Regional Seminar Series

Stavanger, Norway

AF Speeds Up Time To Solution

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Amitec AS

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About AF

Who: Asle Frantzen
What: Software Engineer
Where: Norway

OSIsoft vCampus All-Star 2010

Amitec is a Value Added Reseller (VAR) for OSIsoft, and has been a partner since 1996

AMITEC
REALTIME INFORMATION

Experiences from Project

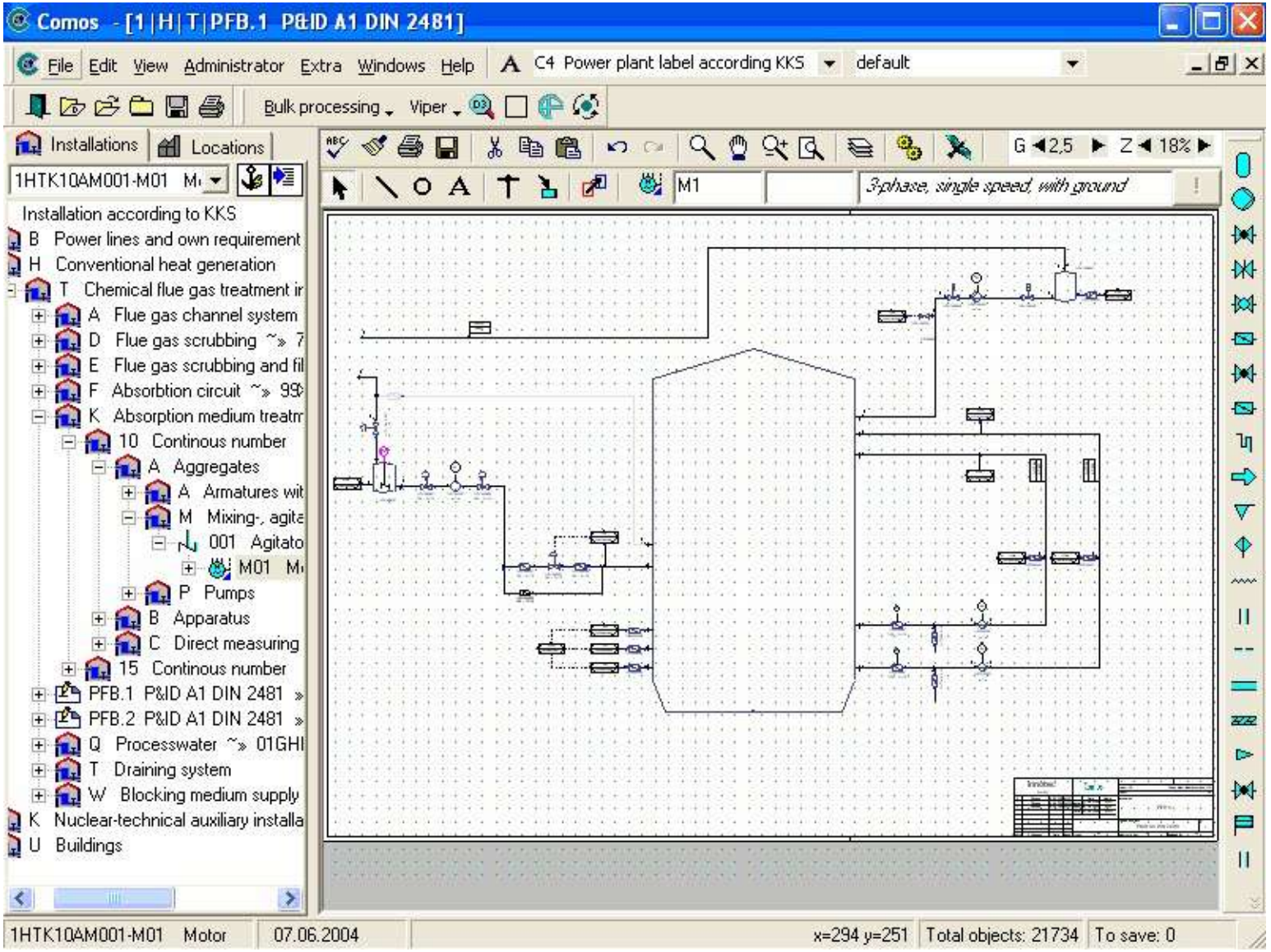
- Customer in the Oil & Gas sector
  - Offshore operation – North Sea
  - Company's first operatorship

- Building everything from scratch
  - New organization / people
  - New Oil/Gas rig
  - Cooperation with experienced oil field developer

Asset Management

- Customer uses a system called COMOS
  - Life Cycle Asset Information Management system
  - Instruments, gauges, valves, etc. (production)
    - » ***AND***
  - Heaters, fire extinguishers, etc. (living quarters)

COMOS



Looking at the Data

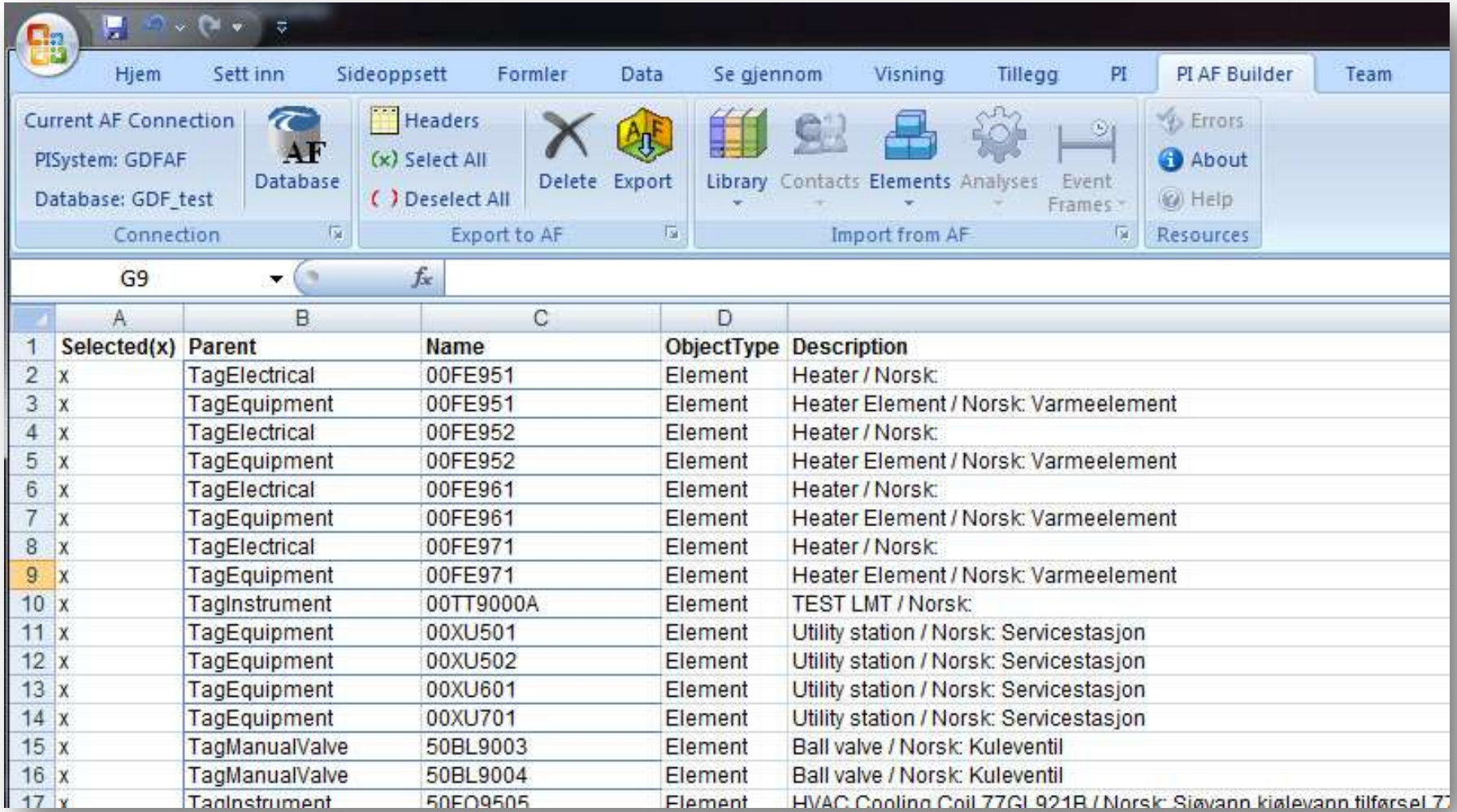
- Multiple MS Access .MDB files
  - Over 100.000 records, with 23 attributes each

	L	M	N	O	P	Q	R	S	T	U	V	W	
1	F12	F13	F14	F15	F16	F17	F18	F19	F20	F21	F22	F23	ComosSystemInfo
2	Overall Criticality	Is field equipment	Is electrical consum	Norsok component descripion	Parent tag	Location co	Object stat	Discipline	Tag category	Sequence N	Function co	System N	@@UU@@C@@AADGiAB3cWQpSm
3	High	Y	N	Ndstopp tilbakespylings motor	50CA001	P142	Planned	E - Electrical	TagElectrical		S	50	@@UU@@C@@AAQMAAK0SQhzI
4	High	Y	N		50JX601	F0	Planned	E - Electrical	TagElectrical		H	50	@@UU@@C@@AAPAAAKBSUpzI
5	High	Y	N		50JX601	F0	Planned	E - Electrical	TagElectrical		B	50	@@UU@@C@@AAQAAAKpSQpjI-
6	High	Y	N		50JX601	F0	Planned	E - Electrical	TagElectrical		S	50	@@UU@@C@@AAPqAAKdQQpjG
7	Evaluation is required					Q123	reserved					50	@@UU@@C@@AAPuAAKhSQhim
8	High	Y	N	NDSTOPP FOR SJVANNSLFTEPUMPE MOTOR		R30S	Planned	E - Electrical	TagElectrical		S	50	@@UU@@C@@AAQEAAKrSQhjm
9	Evaluation is required					Q123	reserved					50	@@UU@@C@@AAPuAAKhSQhim
10	High	Y	N	NDSTOPP FOR SJVANNSLFTEPUMPE MOTOR		R30S	Planned	E - Electrical	TagElectrical		S	50	@@UU@@C@@AAQEAAKrSQhjlM
11	Evaluation is required					Q123	reserved					50	@@UU@@C@@AAPuAAKfSQhim
12	High	Y	N	NDSTOPP FOR SJVANNSLFTEPUMPE MOTOR		R30S	Planned	E - Electrical	TagElectrical		S	50	@@UU@@C@@AAQEAAKvSQhjlK
13	High	Y	N	NDSTOPP FOR SJVANNSHJELPEPUMPE MOTOR		Q30N	Planned	E - Electrical	TagElectrical		S	50	@@UU@@C@@AAQYAAK4SQhjG
14	High	Y	N	NDSTOPP FOR SJVANNSHJELPEPUMPE MOTOR		Q30N	Planned	E - Electrical	TagElectrical		S	50	@@UU@@C@@AAQYAAK4SQhjm
15	High	Y	N	NDSTOPP FOR MOTOR TRYKKVEDLIKEHOLDSPUMPE		Q111	Planned	E - Electrical	TagElectrical		S	50	@@UU@@C@@AAQOAAK3SQhim
16	High	Y	N	NDSTOPP FOR MOTOR TRYKKVEDLIKEHOLDSPUMPE		Q111	Planned	E - Electrical	TagElectrical		S	50	@@UU@@C@@AAQOAAK5SQhim
17	High	Y	N	NDSTOPP FOR OLJETRYKKSPUMPE MOTOR		R30S	Planned	E - Electrical	TagElectrical		S	50	@@UU@@C@@AAQeAAK8SQhjFI
18	High	Y	N	NDSTOPP FOR OLJETRYKKSPUMPE MOTOR		R30S	Planned	E - Electrical	TagElectrical		S	50	@@UU@@C@@AAQeAAK8QQhTI
19	High	Y	N	NDSTOPP FOR OLJETRYKKSPUMPE MOTOR		R30S	Planned	E - Electrical	TagElectrical		S	50	@@UU@@C@@AAQeAAK8QQhjF
20	High	Y	N	NDSTOPP FOR OLJETRYKKSPUMPE MOTOR		Q414	Planned	E - Electrical	TagElectrical		S	50	@@UU@@C@@AAQeAAK8QQpTI
21	High	Y	N	NDSTOPP FOR OLJETRYKKSPUMPE MOTOR		Q414	Planned	E - Electrical	TagElectrical		S	50	@@UU@@C@@AAQeAAK+SQpTI
22	High	Y	N	NDSTOPP FOR KJLEOLJE SIRKULASJONSPUMPE MOT		R30S	Planned	E - Electrical	TagElectrical		S	50	@@UU@@C@@AAQWAAK0SQhT
23	High	Y	N	NDSTOPP FOR KJLEOLJE SIRKULASJONSPUMPE MOT		R30S	Planned	E - Electrical	TagElectrical		S	50	@@UU@@C@@AAQWAAK2SQhT
24	High	Y	N	NDSTOPP FOR KJLEOLJE SIRKULASJONSPUMPE MOT		R30S	Planned	E - Electrical	TagElectrical		S	50	@@UU@@C@@AAQWAAK2QQhT
25	High	Y	N	NDSTOPP FOR KJLEOLJE SIRKULASJONSPUMPE MOT		Q414	Planned	E - Electrical	TagElectrical		S	50	@@UU@@C@@AAQWAAK2SQhT
26	High	Y	N	NDSTOPP FOR KJLEOLJE SIRKULASJONSPUMPE MOT		Q414	Planned	E - Electrical	TagElectrical		S	50	@@UU@@C@@AAQWAAK2SQhT
27	High	Y	N			F0	Planned	E - Electrical	TagElectrical		S	50	@@UU@@C@@AAPmAAKdQQpT
28	High	Y	N	HOVEDFILTER SJVANN	50XX001	P142	Planned	R - Mechanical	TagEquipment	001	CA	50	@@UU@@C@@AAOWAAJgSUpjG
29	High	Y	N	SJVANN TILBAKESPYLING SYST. -MOTOR	50CA001	P142	Planned	R - Mechanical	TagEquipment		M	50	@@UU@@C@@AAPGAAKCQQpj(
30	High	Y	N	Filter med integrert oppvarming	50JX601	F0	Planned	J - Automation	TagEquipment	100	CA	50	@@UU@@C@@AAOoAAJsSUpjm
31	High	Y	N	Drpefanger	50JX601	F0	Planned	J - Automation	TagEquipment	101	CA	50	@@UU@@C@@AAN+AAJSSUpjGI
32	High	Y	N	OLJESIRKULASJONSFILTER	50CS001A	R30S	Planned	R - Mechanical	TagEquipment	001	CB	50	@@UU@@C@@AAOgAAJjSUpzGI
33	High	Y	N	OLJESIRKULASJONSFILTER	50CS001B	R30S	Planned	R - Mechanical	TagEquipment	001	CB	50	@@UU@@C@@AAOgAAJjSUpzG(
34	High	Y	N	OLJESIRKULASJONSFILTER	50CS001C	R30S	Planned	R - Mechanical	TagEquipment	001	CB	50	@@UU@@C@@AAOgAAJlSUpzG(
35	High	Y	N	BEREDSKAPSFILTER SJVANN	50-HIERARCHY	P142	Planned	R - Mechanical	TagEquipment	002	CB	50	@@UU@@C@@AAOcAAJjSUpzmI
36	High	Y	N	PFYLLINGSFILTER OLJESIRKULASJON	50CS001A	R30S	Planned	R - Mechanical	TagEquipment	011	CB	50	@@UU@@C@@AAOwAAJsSUpzG
37	High	Y	N	PFYLLINGSFILTER OLJESIRKULASJON	50CS001B	R30S	Planned	R - Mechanical	TagEquipment	011	CB	50	@@UU@@C@@AAOwAAJqSUpzG
38	High	Y	N	PFYLLINGSFILTER OLJESIRKULASJON	50CS001C	R30S	Planned	R - Mechanical	TagEquipment	011	CB	50	@@UU@@C@@AAOwAAJsSUpzG
39	High	Y	N	PFYLLINGSFILTER OLJESIRKULASJON	50CS002A	Q414	Planned	R - Mechanical	TagEquipment	012	CB	50	@@UU@@C@@AAOwAAJuSUpzG
40	High	Y	N	PFYLLINGSFILTER OLJESIRKULASJON	50CS002B	Q414	Planned	R - Mechanical	TagEquipment	012	CB	50	@@UU@@C@@AAOwAAJsSUpzG
41	High	Y	N	OLJESIRKULASJONSFILTER	50CS002A	Q414	Planned	R - Mechanical	TagEquipment	022	CB	50	@@UU@@C@@AAOgAAJjSUpjGM
42	High	Y	N	OLJESIRKULASJONSFILTER	50CS002B	Q414	Planned	R - Mechanical	TagEquipment	022	CB	50	@@UU@@C@@AAOgAAJjSUpzG(
43	High	Y	N	OLJESIRKULASJONSENHET	50PA001A	R30S	Planned	R - Mechanical	TagEquipment	001	CS	50	@@UU@@C@@AAOcAAJhSUpjmI
44	High	Y	N	OLJESIRKULASJONSENHET	50PA001B	R30S	Planned	R - Mechanical	TagEquipment	001	CS	50	@@UU@@C@@AAOcAAJhSUpjmI
45	High	Y	N	OLJESIRKULASJONSENHET	50PA001C	R30S	Planned	R - Mechanical	TagEquipment	001	CS	50	@@UU@@C@@AAOcAAJhSUpjmI
46	High	Y	N	OLJESIRKULASJONSENHET	50PA002A	Q414	Planned	R - Mechanical	TagEquipment	002	CS	50	@@UU@@C@@AAOcAAJhSUpjmI
47	High	Y	N	OLJESIRKULASJONSENHET	50PA002B	Q414	Planned	R - Mechanical	TagEquipment	002	CS	50	@@UU@@C@@AAOcAAJjSUsjmM
48	High	Y	N	INNLPSSLANGE SJVANNSPUMPE	50PA001A	N41	Planned	R - Mechanical	TagEquipment	001	CX	50	@@UU@@C@@AAOmAAJoSUsTr
49	High	Y	N	INNLPSSLANGE SJVANNSPUMPE	50PA001B	N41	Planned	R - Mechanical	TagEquipment	001	CX	50	@@UU@@C@@AAOmAAJoSUsjm

Ways of Importing Data into AF

- Using the AFBuilder plugin for Excel
  - *Requires configuration (GUI)*
- Using the AFImport command line tool
  - *Requires data preparation*
- Using the AF SDK
  - *Requires coding*

AFBuilder Plugin for Excel



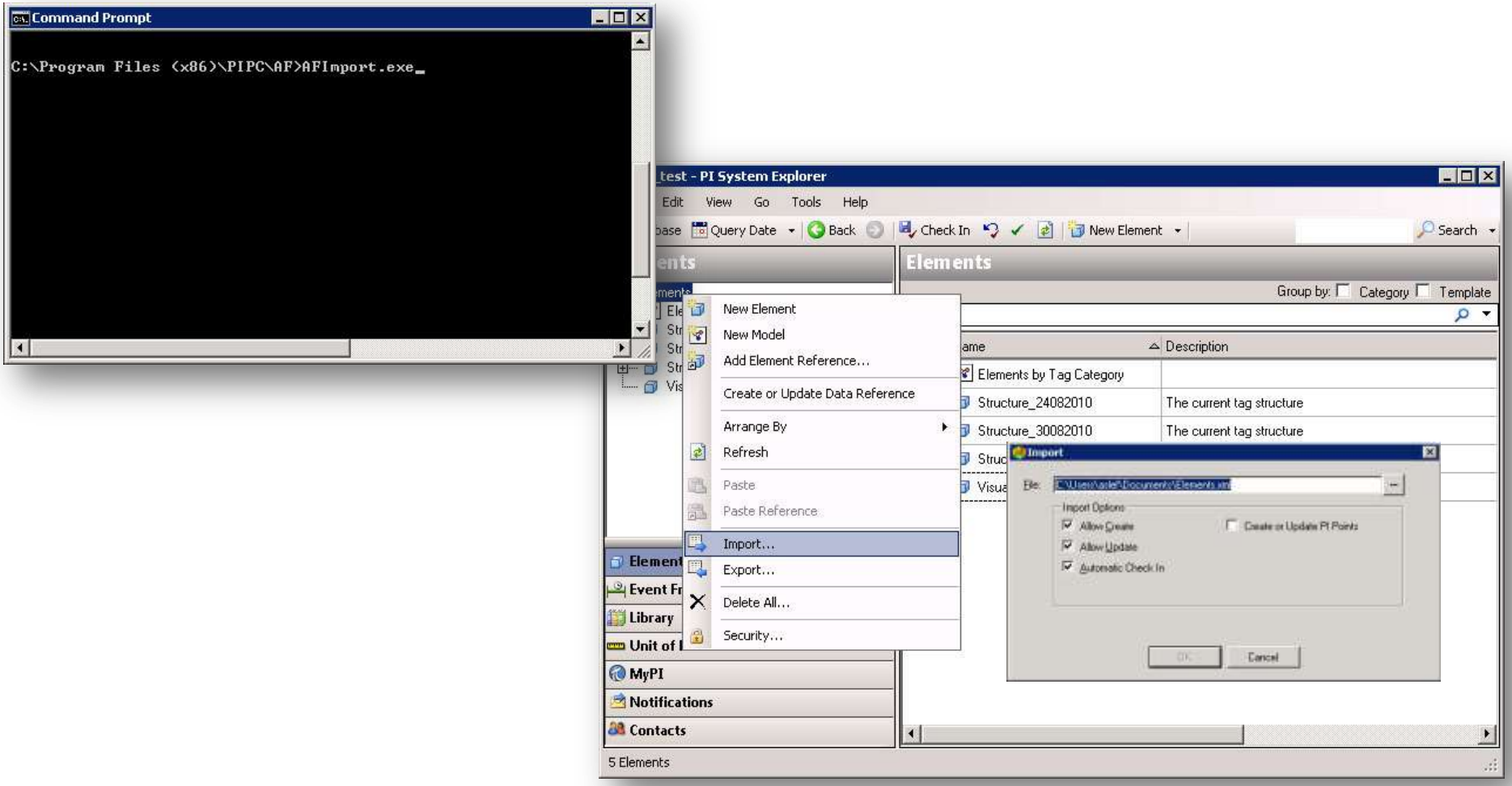
	A	B	C	D	
1	**Selected(x)**	**Parent**	**Name**	**ObjectType**	**Description**
2	x	TagElectrical	00FE951	Element	Heater / Norsk:
3	x	TagEquipment	00FE951	Element	Heater Element / Norsk: Varmeelement
4	x	TagElectrical	00FE952	Element	Heater / Norsk:
5	x	TagEquipment	00FE952	Element	Heater Element / Norsk: Varmeelement
6	x	TagElectrical	00FE961	Element	Heater / Norsk:
7	x	TagEquipment	00FE961	Element	Heater Element / Norsk: Varmeelement
8	x	TagElectrical	00FE971	Element	Heater / Norsk:
9	x	TagEquipment	00FE971	Element	Heater Element / Norsk: Varmeelement
10	x	TagInstrument	00TT9000A	Element	TEST LMT / Norsk:
11	x	TagEquipment	00XU501	Element	Utility station / Norsk: Servicestasjon
12	x	TagEquipment	00XU502	Element	Utility station / Norsk: Servicestasjon
13	x	TagEquipment	00XU601	Element	Utility station / Norsk: Servicestasjon
14	x	TagEquipment	00XU701	Element	Utility station / Norsk: Servicestasjon
15	x	TagManualValve	50BL9003	Element	Ball valve / Norsk: Kuleventil
16	x	TagManualValve	50BL9004	Element	Ball valve / Norsk: Kuleventil
17	x	TagInstrument	50EQ9505	Element	HVAC Cooling Coil 77GL 921B / Norsk: Sjøvann kjølevann tilførsel 77

AFBuilder Plugin for Excel

- Testing the performance:
  - Amount of records: 13.500
  - Time spent: 314 minutes (5 hrs 14 mins)
  - Avg: 43 elements / minute

AFImport Command Line Tool

(Same as importing in PI System Explorer)



AFImport Command Line Tool

(Same as importing in PI System Explorer)

- Testing the performance:
  - Amount of records: 13.500
  - Time spent: 20 minutes 52 seconds
  - Avg: 647 elements / minute

AF SDK in Visual Studio

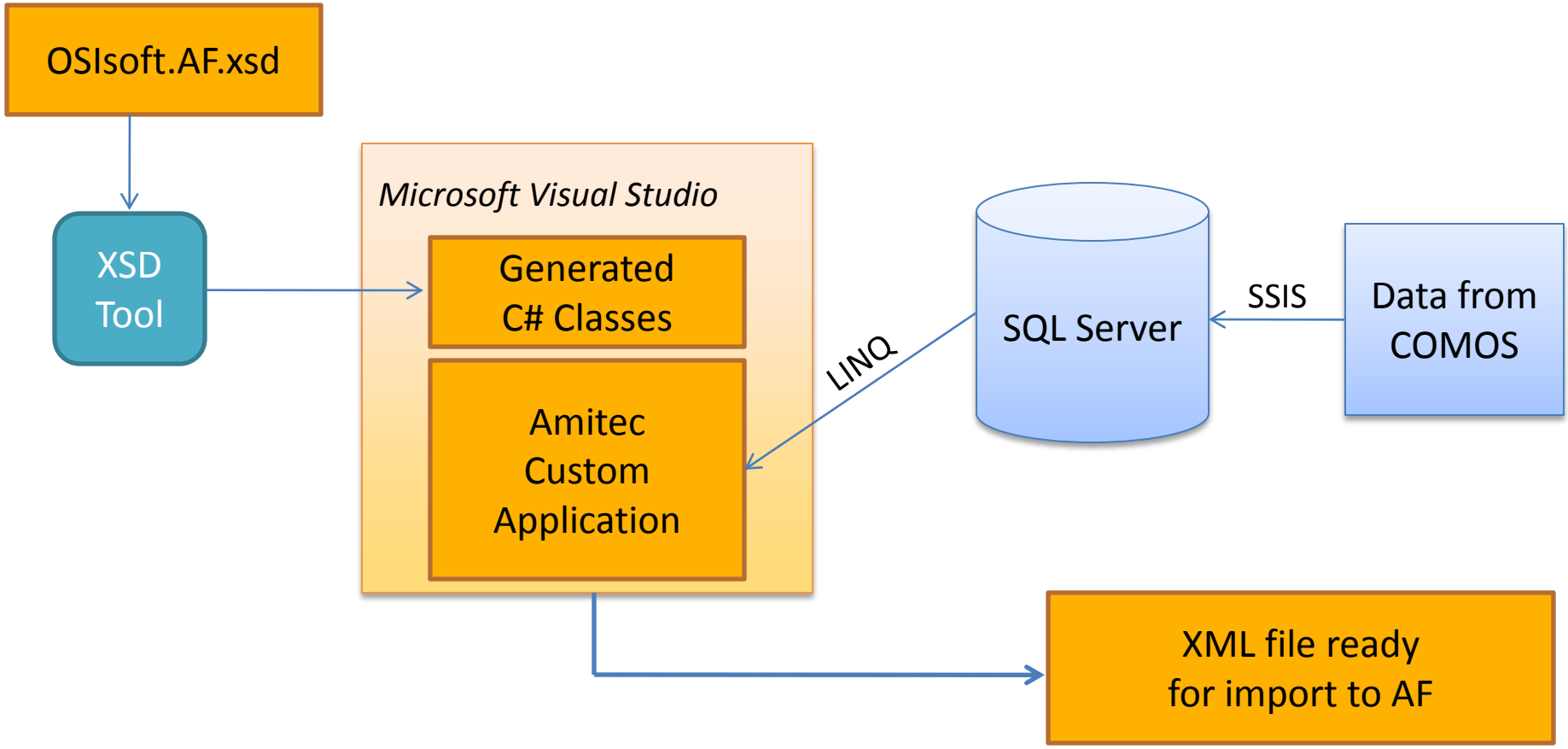
- Testing the performance:
  - Avg: 42 elements / minute *

**** Quick test done without any form of code optimization***

Our Preferred Way?

AFImport command line tool

Preparing the Data

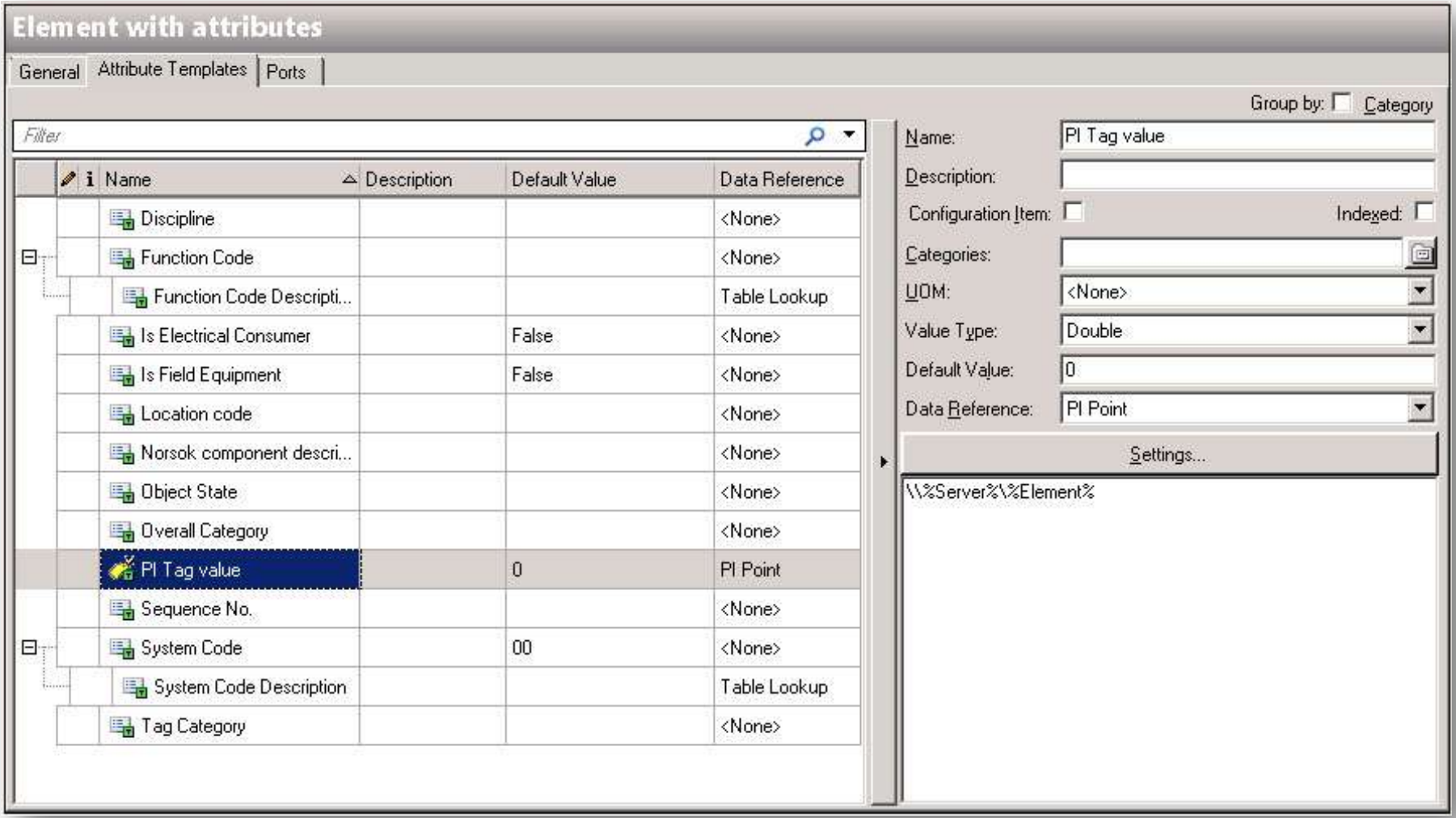


Generating the Data

- First attempt:
  - Generated XML file in appr. 30 seconds
  - 7.2 Million lines / 256 MB
  - 133.430 elements, with 5-10 attributes each

  - Imported to AF:
    - Total time of 245 minutes (4 hrs 5 mins)
    - Avg: 544 elements / minute

Optimizing Speed with Templates



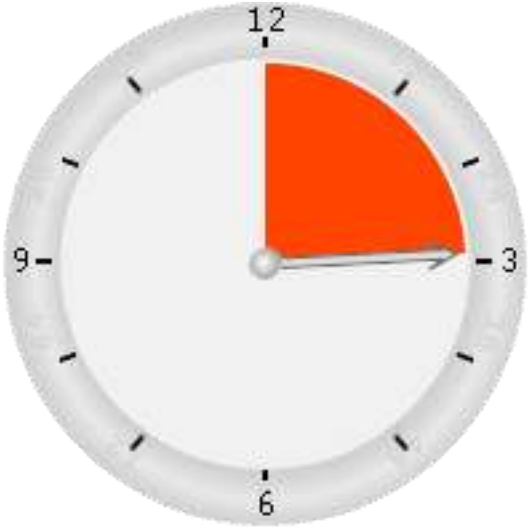
Generating the Data

- Second attempt – using Element Template:
  - Generated XML file in appr. 25 seconds
  - 5.5 Million lines / 190 MB
  - 133.430 elements based on an Element Template

  - Imported to AF:
    - Total time of 175 minutes (2 hrs 55 mins)
    - Avg: 762 elements / minute

Importing the Data

Without Template



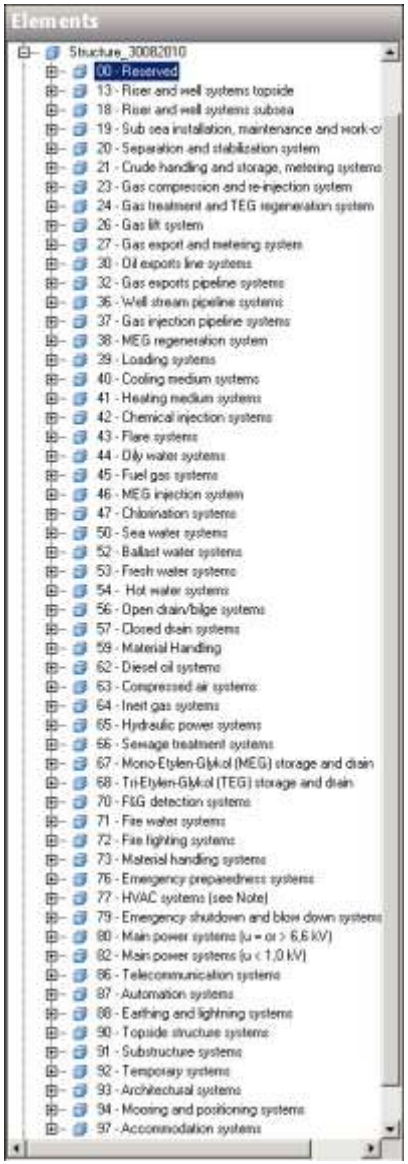
With Template

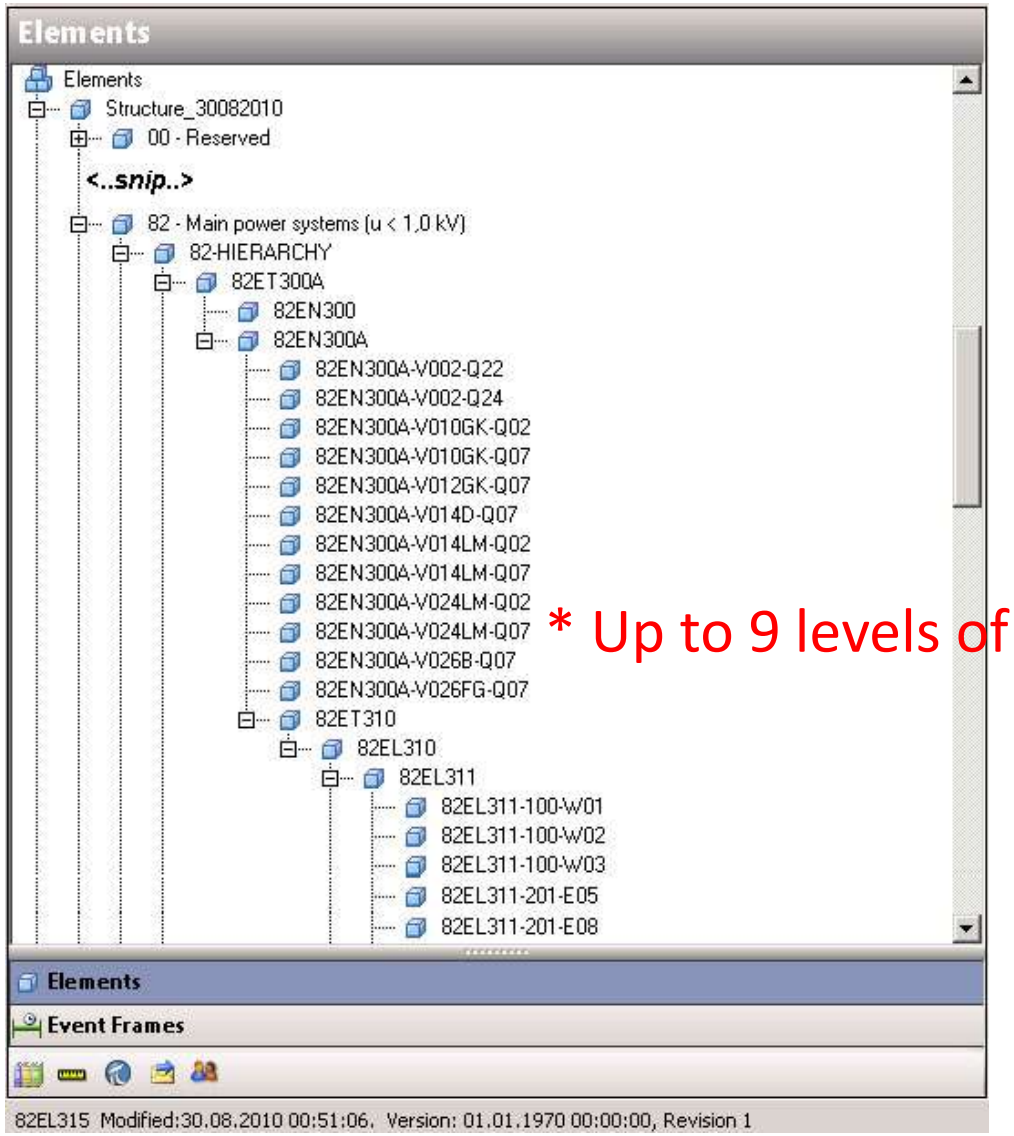
Importing the Data

- Upgrading to AF Server 2010
  - Major improvement in time
    - Over 130.000 elements now imported in 8 mins. 45 secs.
    - Avg: >15000 elements / minute

= 95% reduction in time

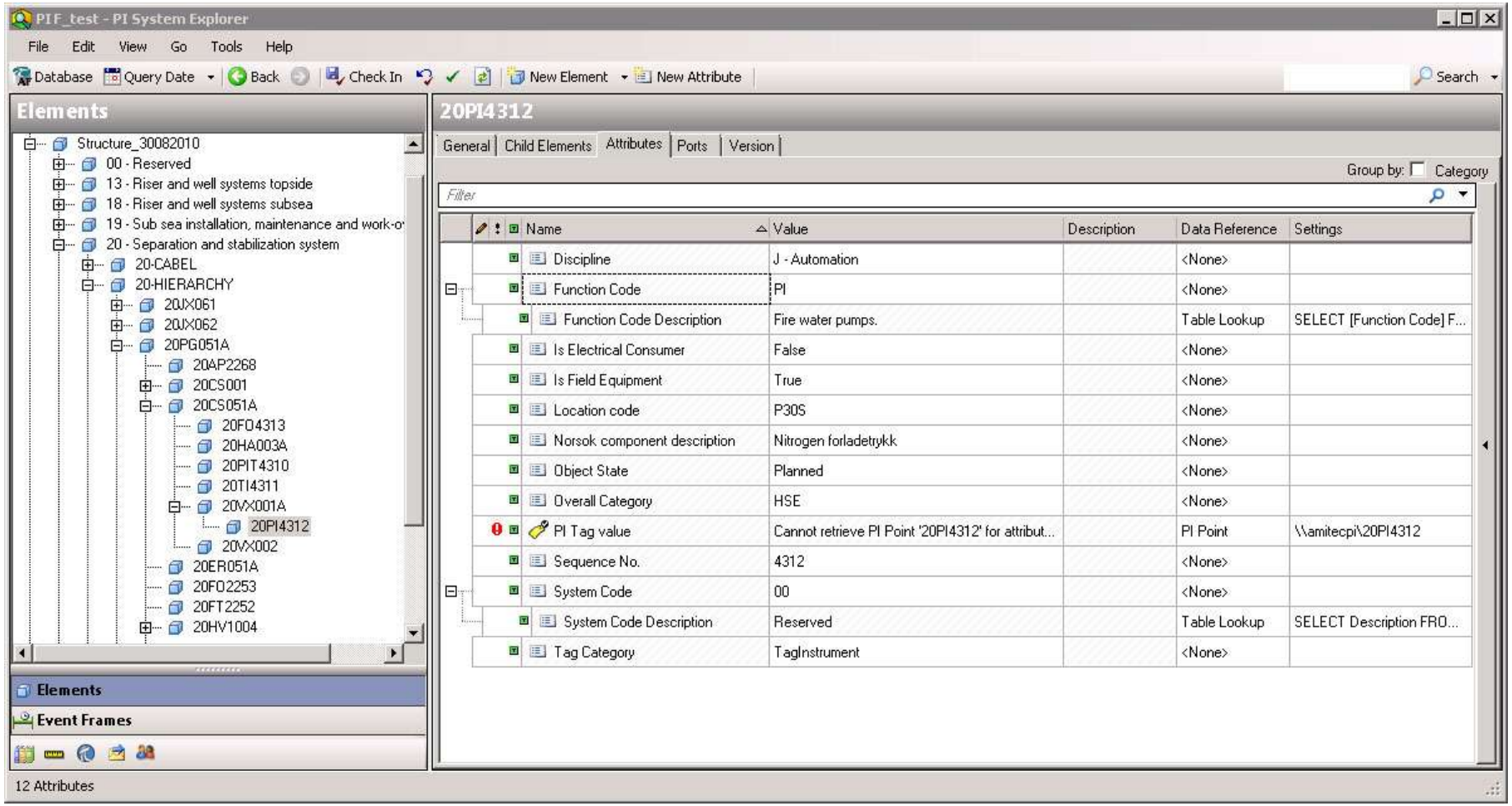
The Imported Tag Structure



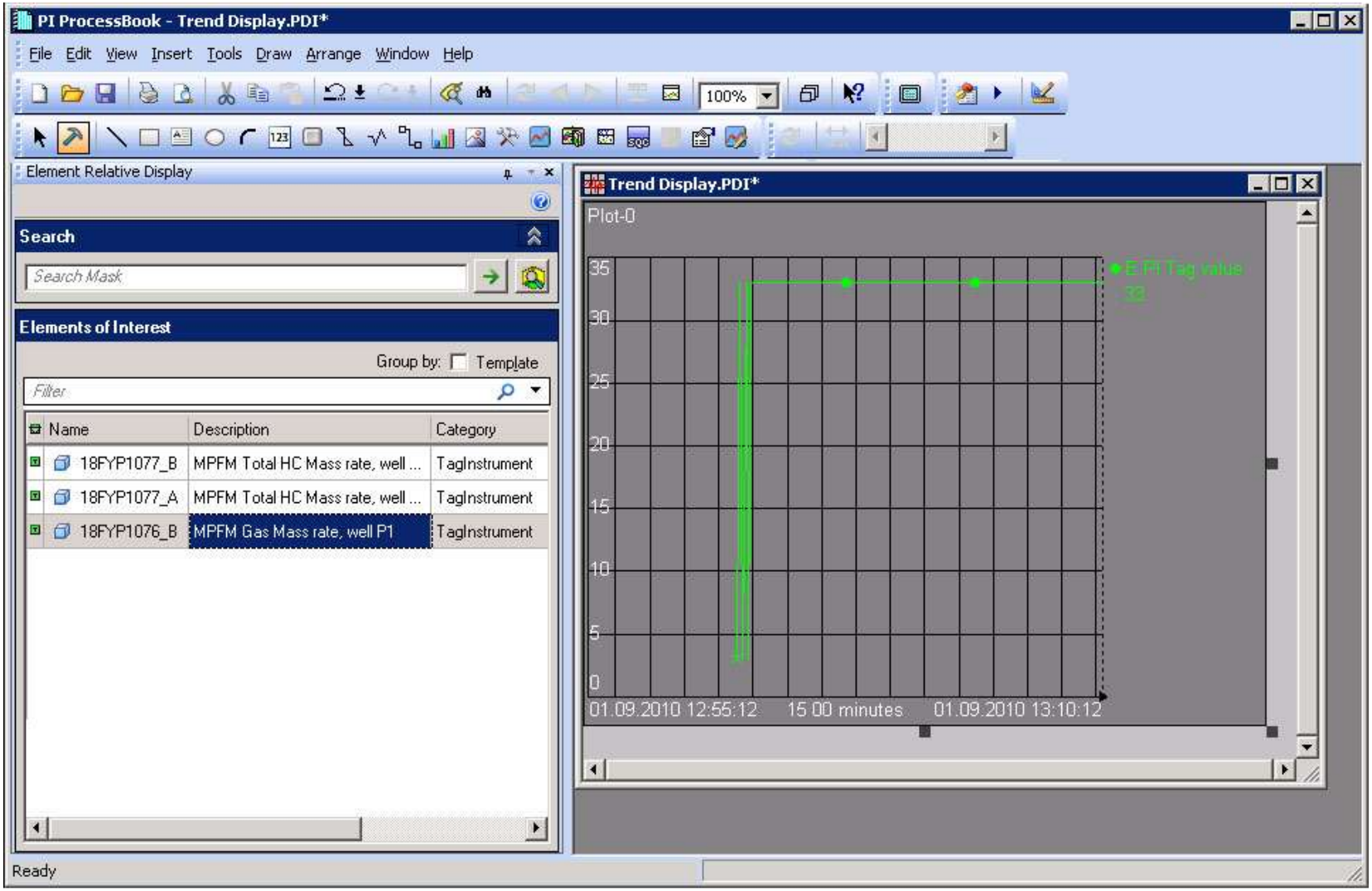


* Up to 9 levels of elements

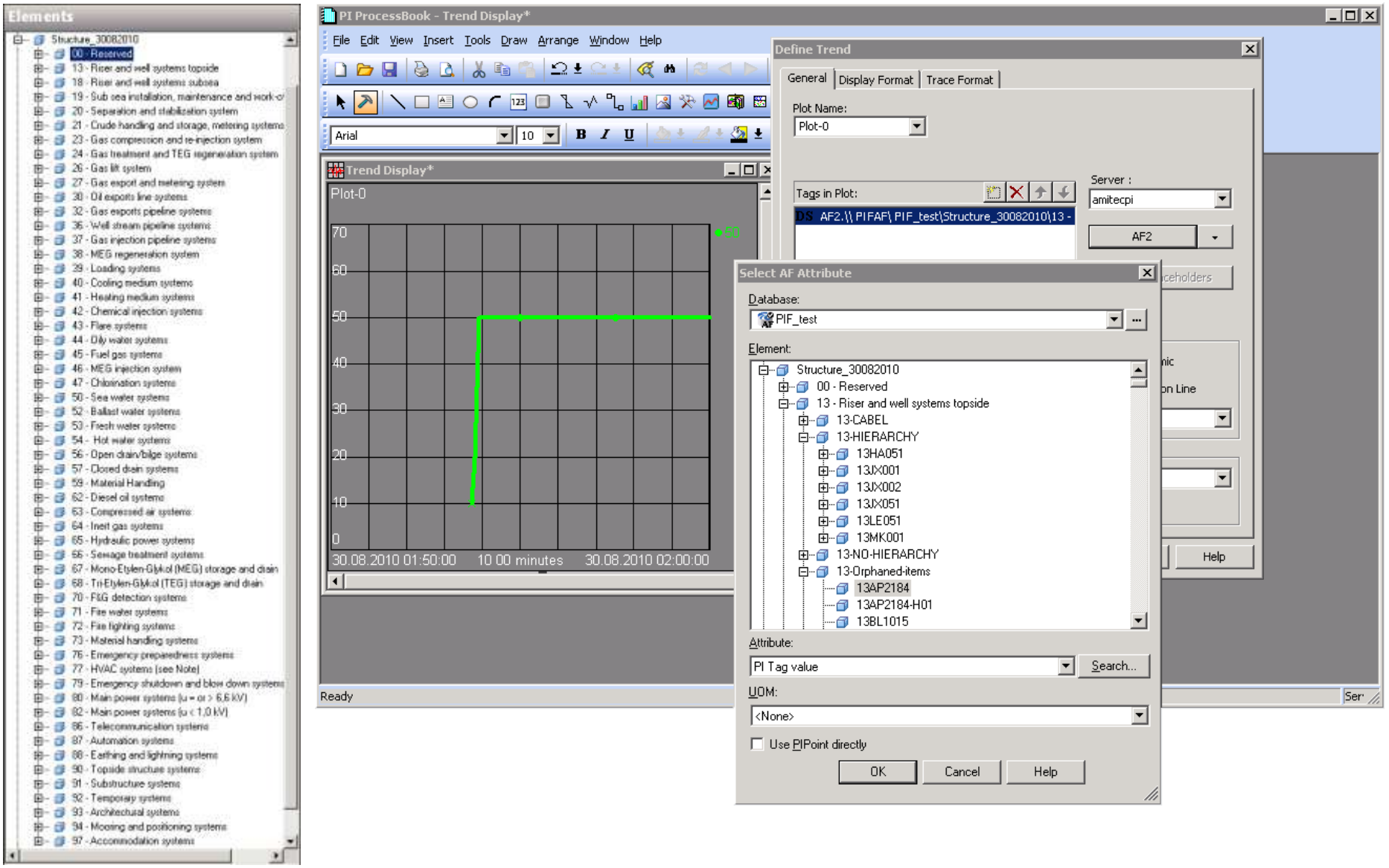
PI AF = Value for the Users



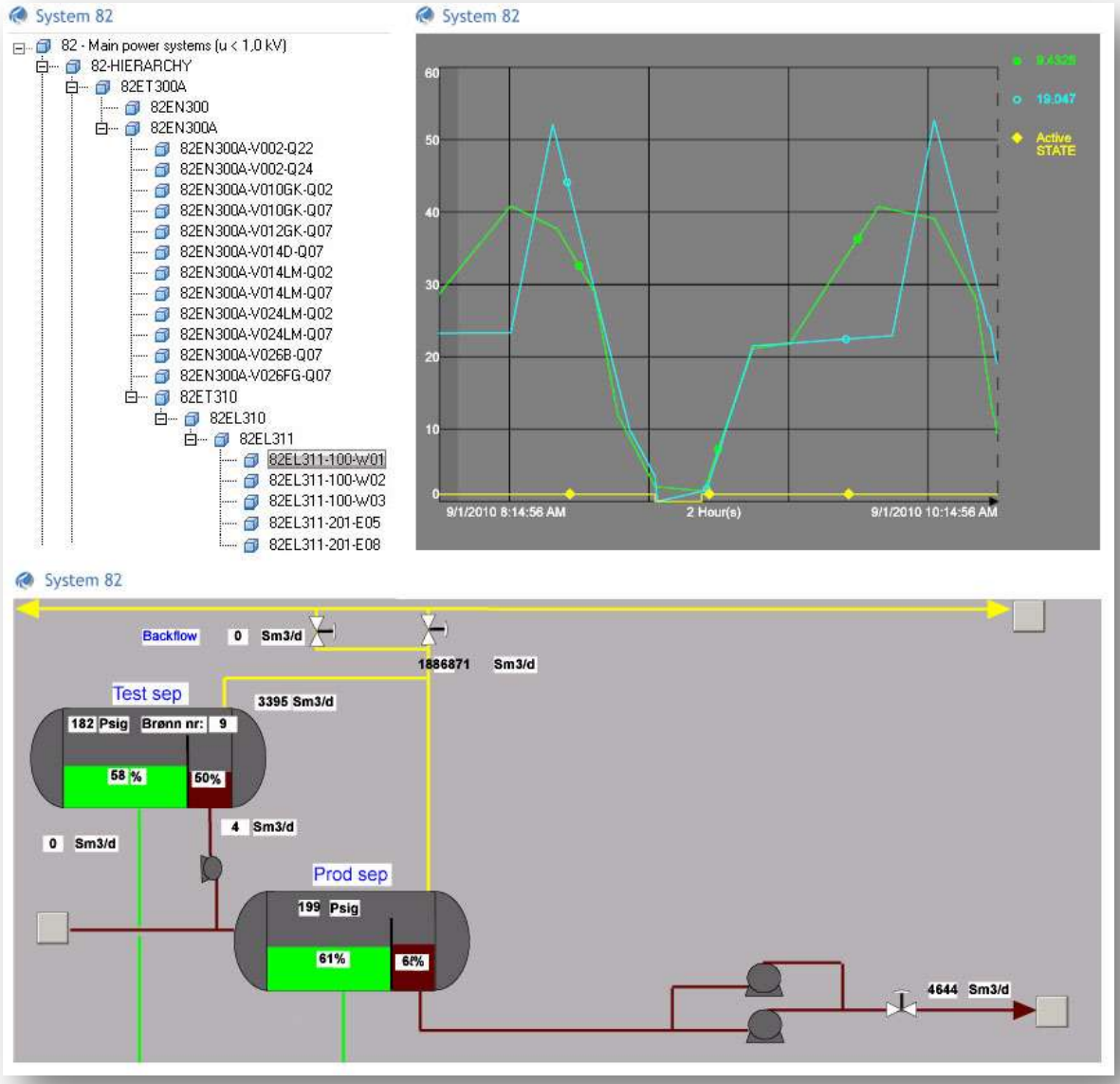
PI AF = Value for the Users



PI AF = Value for the Users



PI AF = Value for the Users



AF Technologies Used

Elements	Yes
Attributes	Yes
Models	Not yet
Categories	Yes, Element Categories
Templates	Yes, Element Templates
Enumeration Sets	Yes (no)
Tables and Table Lookup	Yes
PI Point Data Reference	Yes
Unit of Measure (UOM)	Not yet

Questions?

Thank you

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