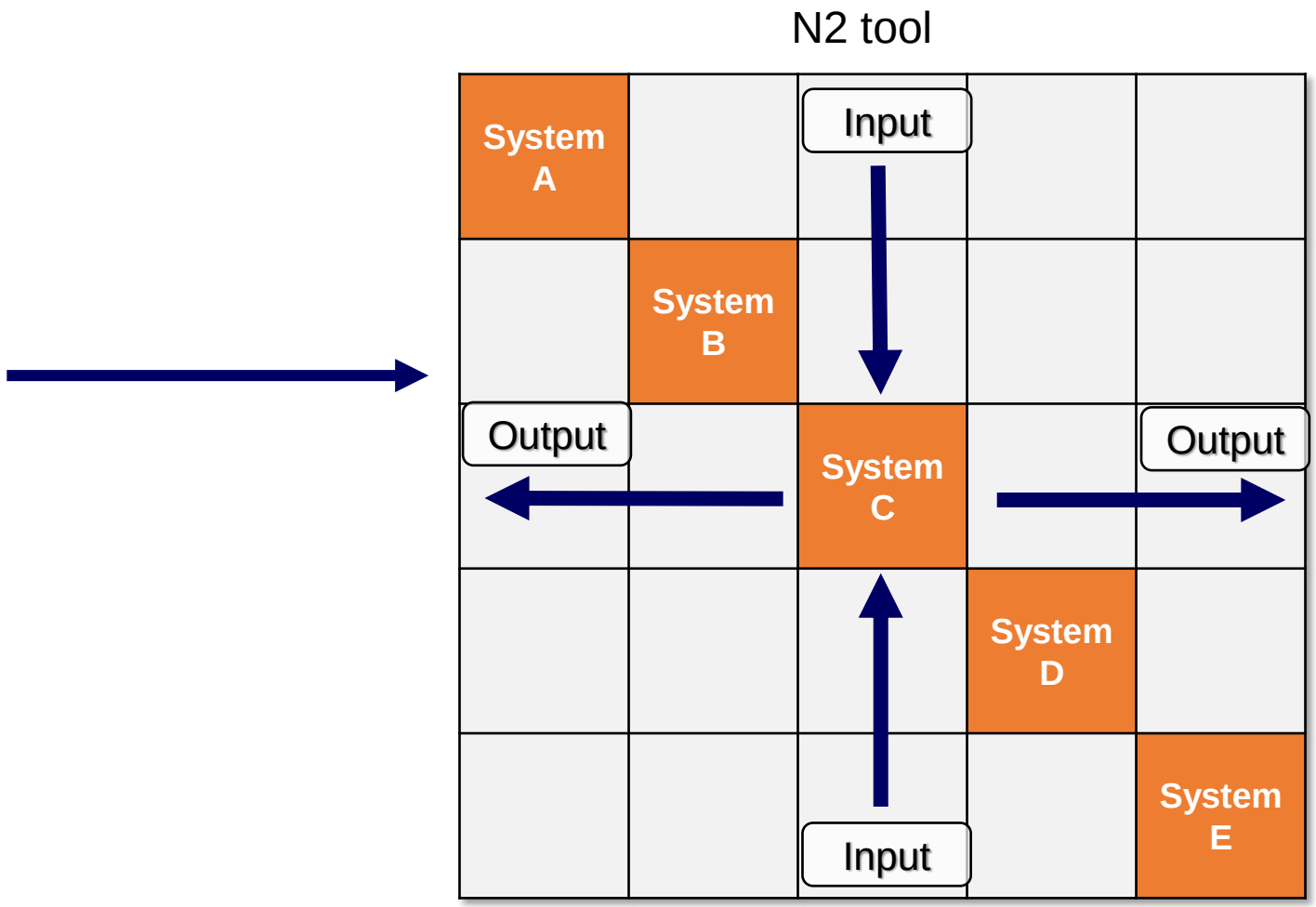
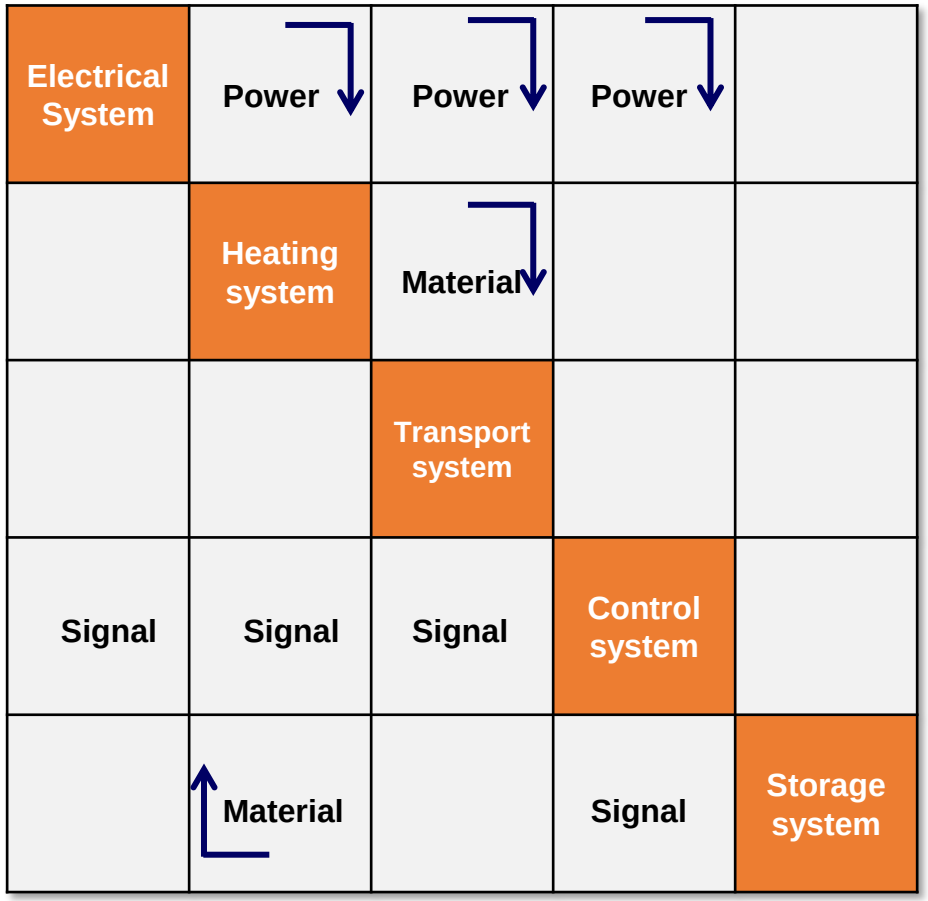


SYSTEMS INTERRELATION

Interface monitoring



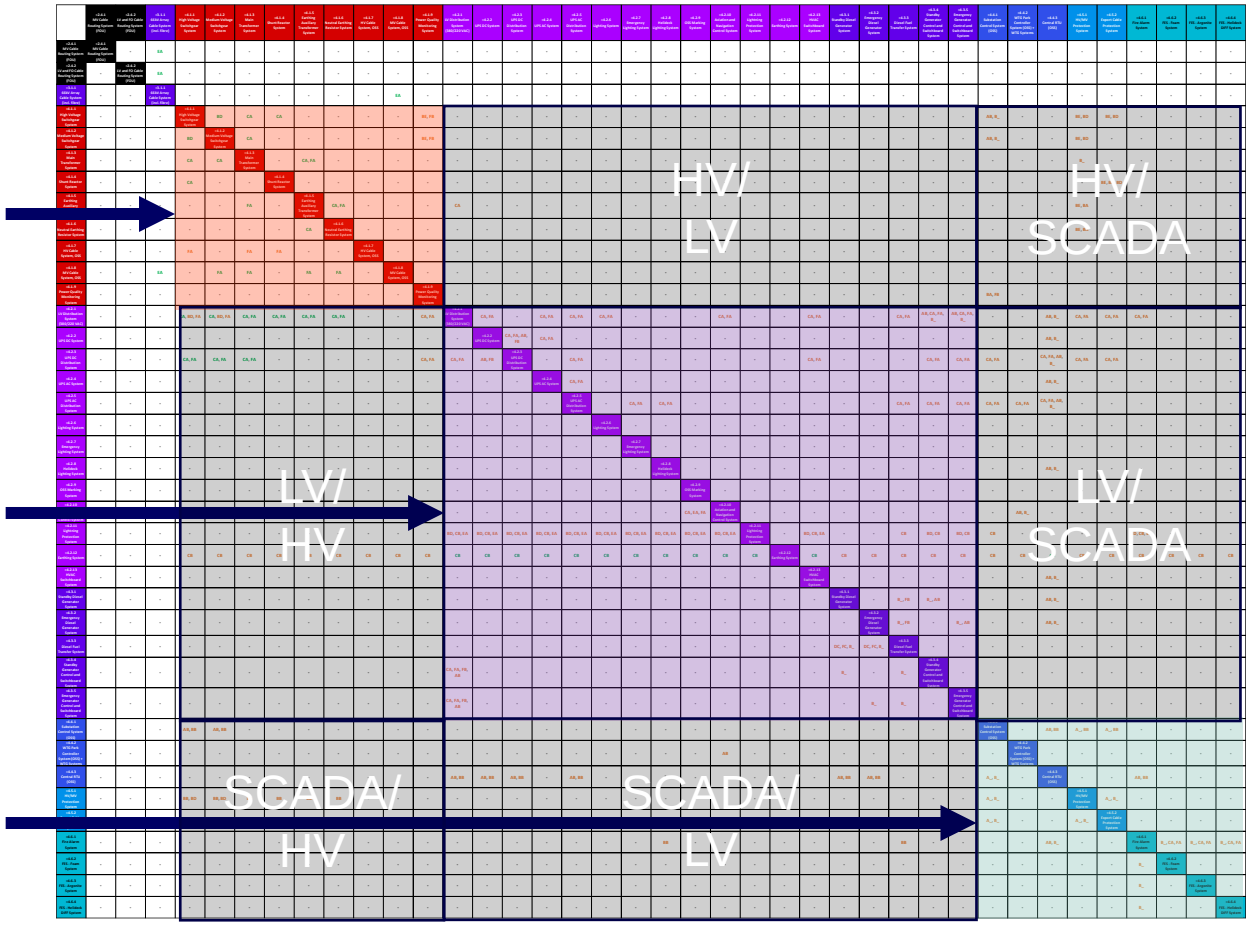
SYSTEMS INTERRELATION

Systematic check of each possible interface

High voltage technical systems
Internal interfaces

Low voltage technical systems
Internal interfaces

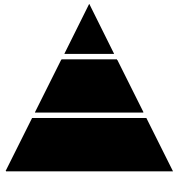
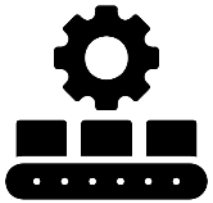
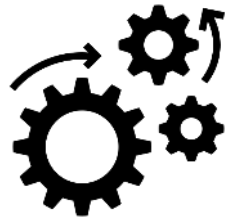
Scada technical systems
Internal interfaces



To make error free projects!

PARTS OF 81346

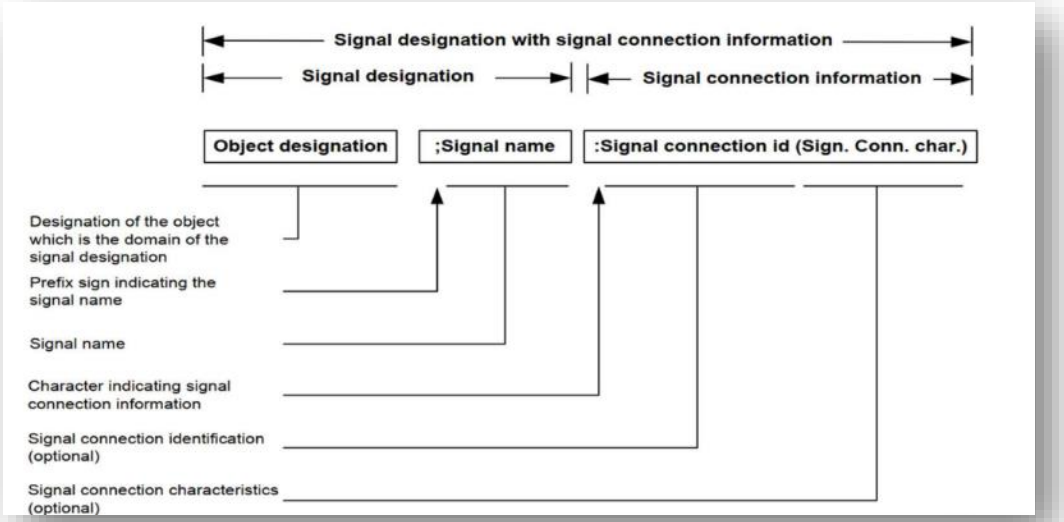
PARTS OF ISO/IEC 81346

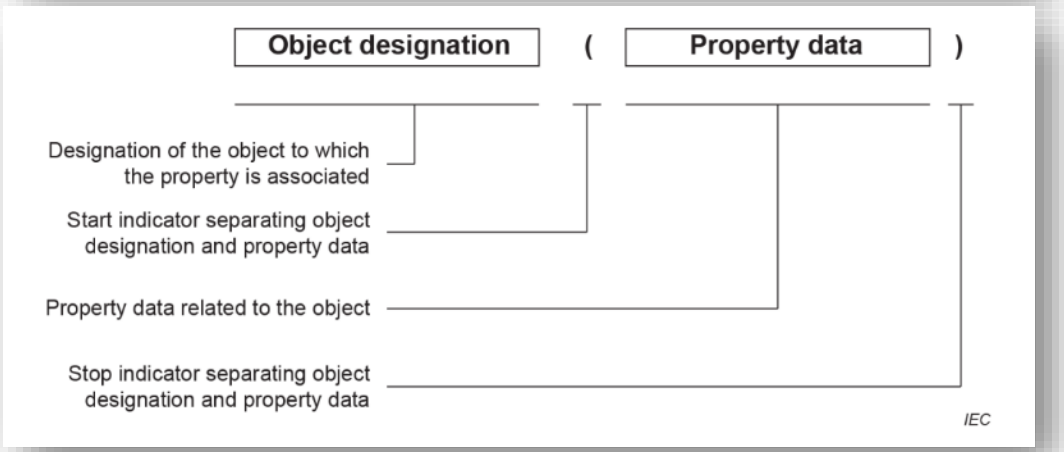
General classification	Power systems	Construction works	Manufacturing	Vehicles	Processes
					
Part ***2***	*Part* ***10***	*Part* ***12***	*Part* ***14***	*Part* ***20***	*Part* ***50***
Revision ready mid 2025			*Primo 2026*	*Just started*	*Ultimo 2026*

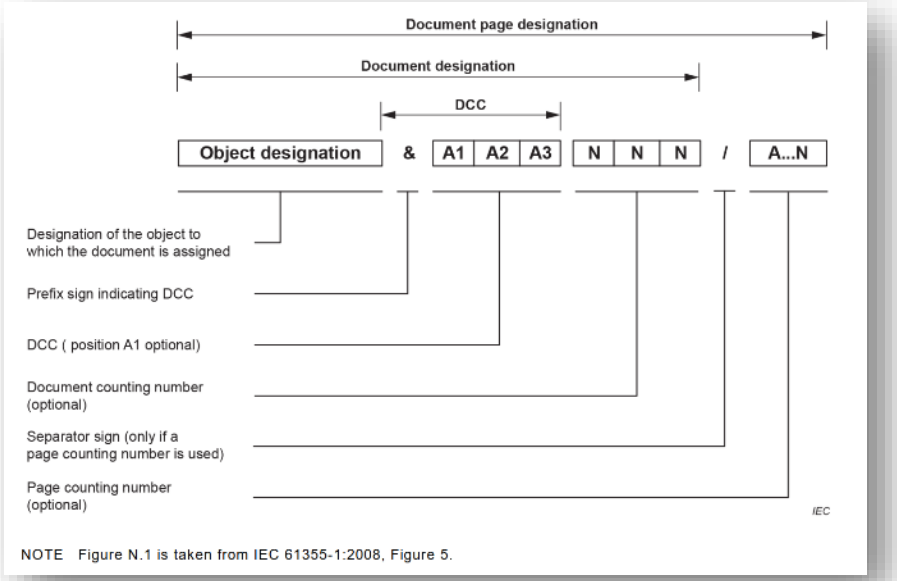
81346-8 (Properties)

81346-1 (General rules)

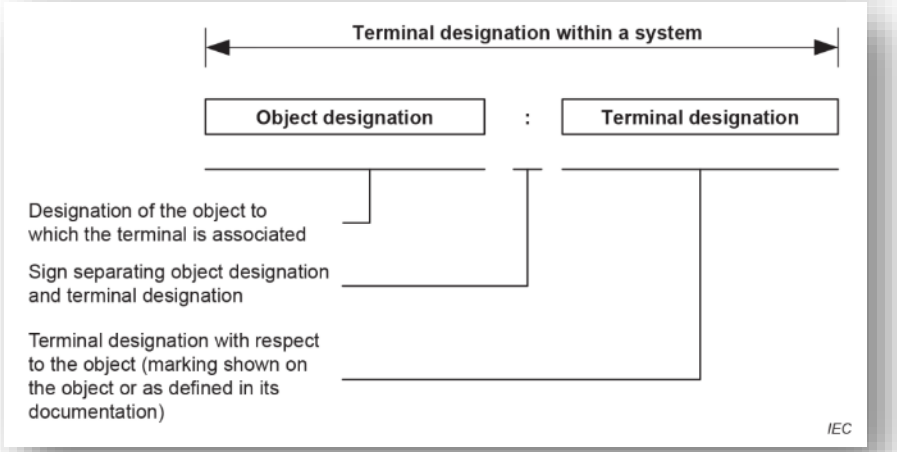
USING ISO/IEC 81346 TO MAKE UNAMBIGUOUS REFERENCES





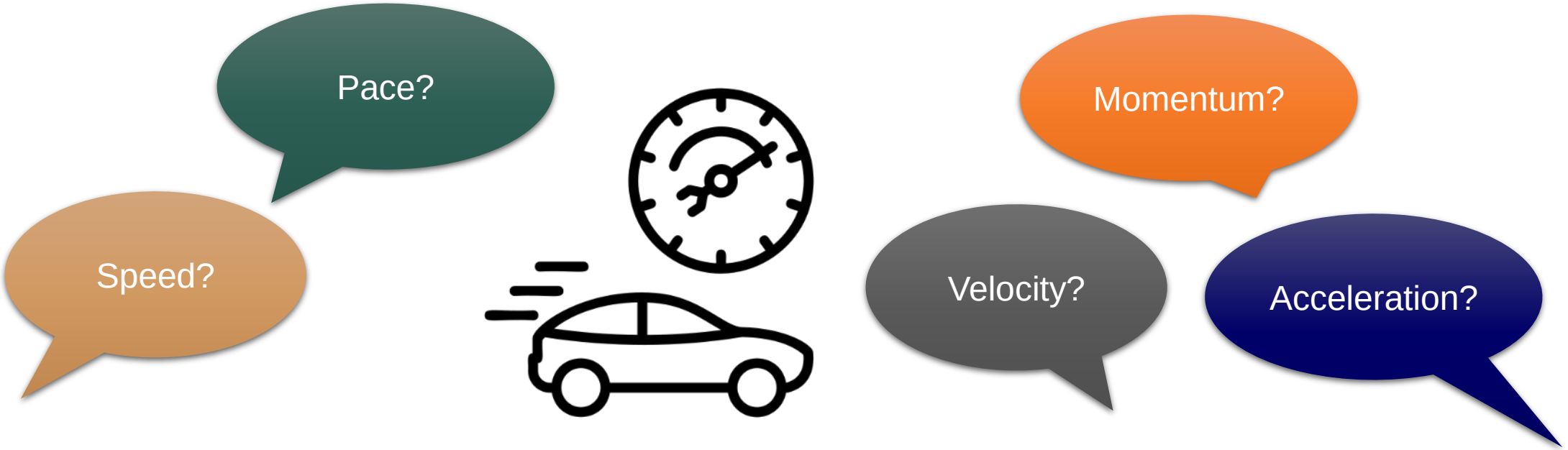


NOTE Figure N.1 is taken from IEC 61355-1:2008, Figure 5.



WHY WE REFERENCE FOR PROPERTIES

- Common references – a common language – is key in modern projects
- Not just for practical tagging but just as much in IT systems



NEW: RDS PROPERTIES

IEC/ISO 81346-8

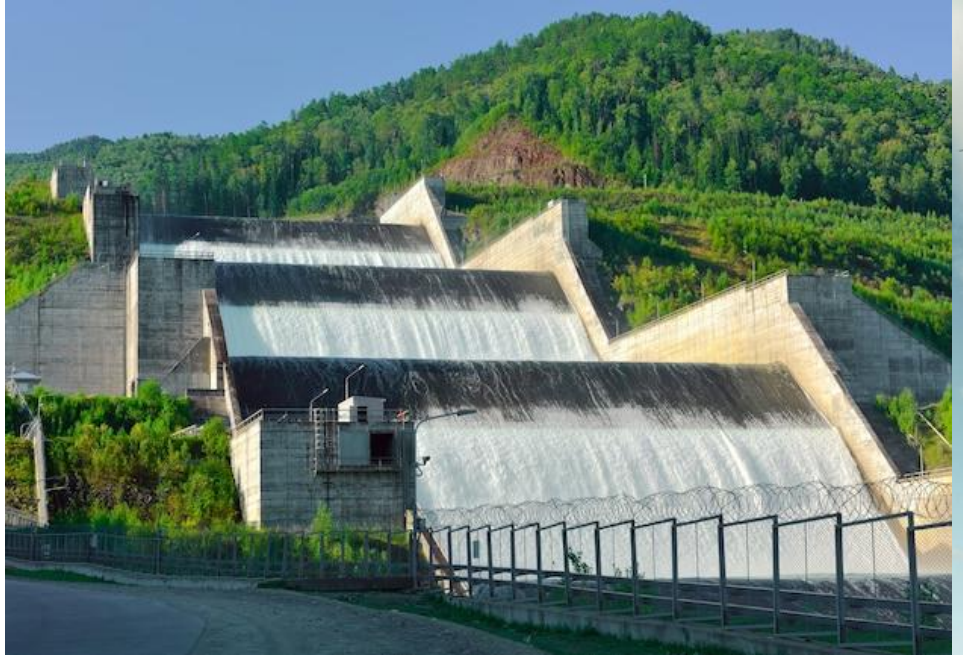
A weight is a weight!

1

… which can be associated with many elements!

Class **ABAWAB** definition

force acting on a body in the gravitational field



RDS FOR POWER SUPPLY SYSTEMS 81346-10

Power systems

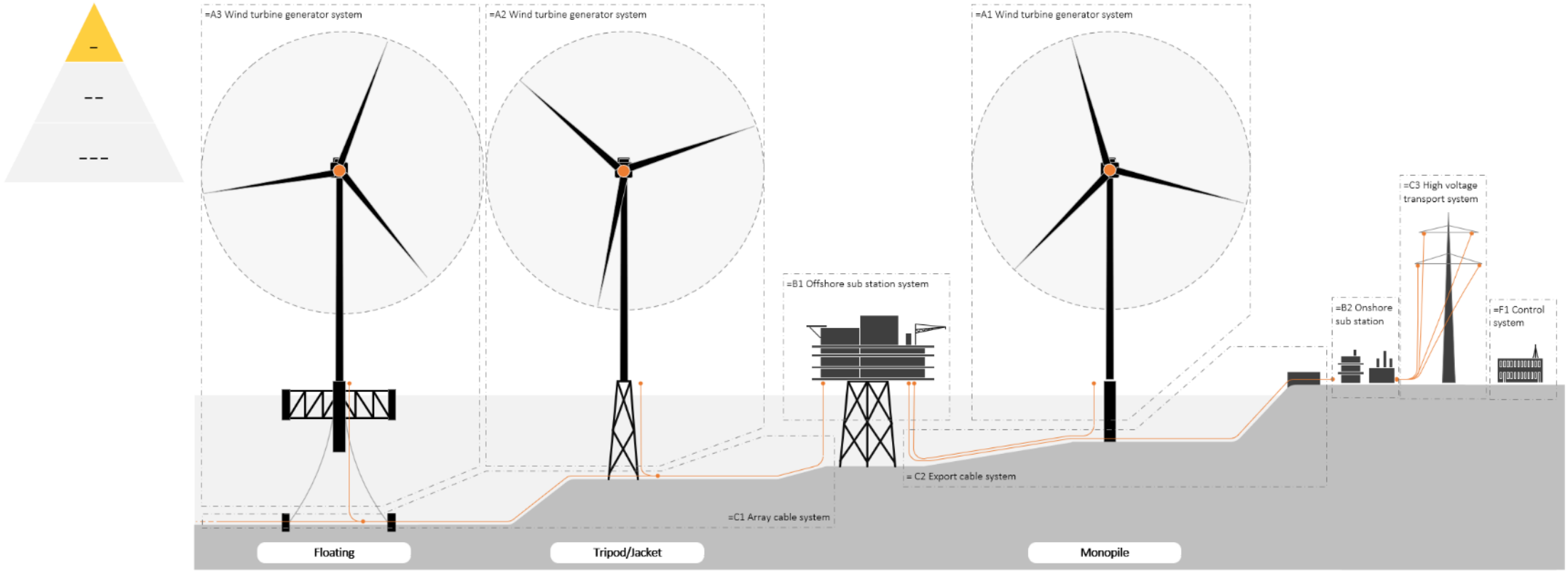
Part ***10***

THE NEW RDS 81346-10

Reference Designation System for Power Systems

RDS 81346 Wind Farm

Functional Systems in a wind farm

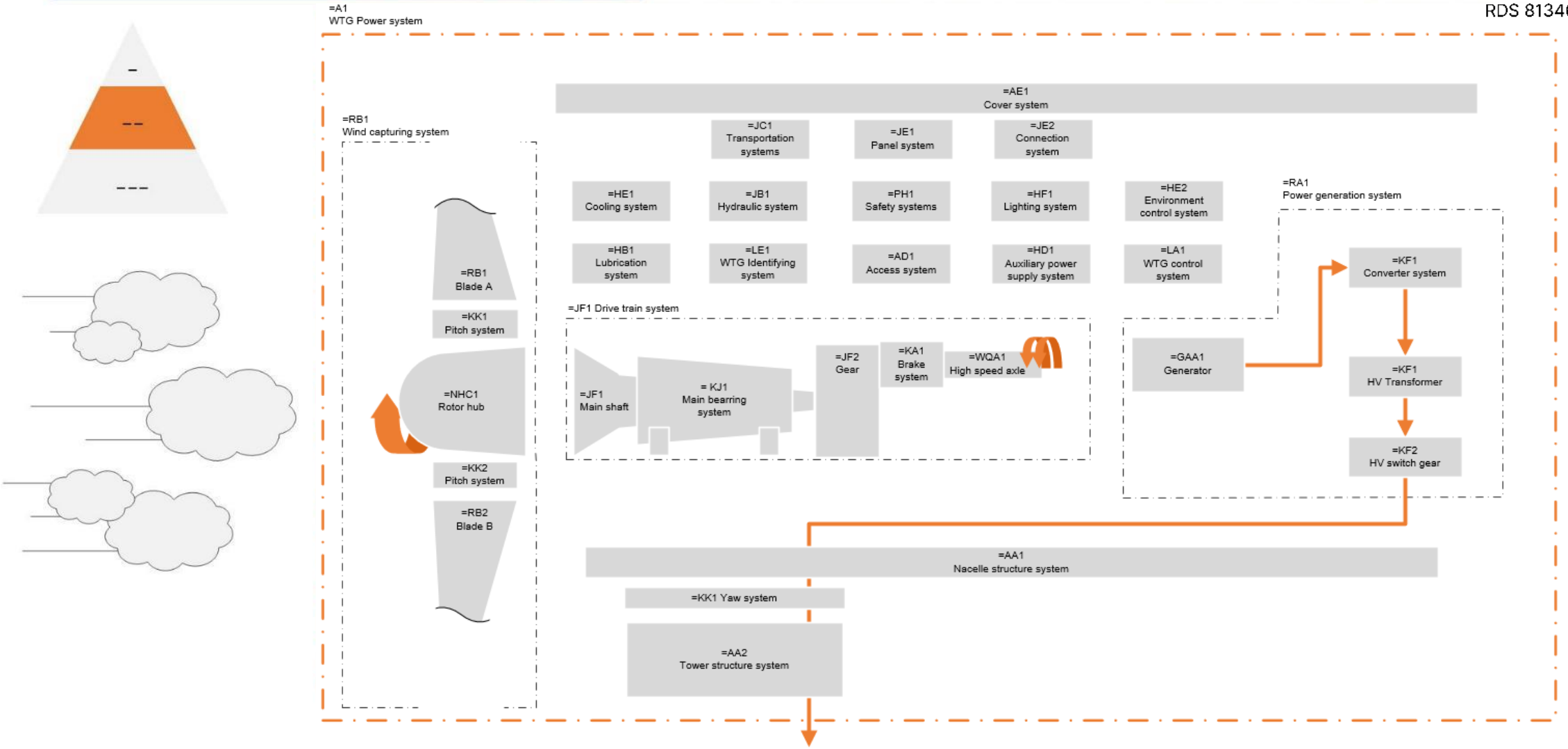


THE NEW RDS 81346-10

Reference Designation System for Power Systems

RDS 81346 Wind Farm

Technical Systems in a WTG





RDS FOR CONSTRUCTION WORKS 81346-12

Construction works

Part
12

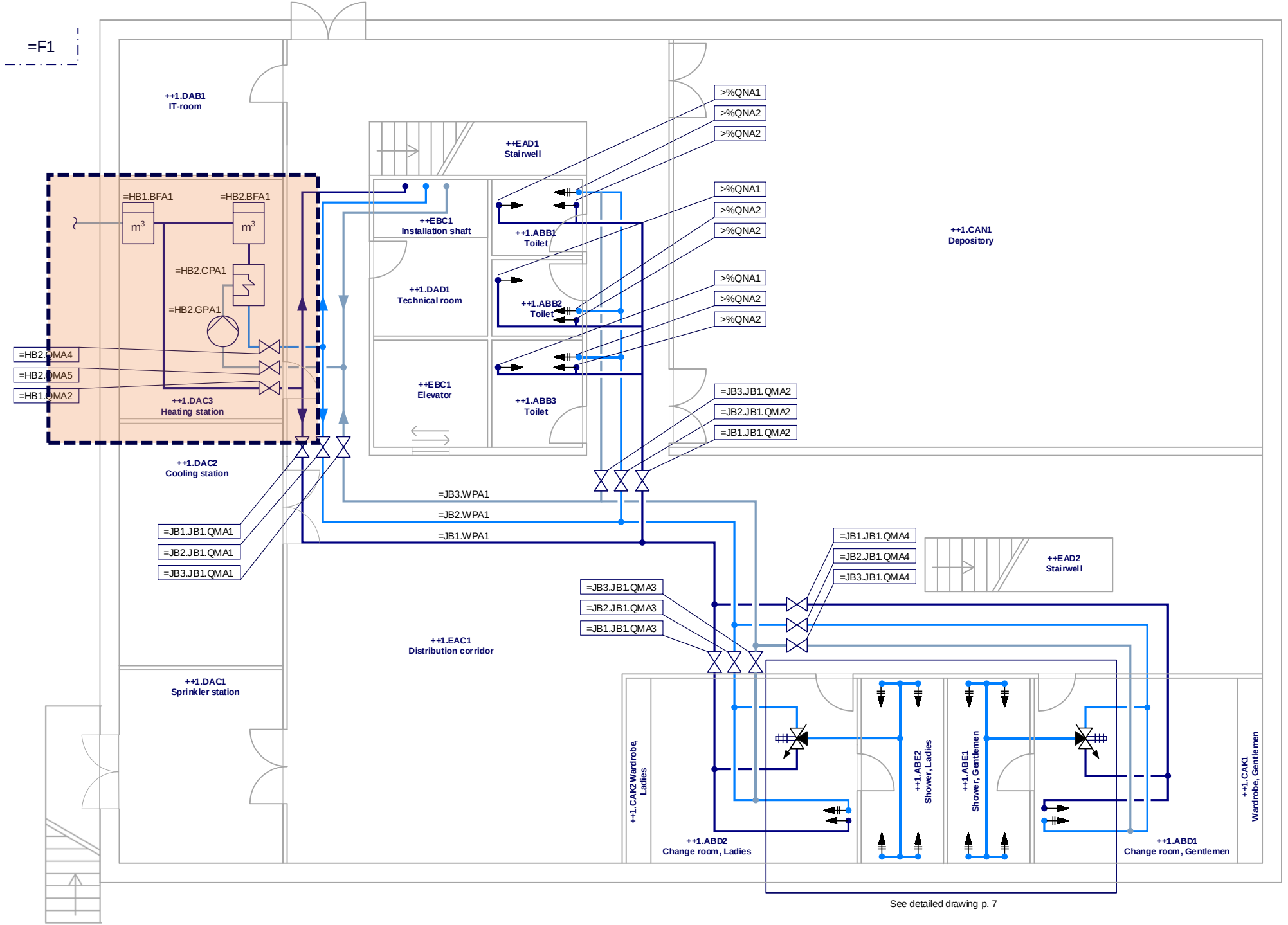
Construction works

Part 12

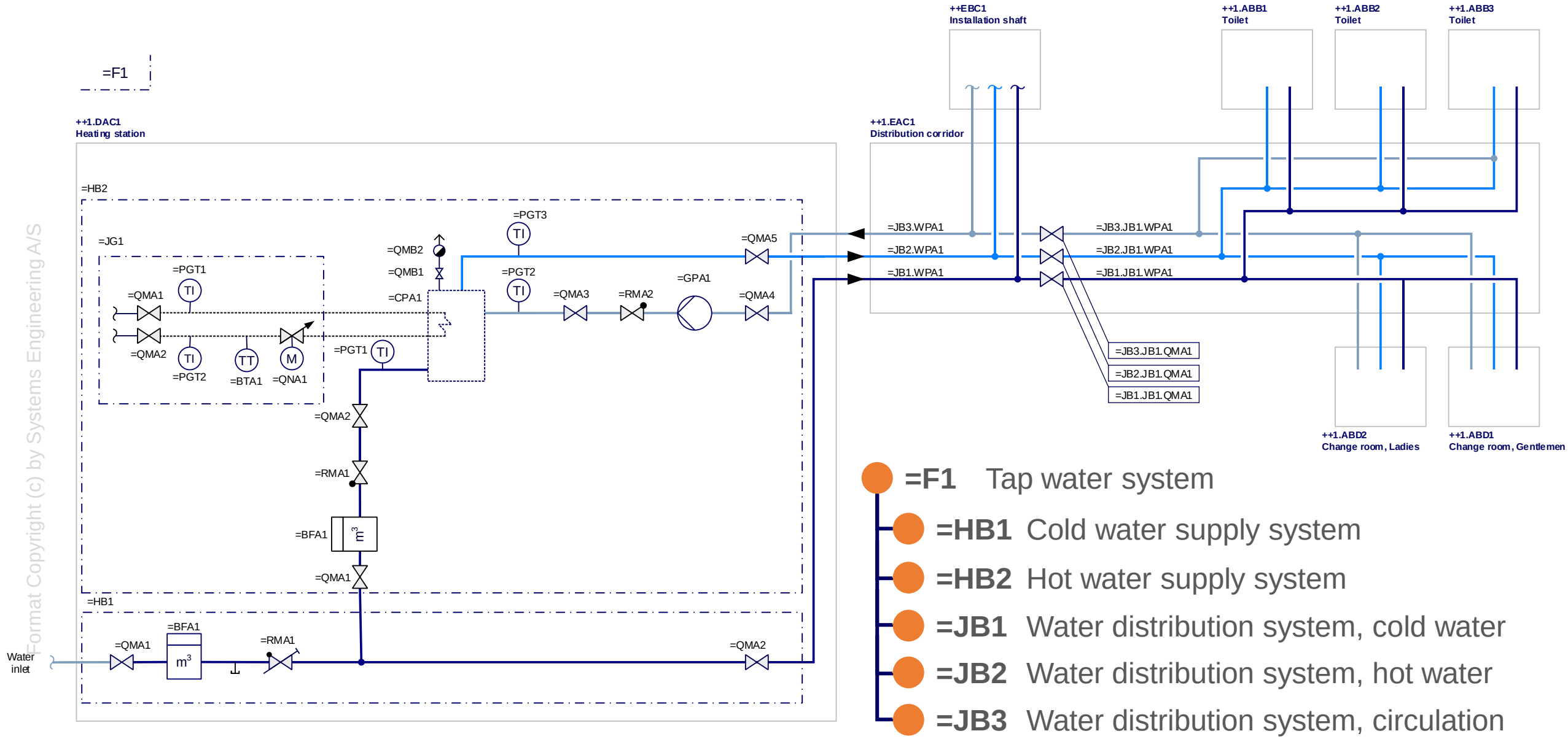
Construction works

Part 12

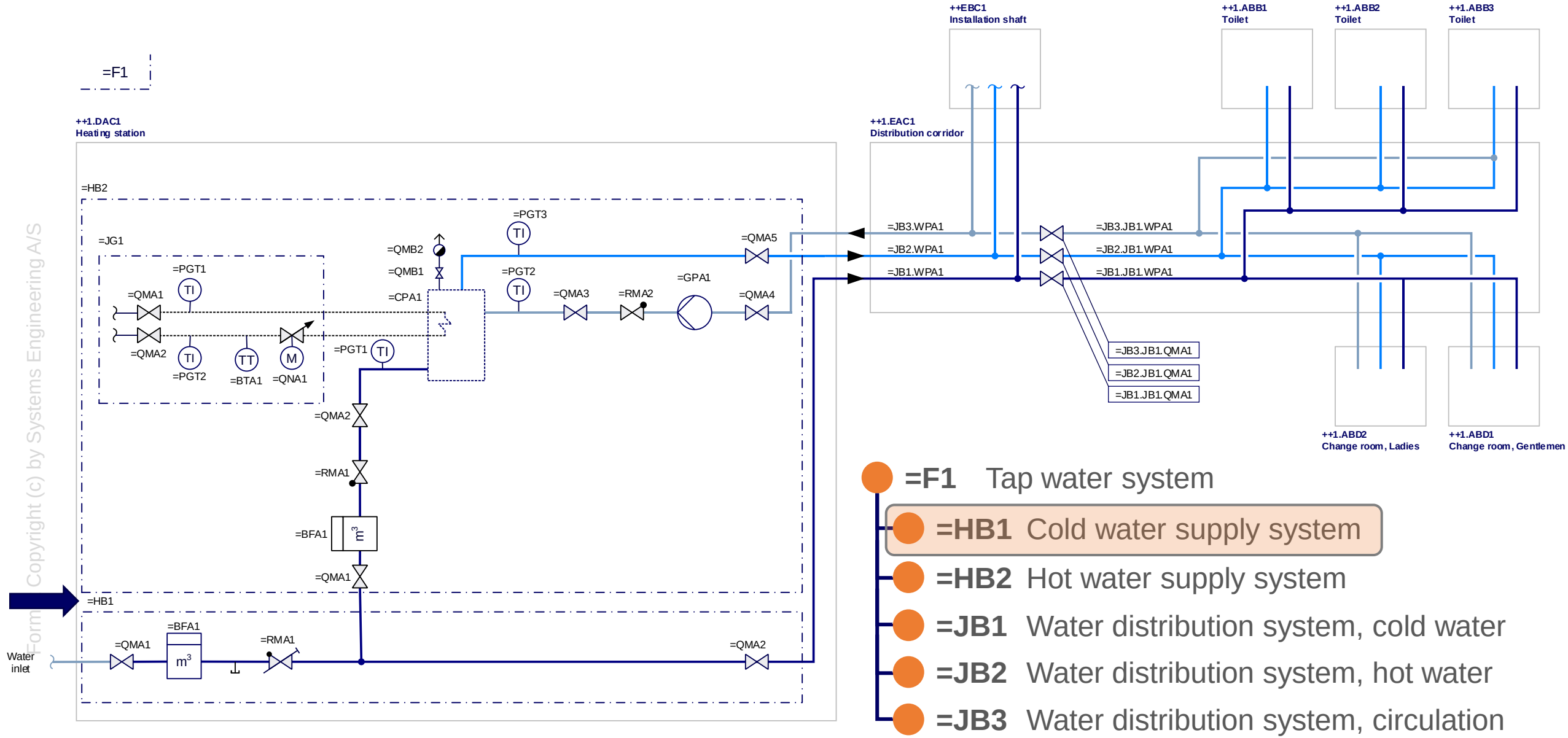
=F1



See detailed drawing p. 7



- **=F1** Tap water system
  - **=HB1** Cold water supply system
  - **=HB2** Hot water supply system
  - **=JB1** Water distribution system, cold water
  - **=JB2** Water distribution system, hot water
  - **=JB3** Water distribution system, circulation



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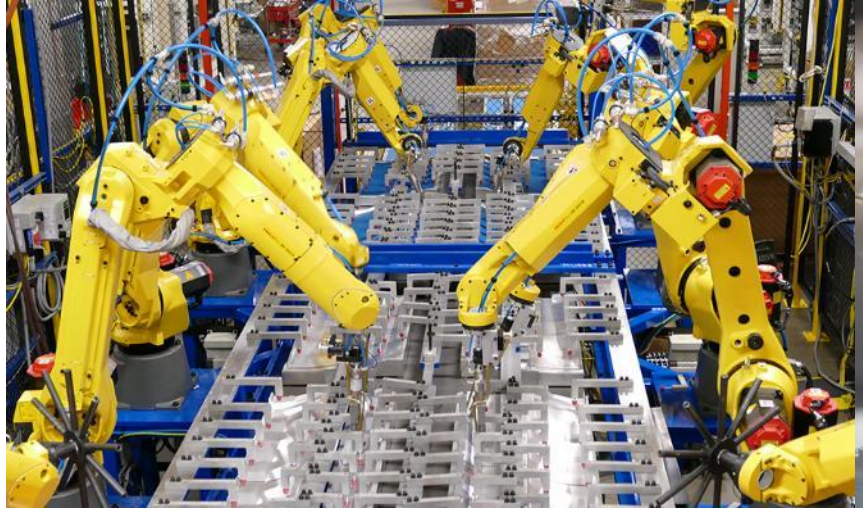
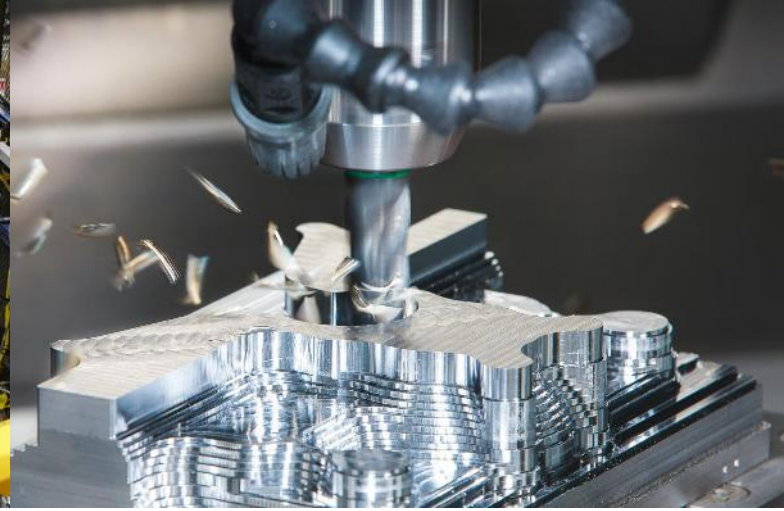




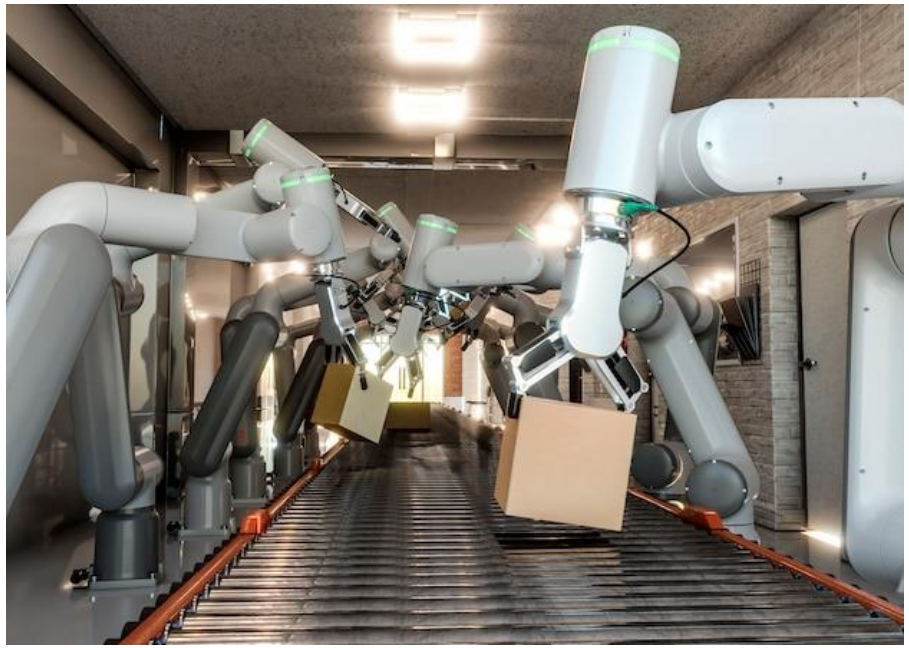
RDS FOR MANUFACTURING SYSTEMS 81346-14

Manufacturing

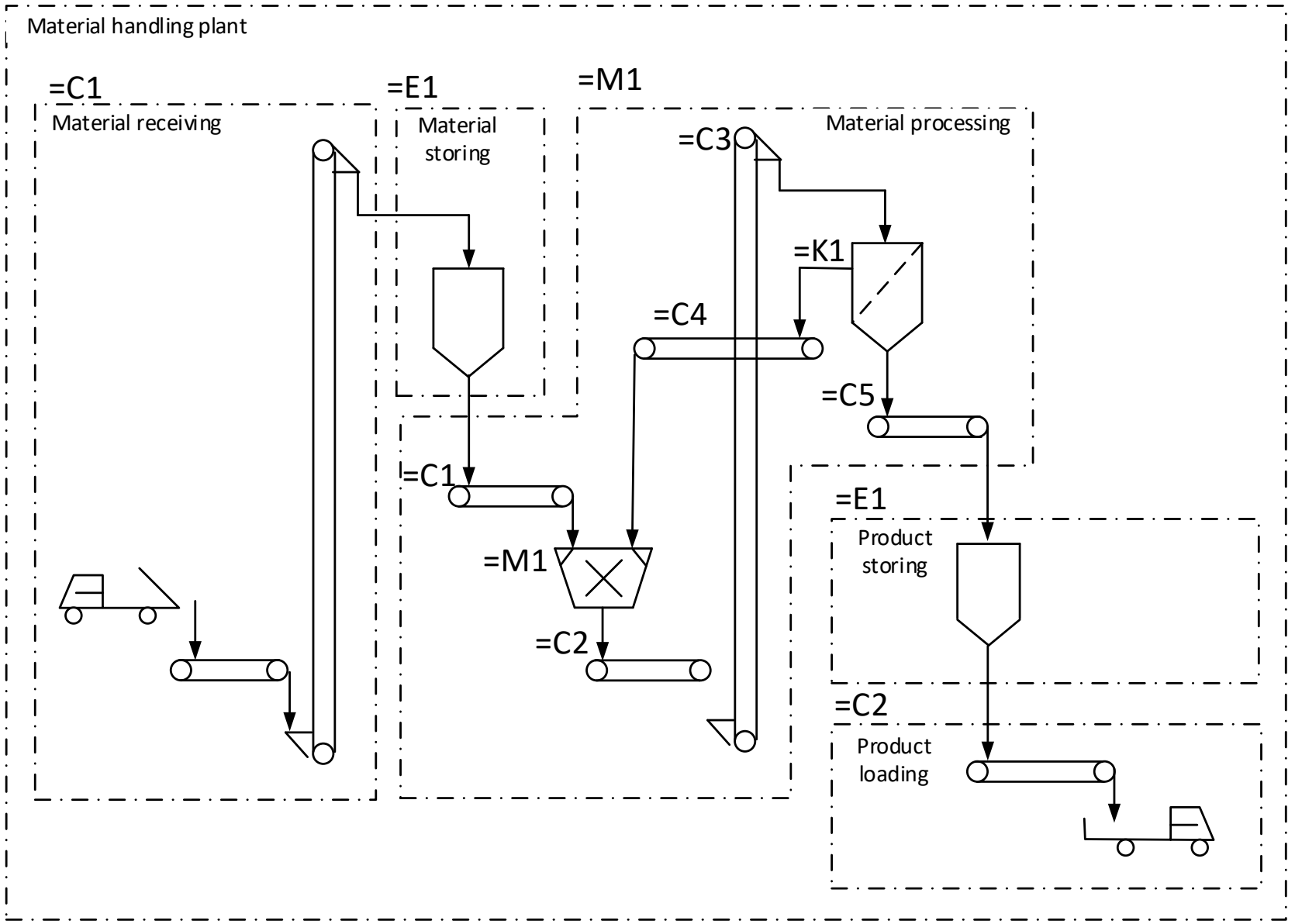
Part
14

INDUSTRIES TO COVER

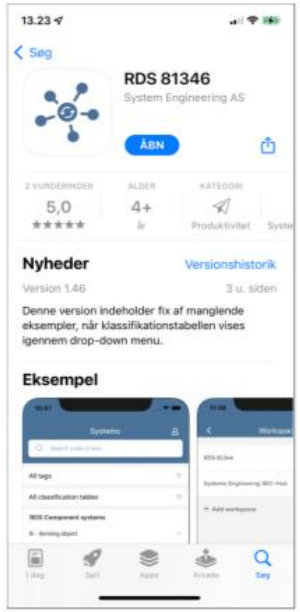
- Food processing
- Assembly plants
- Production plants
- Mining
- Casting and metalwork
- Packaging
- Testing



MANUFACTURING EXAMPLES

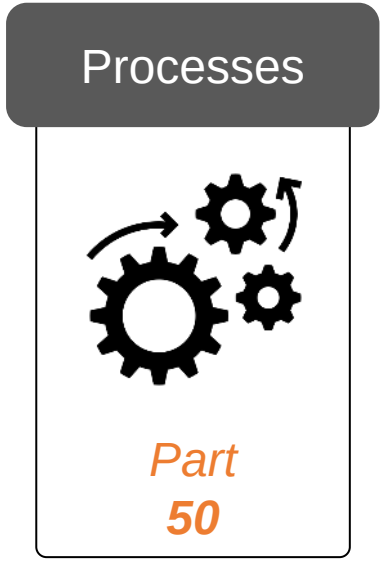


CDV out now(Feb 2025)
Expected approved primo 2026



Find the app in your App store

RDS FOR PROCESSES 81346-50



STRUCTURING PROCESSES

Applying methods from RDS to organize processes

- Road Construction process
  - Ripping process
  - Injecting slurry process
  - Mixing process
  - Compacting process
  - Flat rolling process
  - Density testing process
  - Asphalt paving process
  - Coating process
  - Paint lane stripes process

Flat rolling process

Compacting process

STRUCTURING PROCESSES

Applying methods from RDS to organize processes

- $A1 Road Construction process
  - $BC1 Ripping process
    - $CA1 Preparation process
    - $CA2 Surface treatment process
    - $BC1 Ripping process
  - Injecting slurry process
  - Mixing process
  - Compacting process
  - Flat rolling process
  - Density testing process
  - Asphalt paving process
  - Coating process

$A1.BC1.CA1 Preparation process

$A1.BC1. BC1 Ripping process

CD out now (Feb 2025)
Expected approved ultimo 2026

QUESTIONS

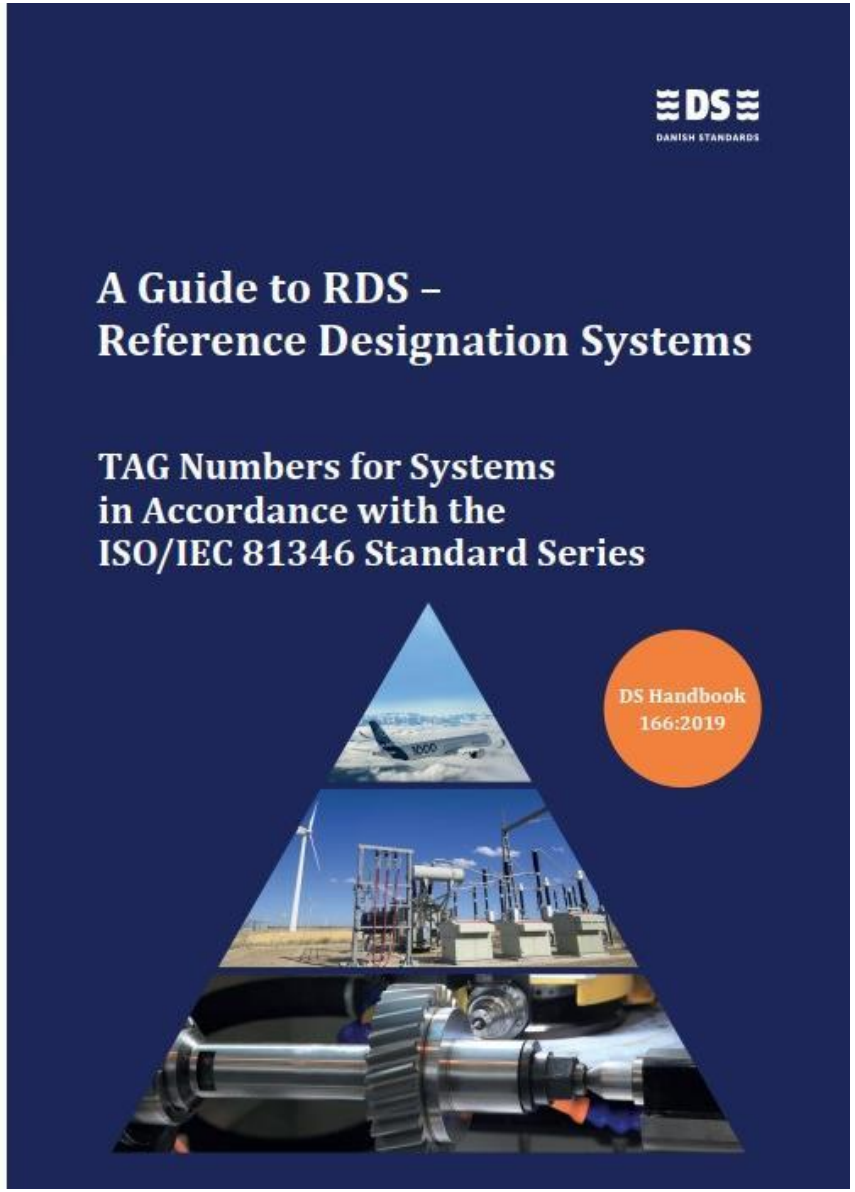
THE 81346 HANDBOOK

Complements the 81346 series

A guide on how to establish system awareness and subsequently prepare reference designations, structuring, and modularization.

Free downloads and newsletter!

Please visit **www.81346.com**



FOR MORE INFORMATION

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“It’s all about creating a common language”