RDS WORKSHOP
DAY 2

10.12.2024

Statkraft

- Fire exits
- Meeting points

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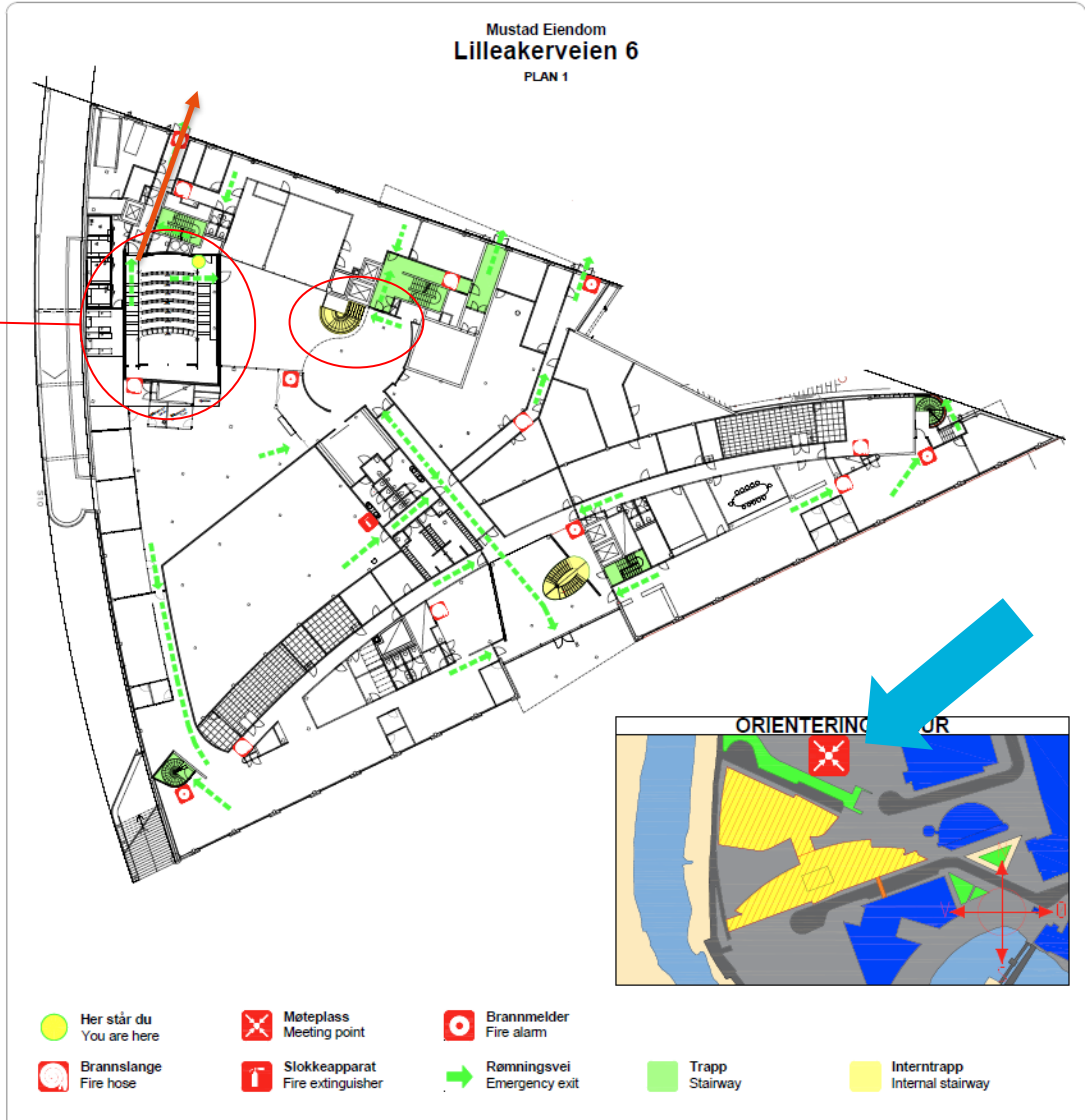
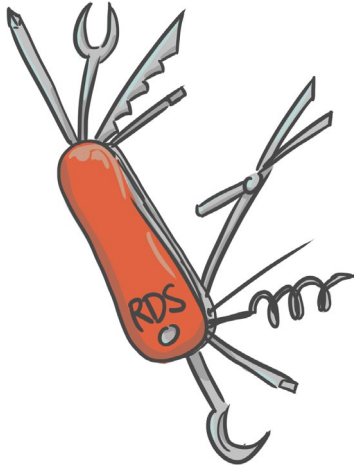
RØMNINGSPLAN / EVACUATIONPLAN

You are here



Agenda

- 101
- Cases
- Lunch
- More cases



81346-101

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Repetition

Figure 5-1— Illustration of the receiver ownership principle

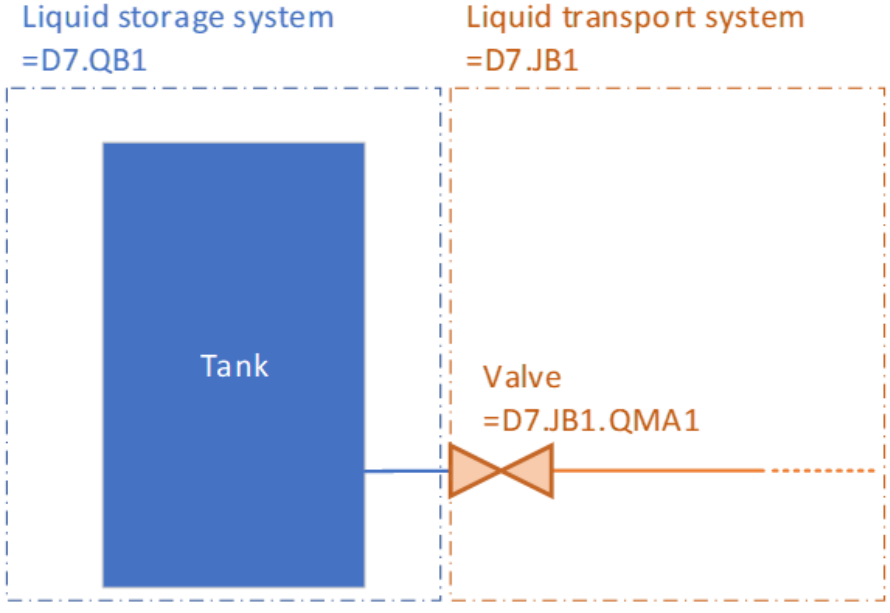
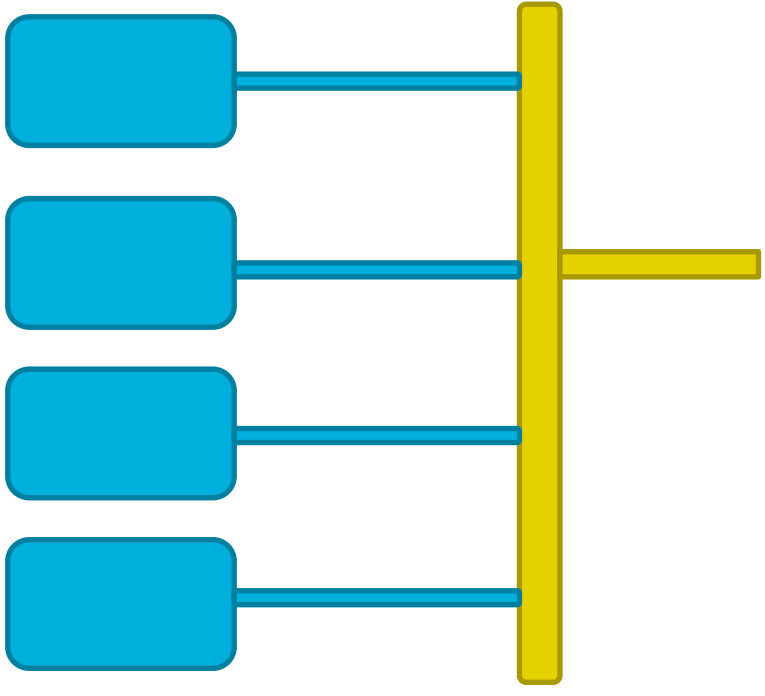


Figure 5-2— Example of the receiver ownership principle

The exception:
The collecting system principle

- Busbars
- Waterways



QPS

A tool used for digging

FHG

A tool used for saving princesses

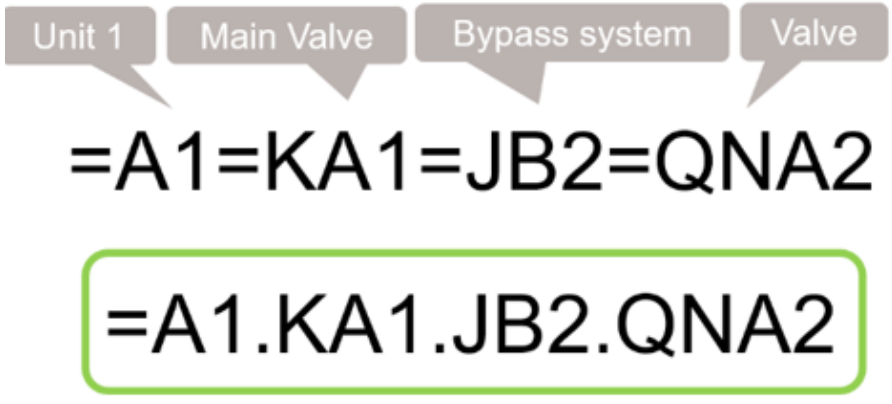
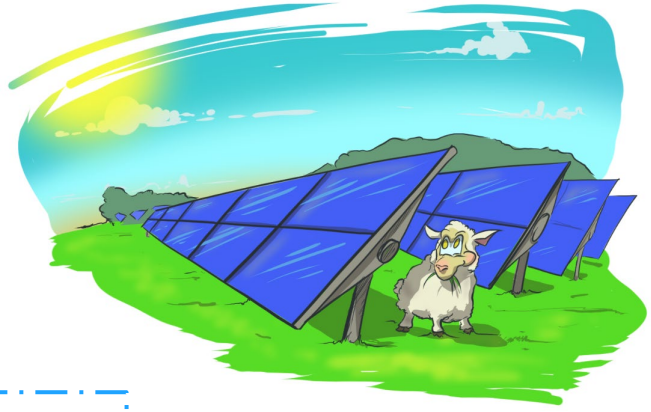


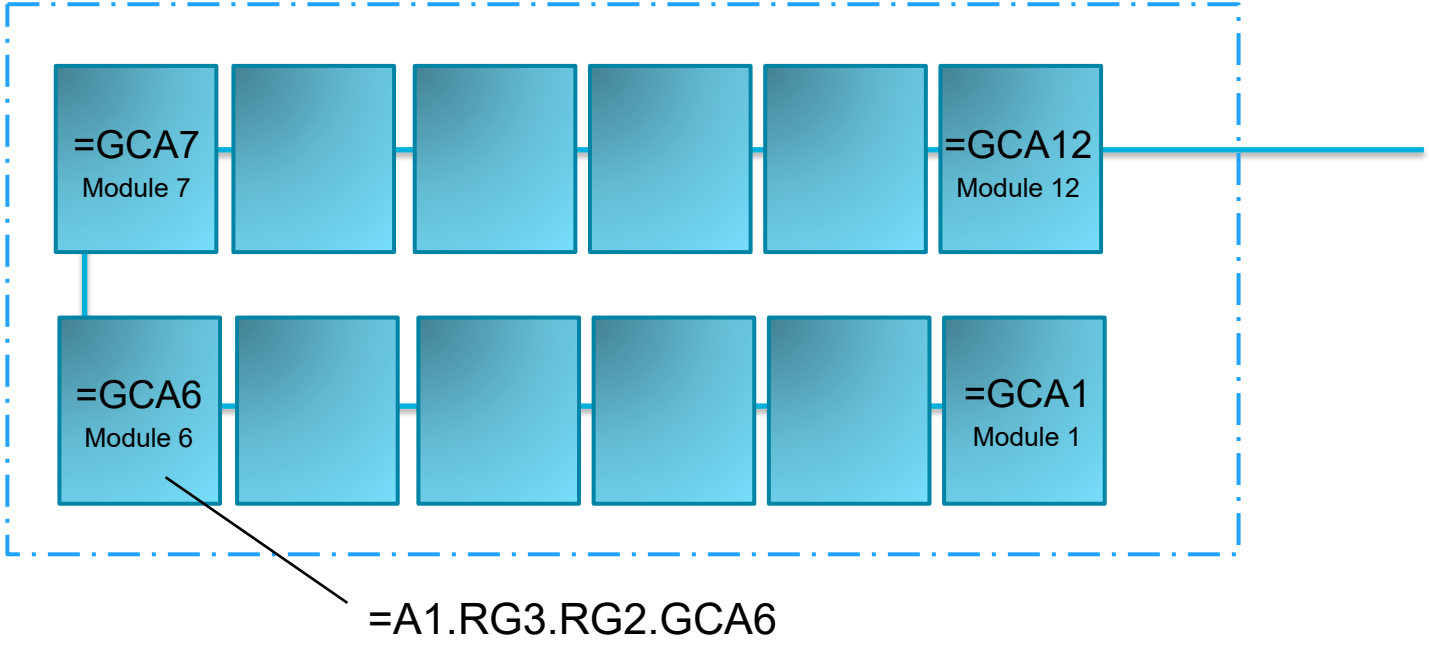
Figure 5-5 - Preferred syntax

|Association|



=A1.RG3.RG2

PV block 1, Generator 3 (“inverter system)”, String 2



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“Tracker”

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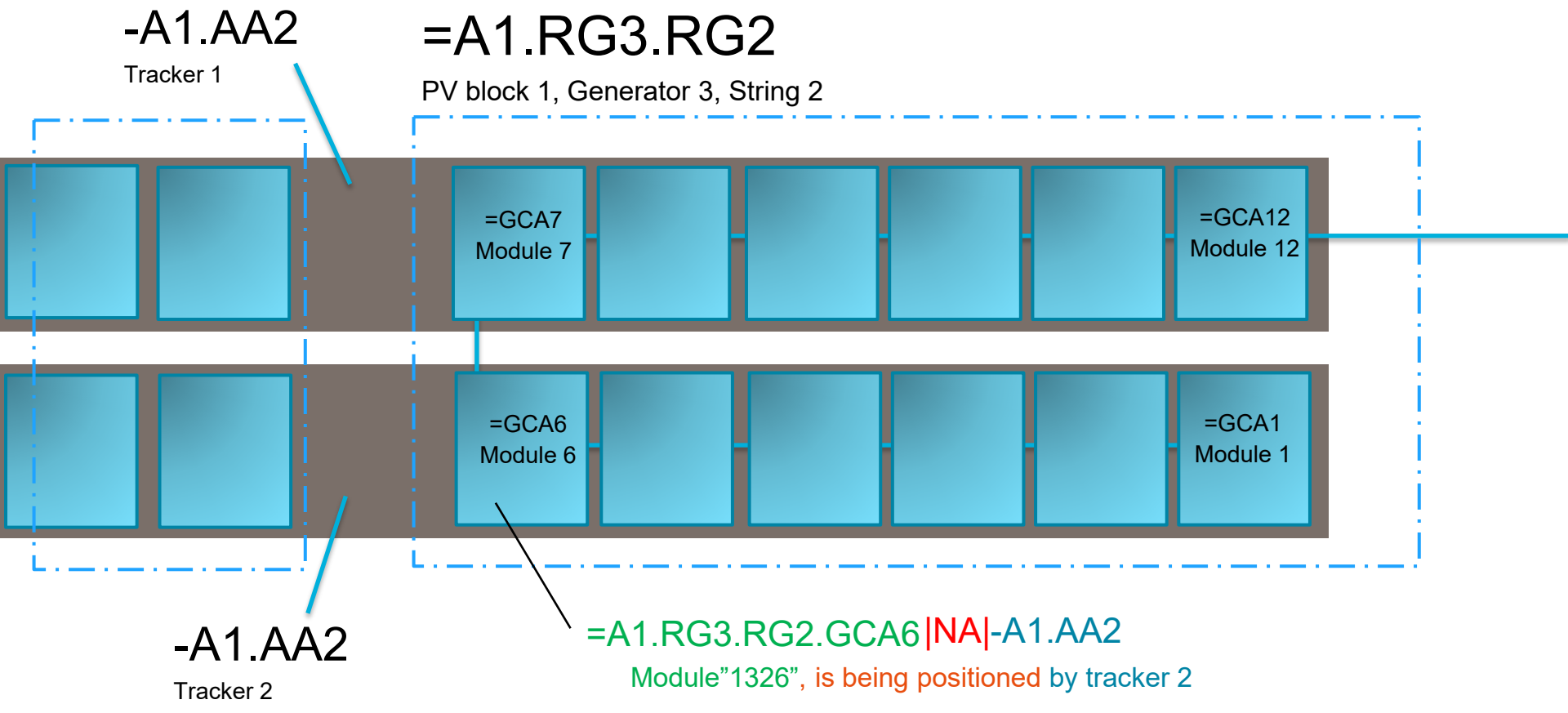
-A1.AA2
Tracker 1
=A1.RG3.RG2
PV block 1, Generator 3, String 2
=GCA7
Module 7
=GCA12
Module 12
=GCA6
Module 6
=GCA1
Module 1
-A1.AA2
Tracker 2
=A1.RG3.RG2.GCA6|NA|-A1.AA2
Module"1326", is being positioned by tracker 2

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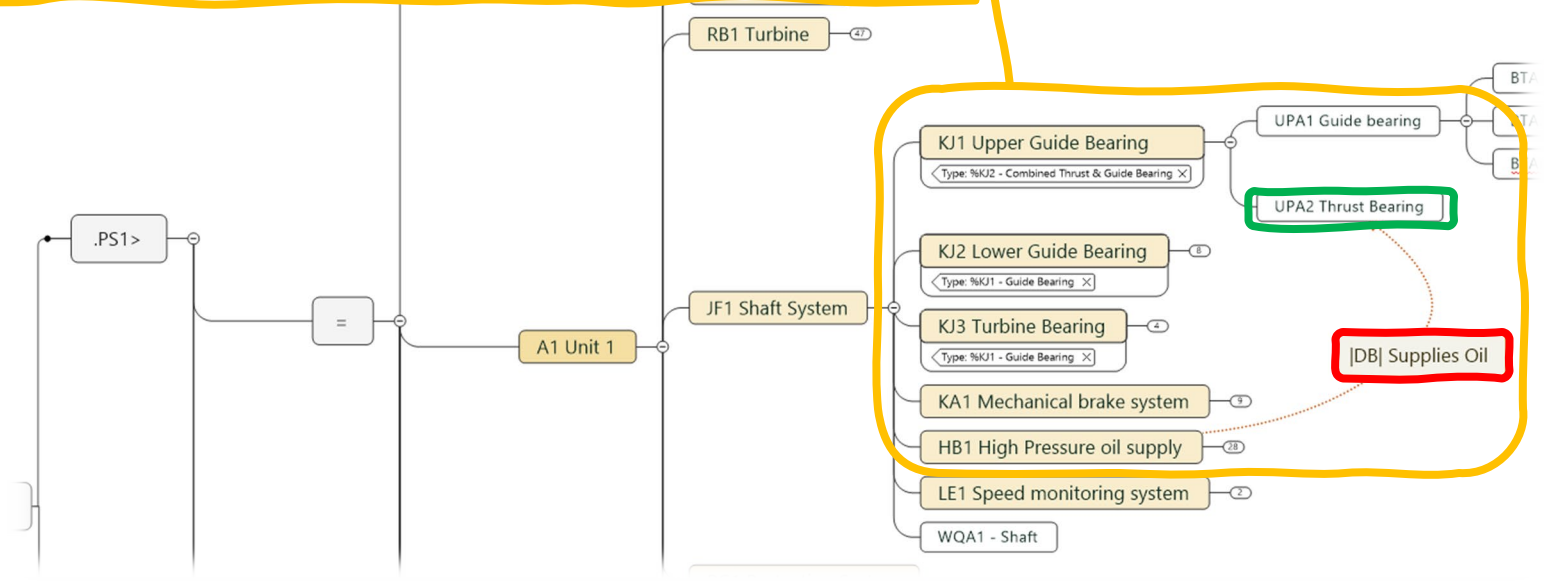
	Class	Sub-class	Class name	Definition	Note/Example
2	**A**		**Transfer of software**	**point where two systems affect each other for data exchange by means of software**	
3		**AA**	Data transfer	point where two systems affect each other for data exchange by means of software in the form of complex data	Protocols, Device drivers, registers are supplied/exchanged
4	**B**		**transfer of signal**	**point where two systems affect each other for signal supply**	
5		**BA**	Alarm signal transfer	point where two systems affect each other for signal supply in the form of alarm object	Alarm signal is exchanged E.g. "Motor temperature high"
6		**BB**	Command signal transfer	point where two systems affect each other for signal supply in the form of command object	Command signal is exchanged E.g. "Start motor", ref IEC 61175 def
7		**BC**	Event signal transfer	point where two systems affect each other for signal supply in the form of event object	Event signal is exchanged E.g. "Motor started"
8		**BD**	Indication signal transfer	point where two systems affect each other for signal supply in the form of indication object	Indication signal is exchanged E.g. power on/off or breaker open/closed
9		**BE**	Power signal	point where two systems affect each other for signal supply in the form of power signal	
10		**BF**	Measuring signal transfer	point where two systems affect each other for signal supply in the form of measuring object	Measurement is sent to another system E.g. measured motor speed value
11		**BG**	Set value signal transfer	point where two systems affect each other for signal supply in the form of set value object	A set value is sent to another system E.g. set motor speed
12	**C**		**transfer of energy**	**point where two systems affect each other for energy supply**	
17	**D**		**transfer of material**	**point where two systems affect each other for material movement**	
22	**E**		**structural support**	**point where two systems affect each other for structural support**	
25	**F**		**transport and routing infrastructure support**	**point where two systems affect each other for provision of transportation infrastructure**	
30	**G**		**allocation of space**	**point where two systems affect each other for provision of space**	**footprint**
33	**H**		**field and potential interaction**	**point where two systems affect each other for field and potential interaction**	
36	**I**		*(Not to be used)*		
37	**J**		**transfer of ionizing non-radiation**	**point where two systems affect each other for supply of ionizing radiation**	
43	**L**		**transfer of ionizing radiation**	**point where two systems affect each other for supply of ionizing radiation**	
50	**M**		**transfer of acoustic waves**	**point where two systems affect each other for supply of acoustic waves**	
53	**N**		**Mechanical interraction**	**point where a system affect another mechanically**	
54		**NA**	Positioning	point where one system affects the other mechanically, by physically changing the position of the other, relative to an external reference	Setting, governing, positioning
55		**NB**	Guiding	point where one system affects the other mechanically, by physically changing the position of the other, relative to itself	Lifting, pushing, hoisting, lowering draging, pulling
56	**End**				

=A1.JF1.HB1|DB|=A1.JF1.KJ1.UPA1

The unit HP Oil system supplies liquid matter to the unit thrust bearing



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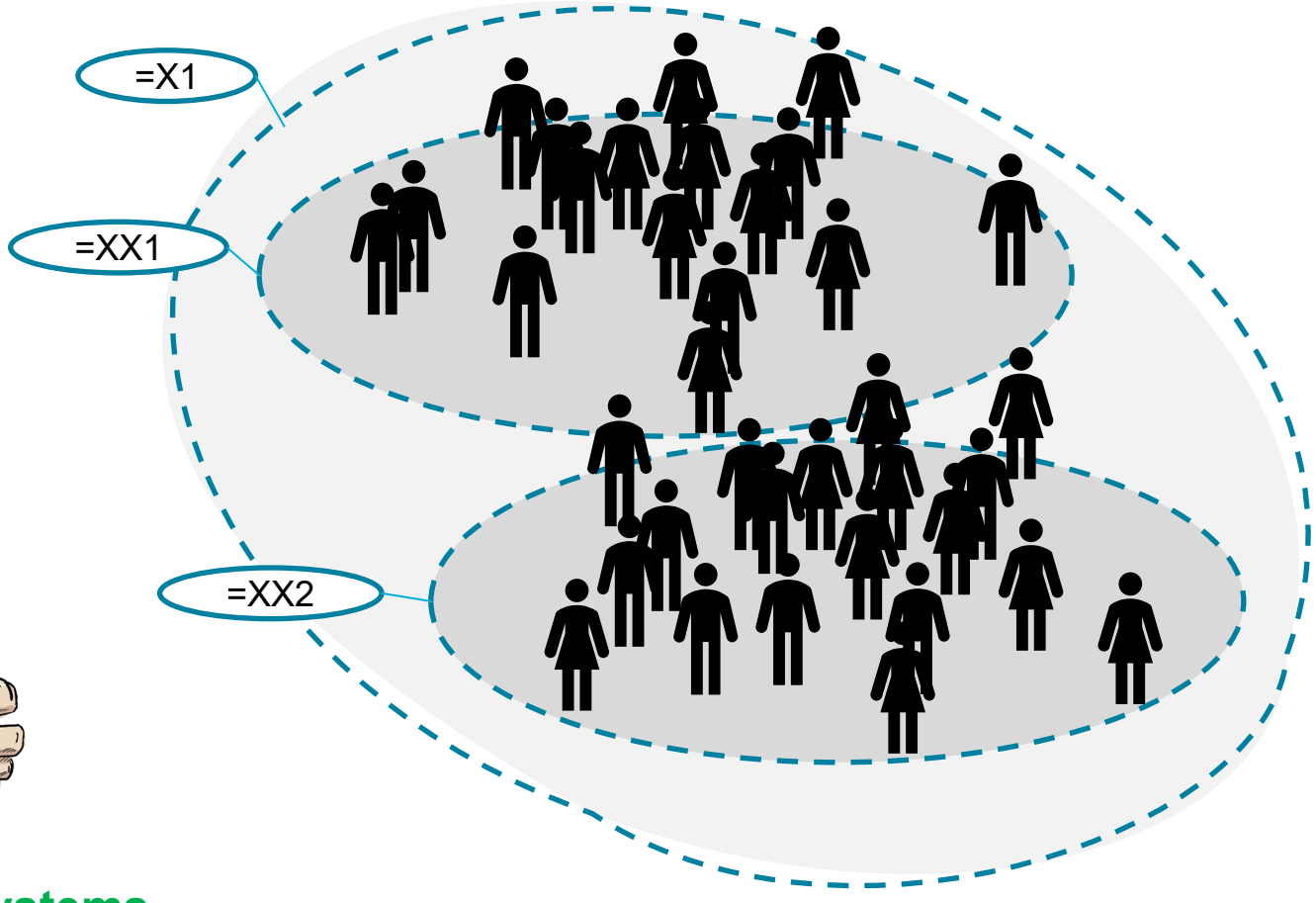
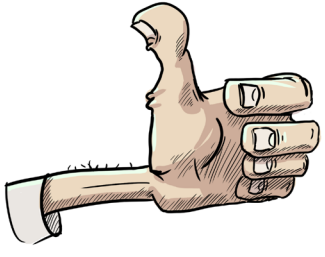
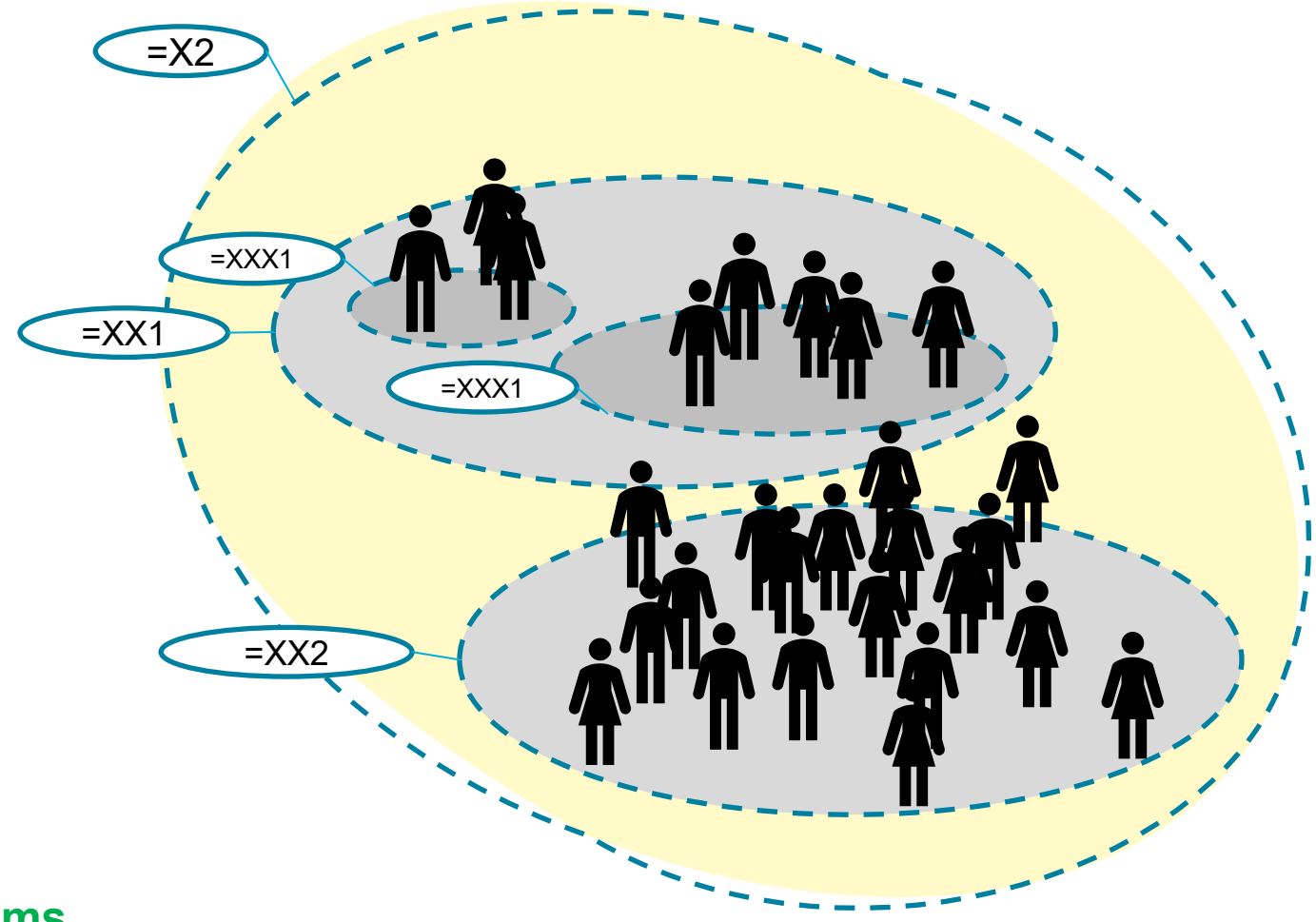
Modelling principles:

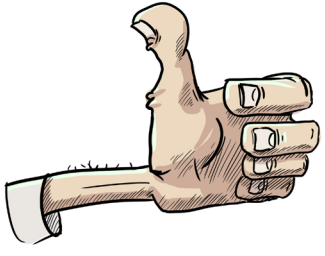
How many levels?





5-25 sibling systems





5-25 sibling systems

“No more complicated than it has to be!”

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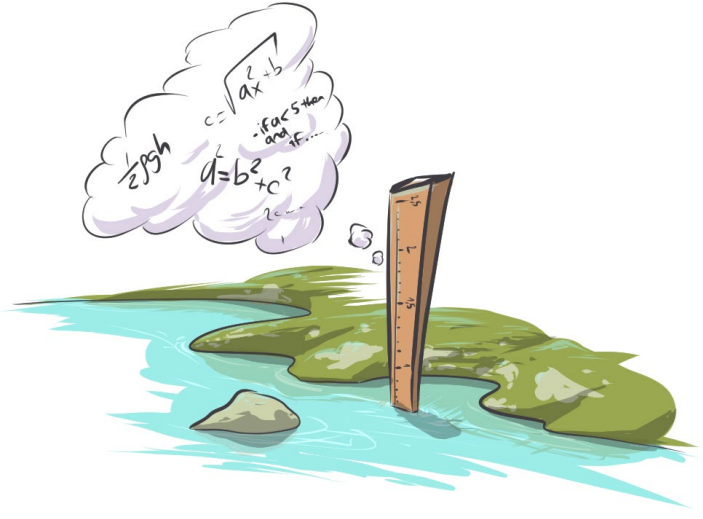
-E1 (Reservoir 1)

-E1.LE1 (Monitoring syst. 1)

-E1.LE1.BLA1 (Level monitoring syst. 1)

-E1.LE1.BLA1.BLA1 (Level sensor 1)

-E1.LE1.BLA1.BLA2 (Level sensor 2)



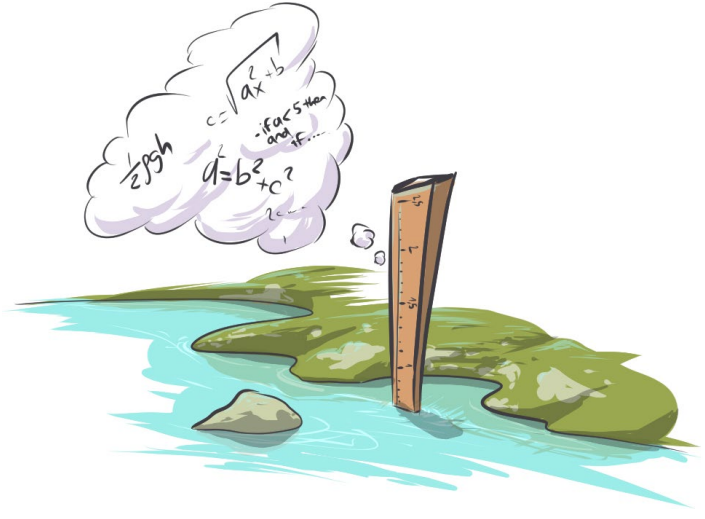
-E1 (Reservoir 1)

Only for level monitoring

-E1 .BLA1 (Level monitoring syst. 1)

-E1 .BLA1.BLA1 (Level sensor 1)

-E1 .BLA1.BLA2 (Level sensor 2)



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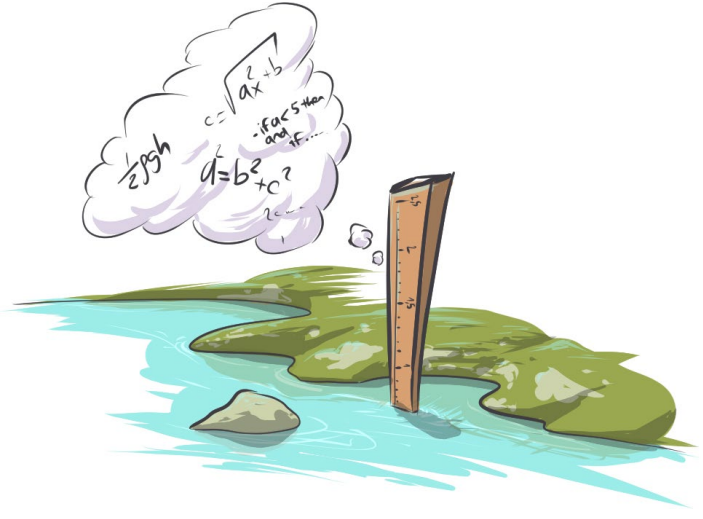
-E1 (Reservoir 1)

-E1.BLA1 (Level monitoring syst. 1)

-E1.BLA1.BLA1 (Level sensor 1)

-E1.BLA1.BLA2 (Level sensor 2)

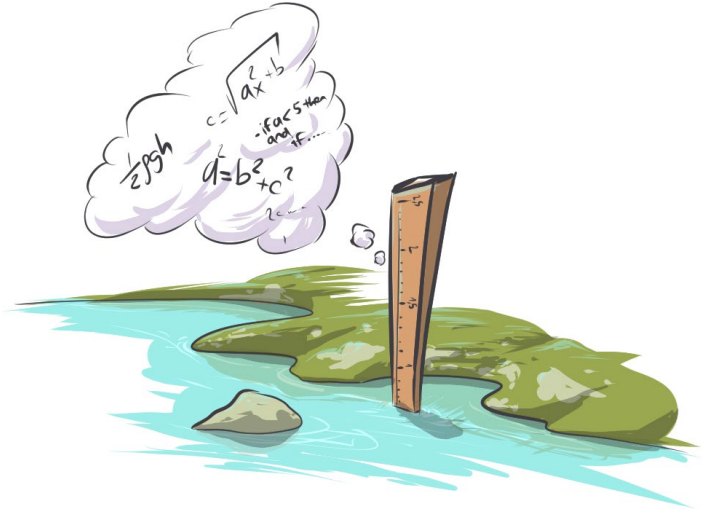


-E1 (Reservoir 1)

-E1.BLA1 (Level monitoring syst. 1)

-E1.BLA1.BPA1 (Pressure sensor 1)

-E1.BLA1.BPA2 (Pressure sensor 2)



Annex D
(Informative)

Classification of Association, suggested classes

Class	Sub-class	Class name	Definition
A		**Transfer of software**	**Relationship where two systems exchange digital information**
	AA	Software transfer	Relationship where two systems exchange software in the form of complex data
B		**Transfer of signal**	**Relationship where two systems exchange signals and/or data**
	BA	Event signal transfer	Relationship where two systems exchange signals and/or data in the form of an event
	BB	Control signal transfer	Relationship where two systems exchange signals and/or data in the form of a control
	BC	Status information signal transfer	Relationship where two systems exchange signals and/or data in the form of indication
	BD	Measuring signal transfer	Relationship where two systems exchange signals and/or data in the form of measurements
	BE	Setting value signal transfer	Relationship where two systems exchange signals and/or data in the form of set values
C		**transfer of energy**	**Relationship where energy flows between two systems**
	CA	Electrical energy transfer	Relationship where energy flows between two systems in electrical form
	CB	Thermal energy transfer	Relationship where energy flows between two systems in the form of thermal energy
	CC	Kinetic energy transfer	Relationship where energy flows between two systems in the form of kinetic energy
D		**transfer of material**	**Relationship where matter flows between two systems**
	DA	Gas material transfer	Relationship where matter flows between two systems in gaseous form

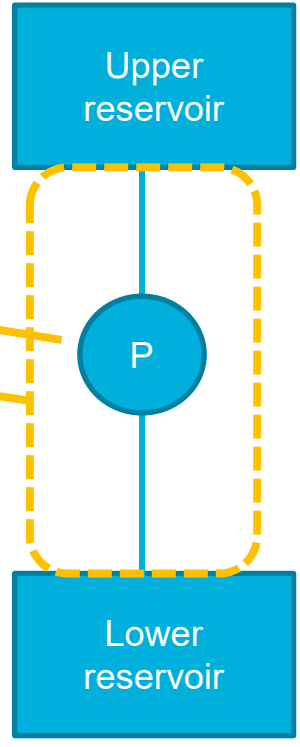
Modelling principles:

This or that?

?

KE – Pump system

JB – Liquid transport system



Pumps are often used for lifting/transport, but that is an assumption. KE increases pressure

A battery system is:

- ❑ Electrical power supply (HD)
- ❑ Electrical energy storage system (QD)

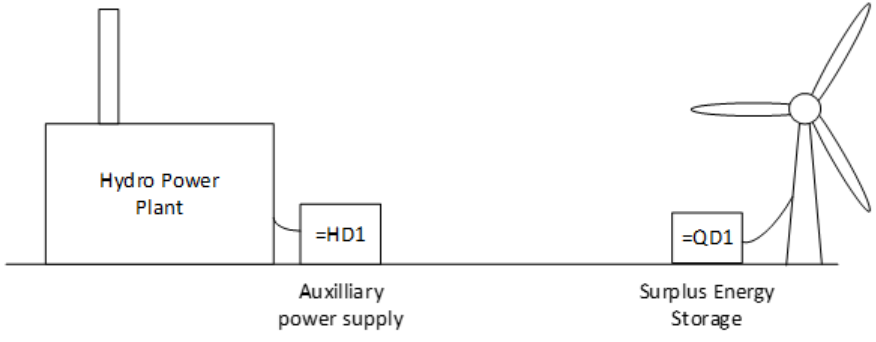


Figure 9-4 HD or QD illustration

10. Classification Guideline - CW

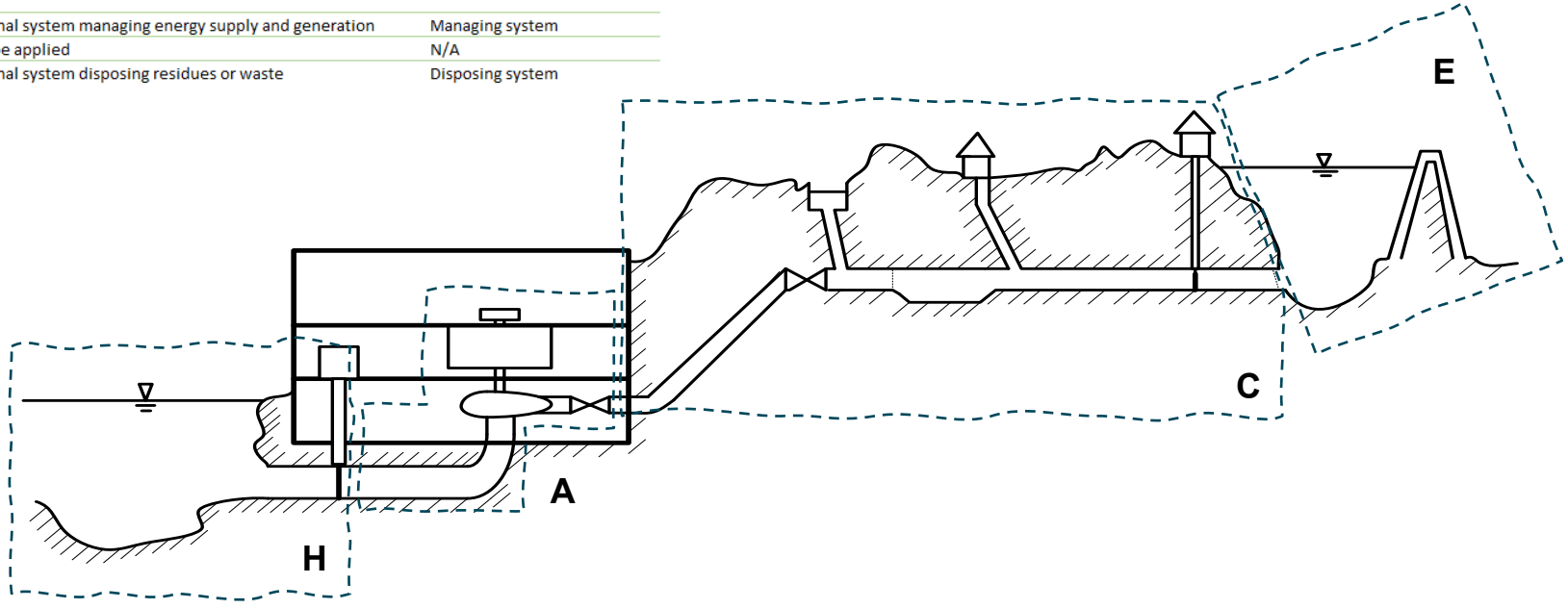
Modelling principles:

CW: Construction identification

Skip

A	Functional system transforming energy or energy carrier	Transforming system
B	Functional system transporting electric power	Electrical transporting system
C	Functional system transporting energy or energy carrier, excluding electric energy	Transporting system
D	Functional system supporting the energy production process	Supporting system
E	Functional system for collecting and storing energy for subsequent retrieval	Storing system
F	Functional system managing energy supply and generation	Managing system
G	Not to be applied	N/A
H	Functional system disposing residues or waste	Disposing system

PS



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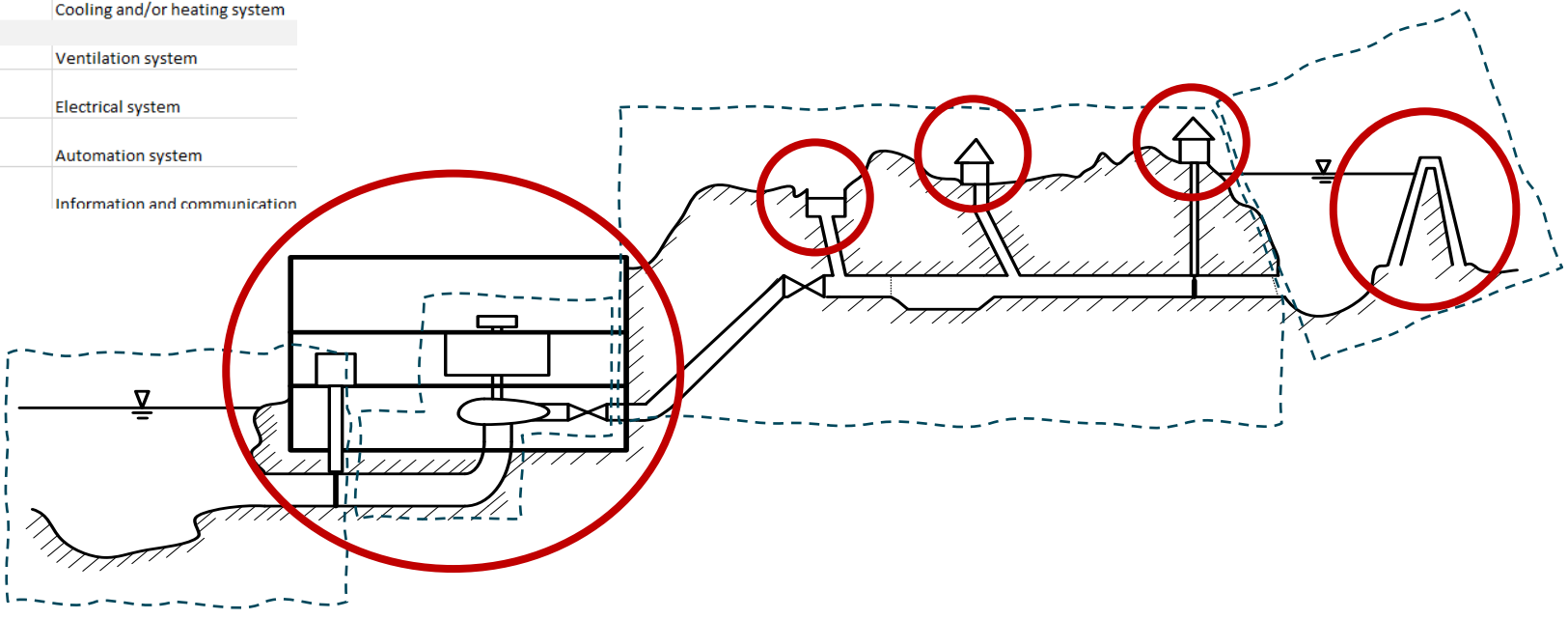
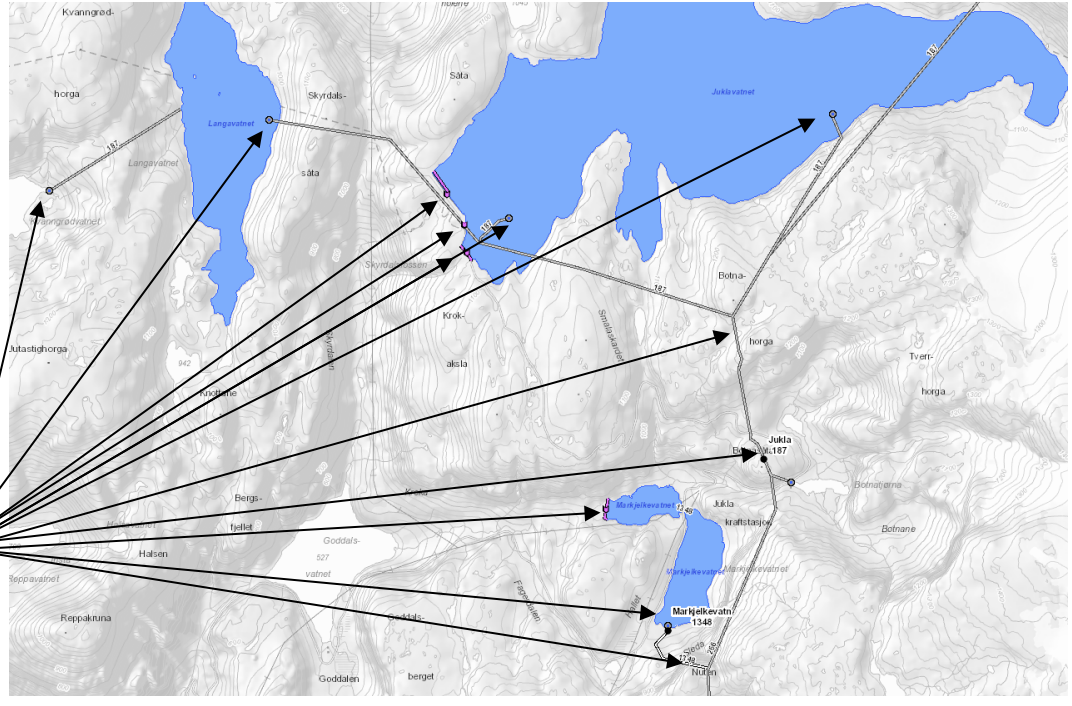
CW

Space systems	
A	Ground system
B	Wall system
C	Slab system
D	Roof system
Installations systems	
E	Gas and air system
F	Water and fluid system
G	Drainage and waste system
H	Cooling and/or heating system
I	
J	Ventilation system
K	Electrical system
L	Automation system
M	Information and communication



Main System: «Wall 45»

<PowerPlant.CW1>=B45



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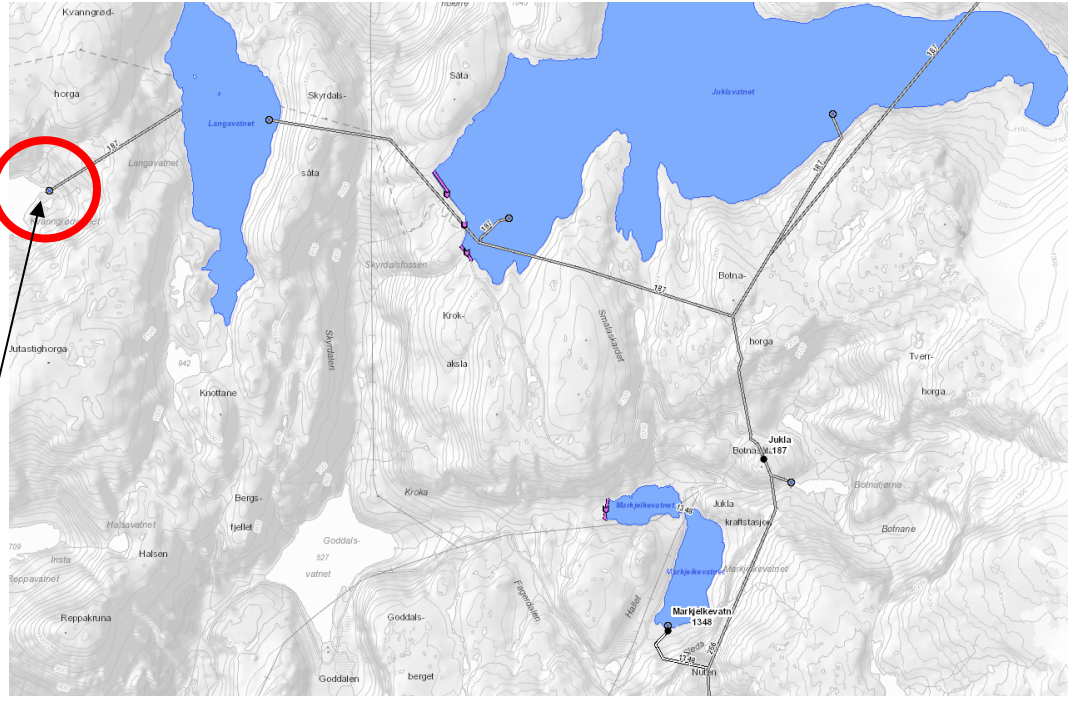
Main System: «Wall 45»



<PowerPlant.CW1>=B45

(Wall between the lavatory and the main hall)

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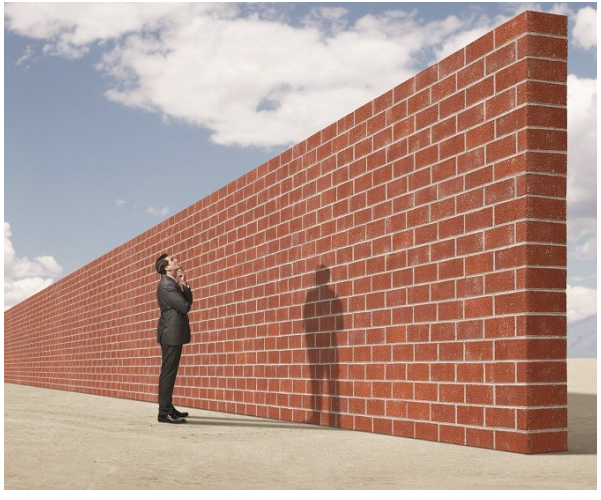
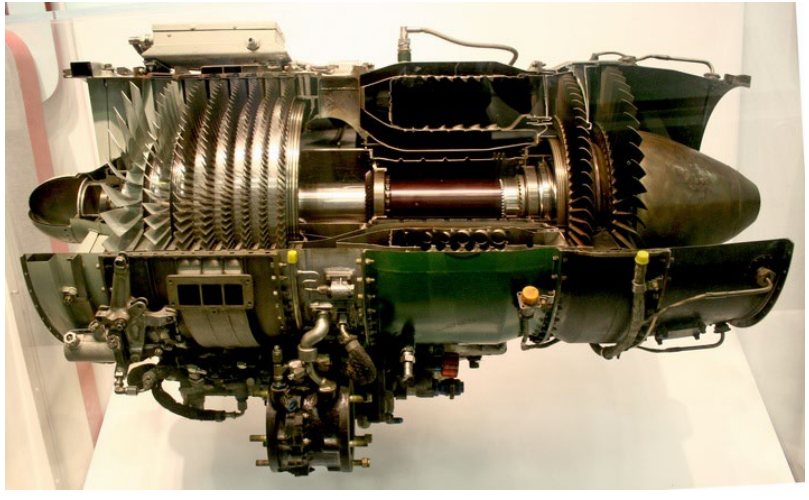
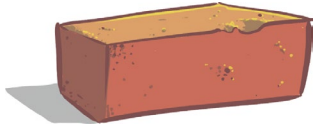
Main System

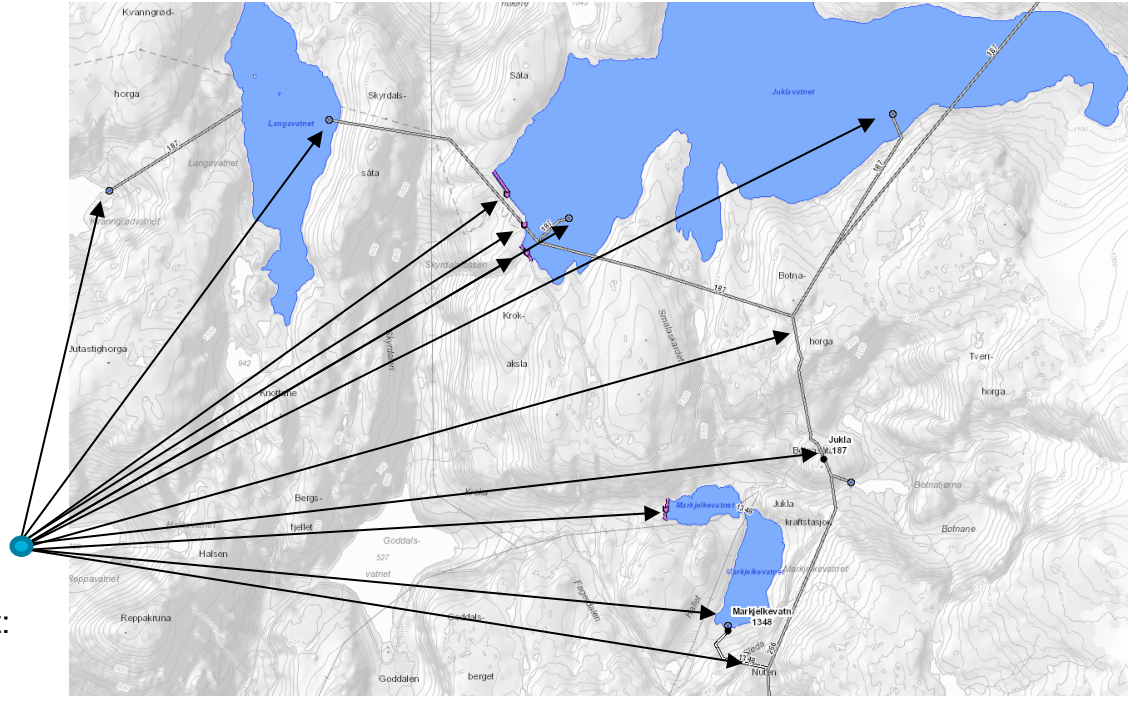


Sub-system





We need something to identify the conctruction entities around the plant:
"**Construction-ID**"



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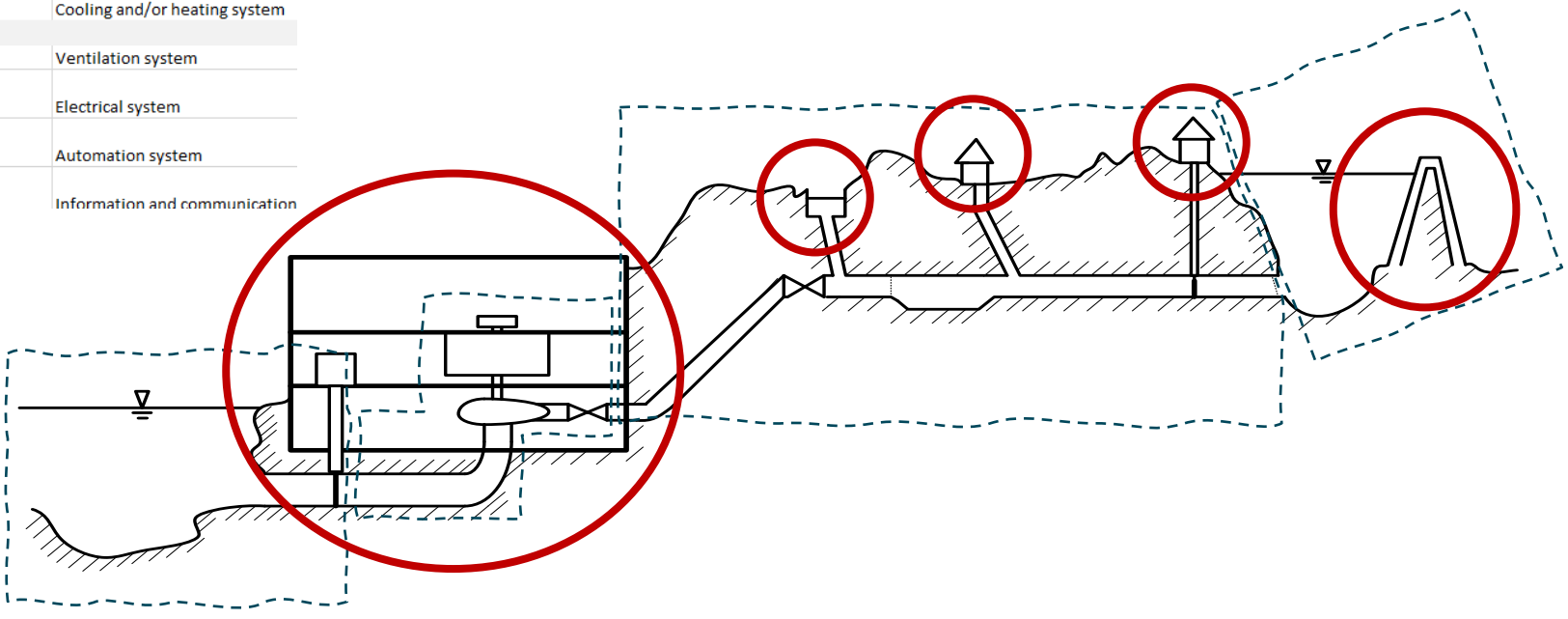
CW

Space systems	
A	Ground system
B	Wall system
C	Slab system
D	Roof system
Installations systems	
E	Gas and air system
F	Water and fluid system
G	Drainage and waste system
H	Cooling and/or heating system
I	
J	Ventilation system
K	Electrical system
L	Automation system
M	Information and communication

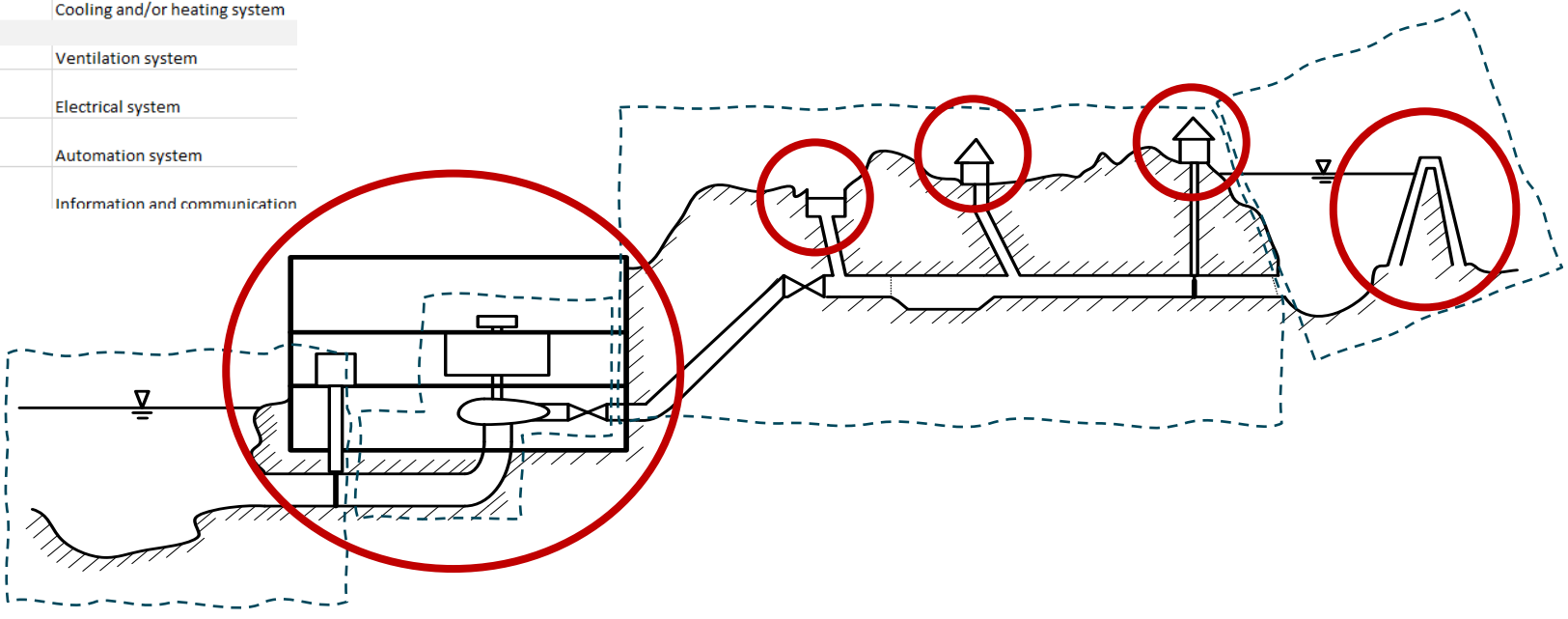


81346 already has classes to identify construction entities. It is used for the ++ site of location aspect!

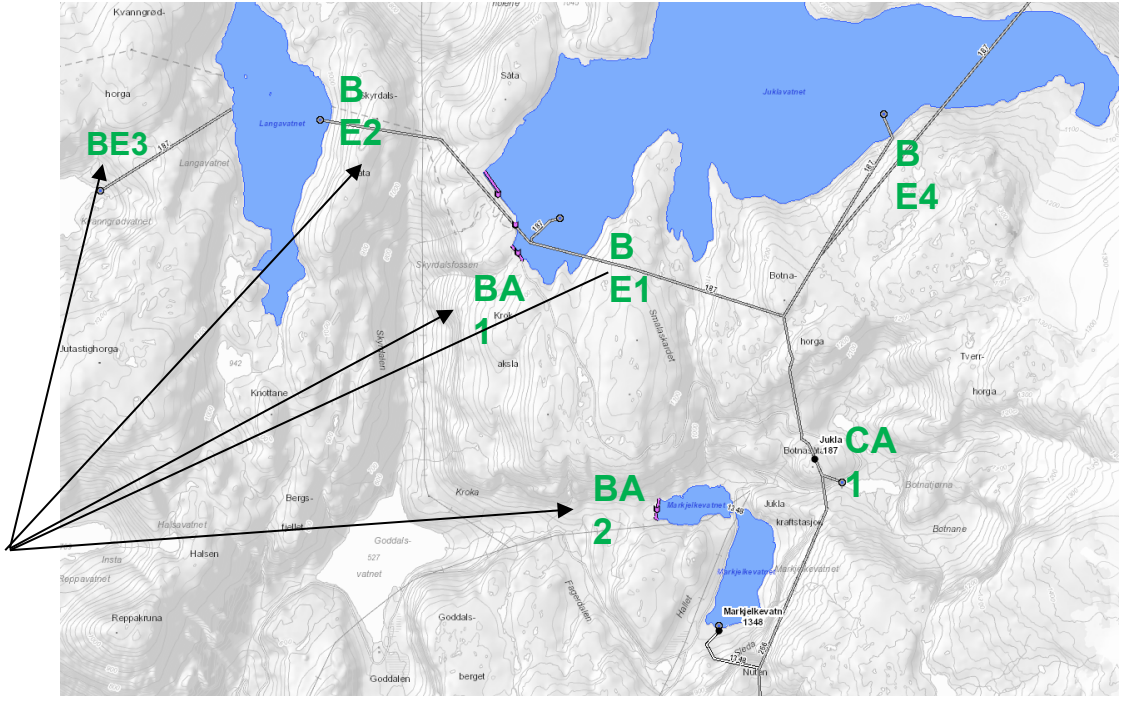
B_		Entity preventing matter from spilling or flowing in an open environement	Dam
	BA	Entity preventing matter from spilling or flowing in an open environement	Dam
	BB	Entity guiding matter in a closed environement	Piping
	BC	Entity guiding matter in a open environement	Canal
	BD	Eontrol entity adjusting matter level	Sluice system
	BE	control entity controlling a flow of matter	Gate
D_		Construction entity for storage	Storage facility
	DA	storage entity for resources	Materials store
	DB	storage entity for moveable technical equipment	Equipment entity (garage)
	DC	Storage entity outside of a building	Open outdoor storage facility
	DD	storage entity for liquids, gas or masses in sealed environment	Silo
	DE	storage entity for liquids or masses in open environment	Reservoir
C_		Construction entity for production and maintenance	Production facility
	CA	production entity for production of electrical energy	Power station

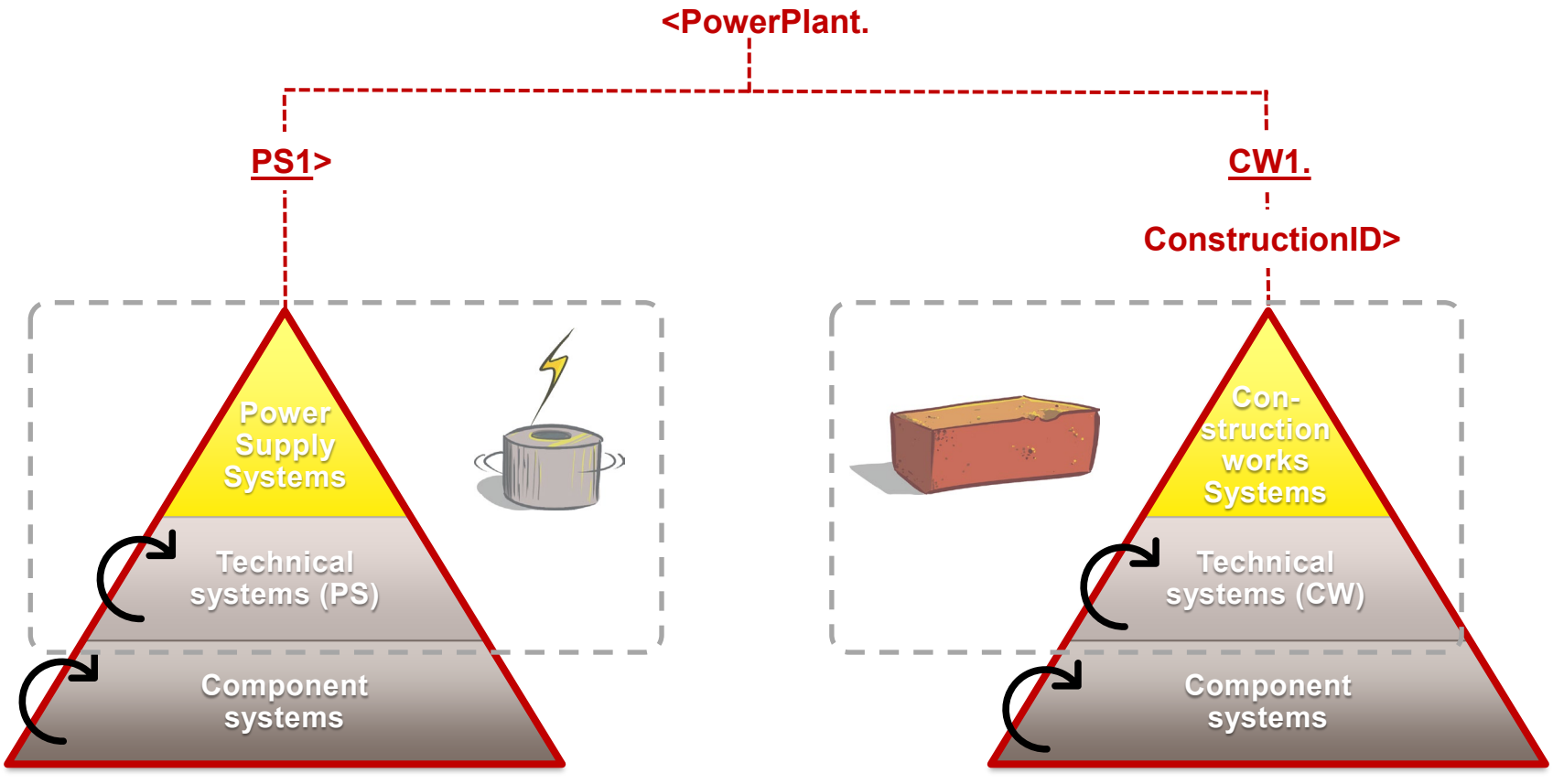
CW

Space systems	
A	Ground system
B	Wall system
C	Slab system
D	Roof system
Installations systems	
E	Gas and air system
F	Water and fluid system
G	Drainage and waste system
H	Cooling and/or heating system
I	
J	Ventilation system
K	Electrical system
L	Automation system
M	Information and communication



We need something to identify the conctruction entities around the plant:
"**Construction-ID**"




<PowerPlant.
PS1>
CW1.
ConstructionID>
Power Supply Systems
Technical systems (PS)
Component systems
Con-struction works Systems
Technical systems (CW)
Component systems

And we're off,

CASES!!

Modelling principles:

Finaly

Confession time

mostly

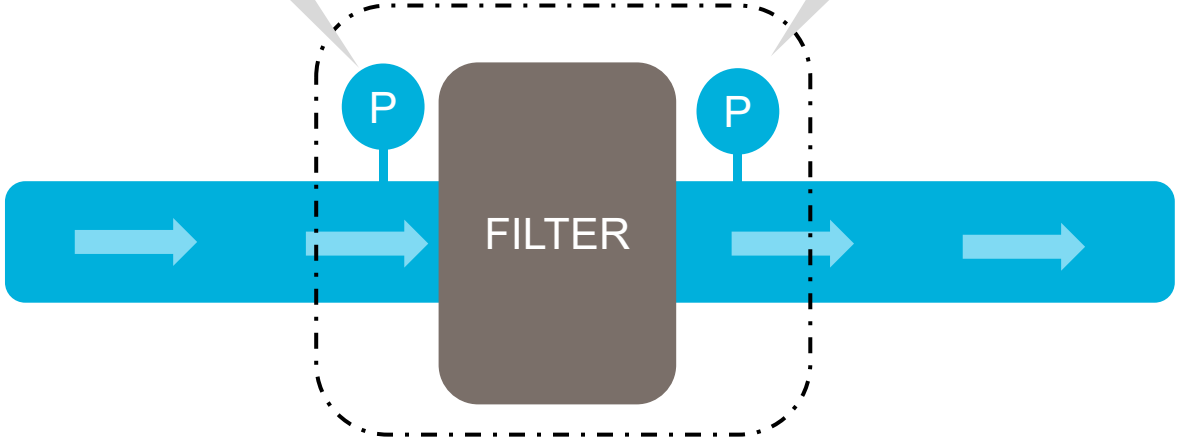
Instantiation (numbering) shall not hold any meaning

BPA1

Pressure measurement **upstream**

BPA2

Pressure measurement **downstream**



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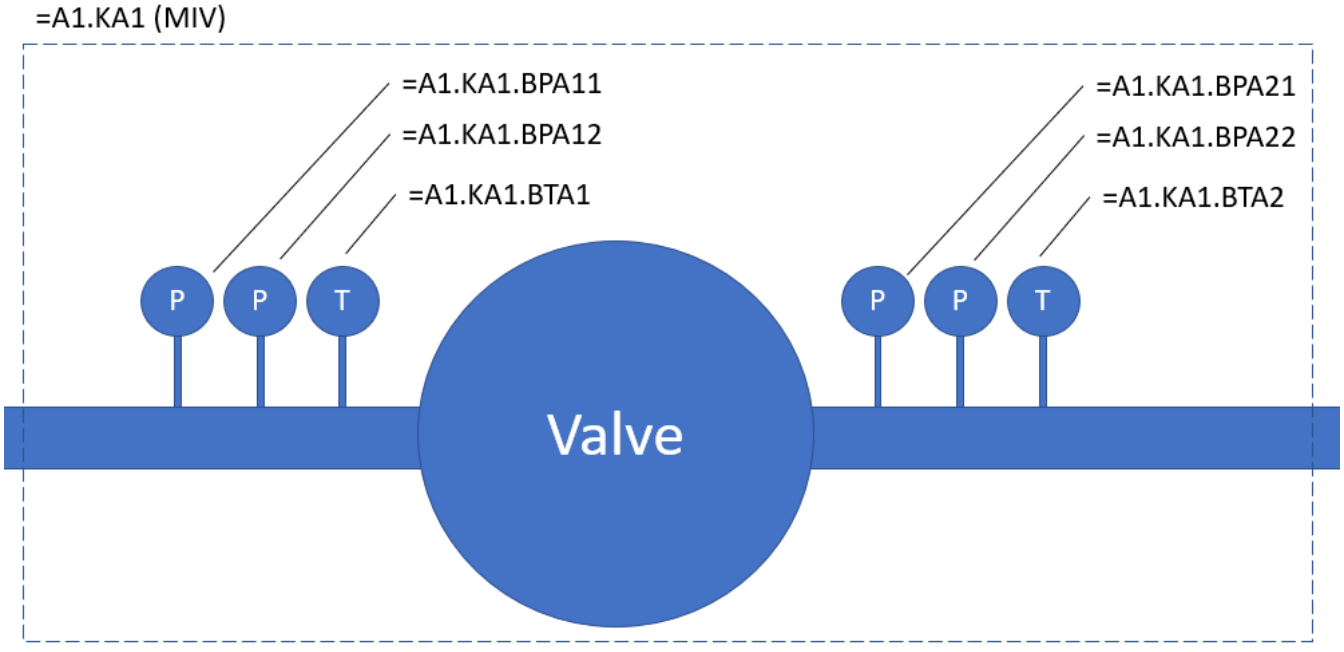
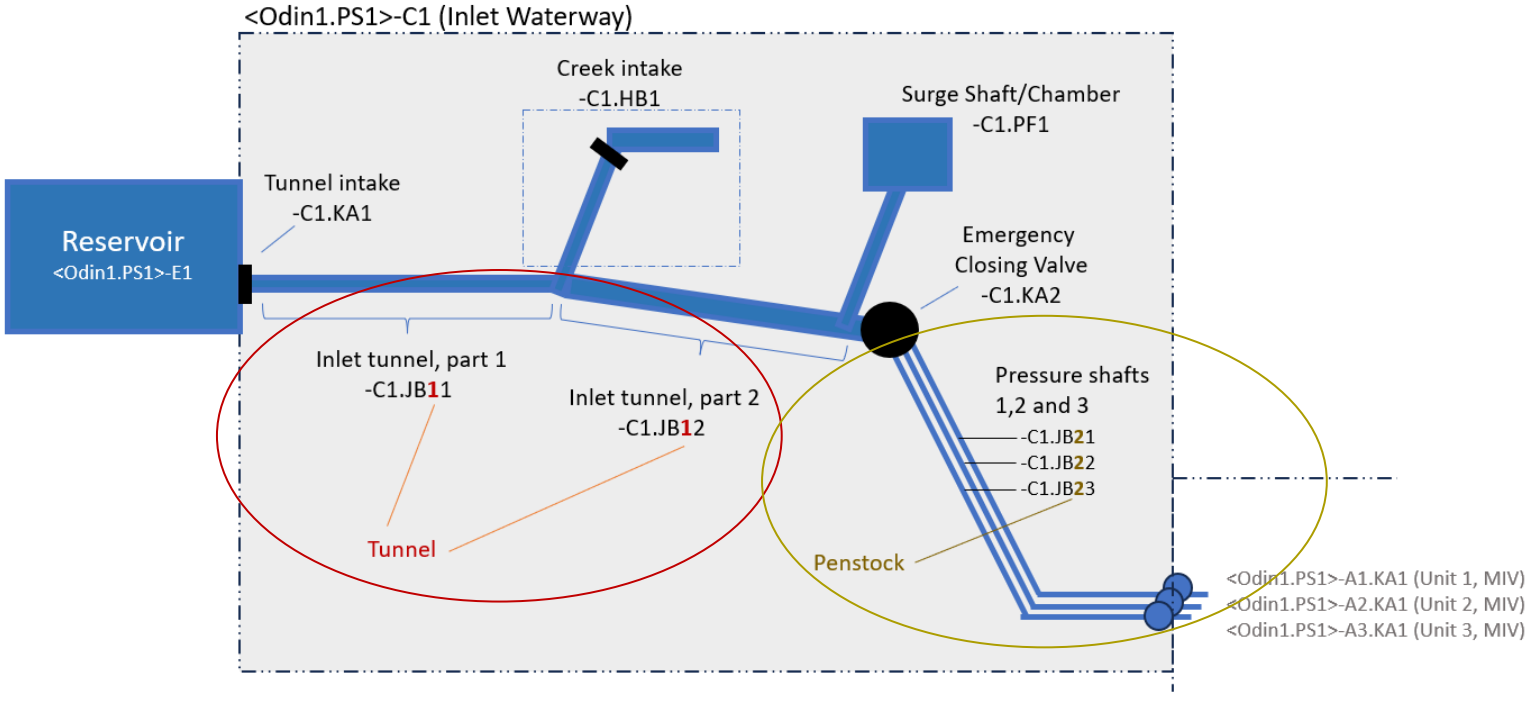

=A1.KA1 (MIV)
=A1.KA1.BPA11
=A1.KA1.BPA12
=A1.KA1.BTA1
=A1.KA1.BPA21
=A1.KA1.BPA22
=A1.KA1.BTA2
P
P
T
P
P
T
Valve


!

Statkraft


<Odin1.PS1>-C1 (Inlet Waterway)
Creek intake
-C1.HB1
Surge Shaft/Chamber
-C1.PF1
Tunnel intake
-C1.KA1
Reservoir
<Odin1.PS1>-E1
Emergency
Closing Valve
-C1.KA2
Inlet tunnel, part 1
-C1.JB11
Inlet tunnel, part 2
-C1.JB12
Pressure shafts
1,2 and 3
-C1.JB21
-C1.JB22
-C1.JB23
Tunnel
Penstock
<Odin1.PS1>-A1.KA1 (Unit 1, MIV)
<Odin1.PS1>-A2.KA1 (Unit 2, MIV)
<Odin1.PS1>-A3.KA1 (Unit 3, MIV)

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