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Challenging the collaboration issue in nuclear plant design

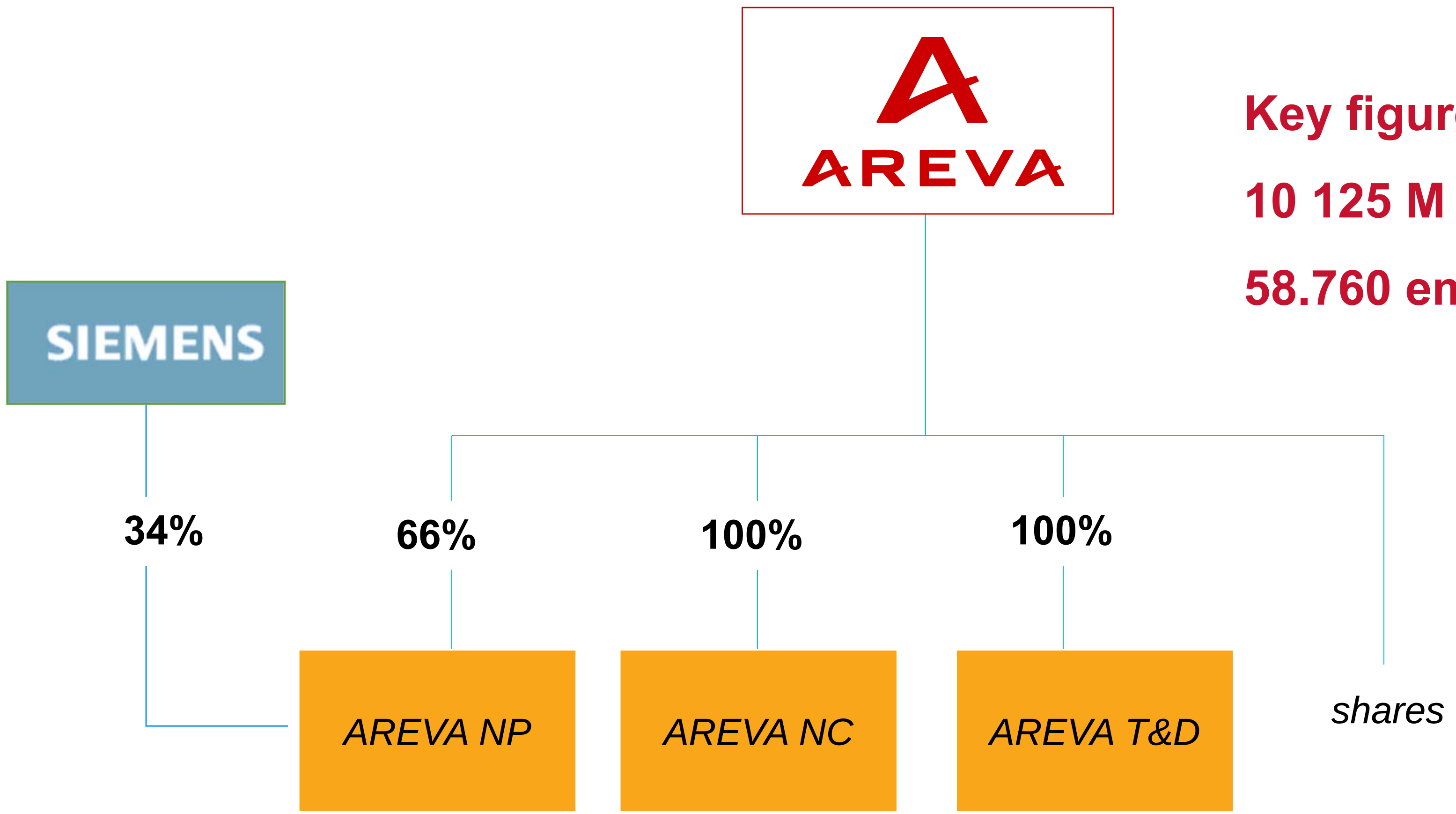
Frank-Peter Ritsche

Project Management Initiative / AREVA NP

PELC Conference

The Hague June 7, 2006

The AREVA group



Key figures (2005)

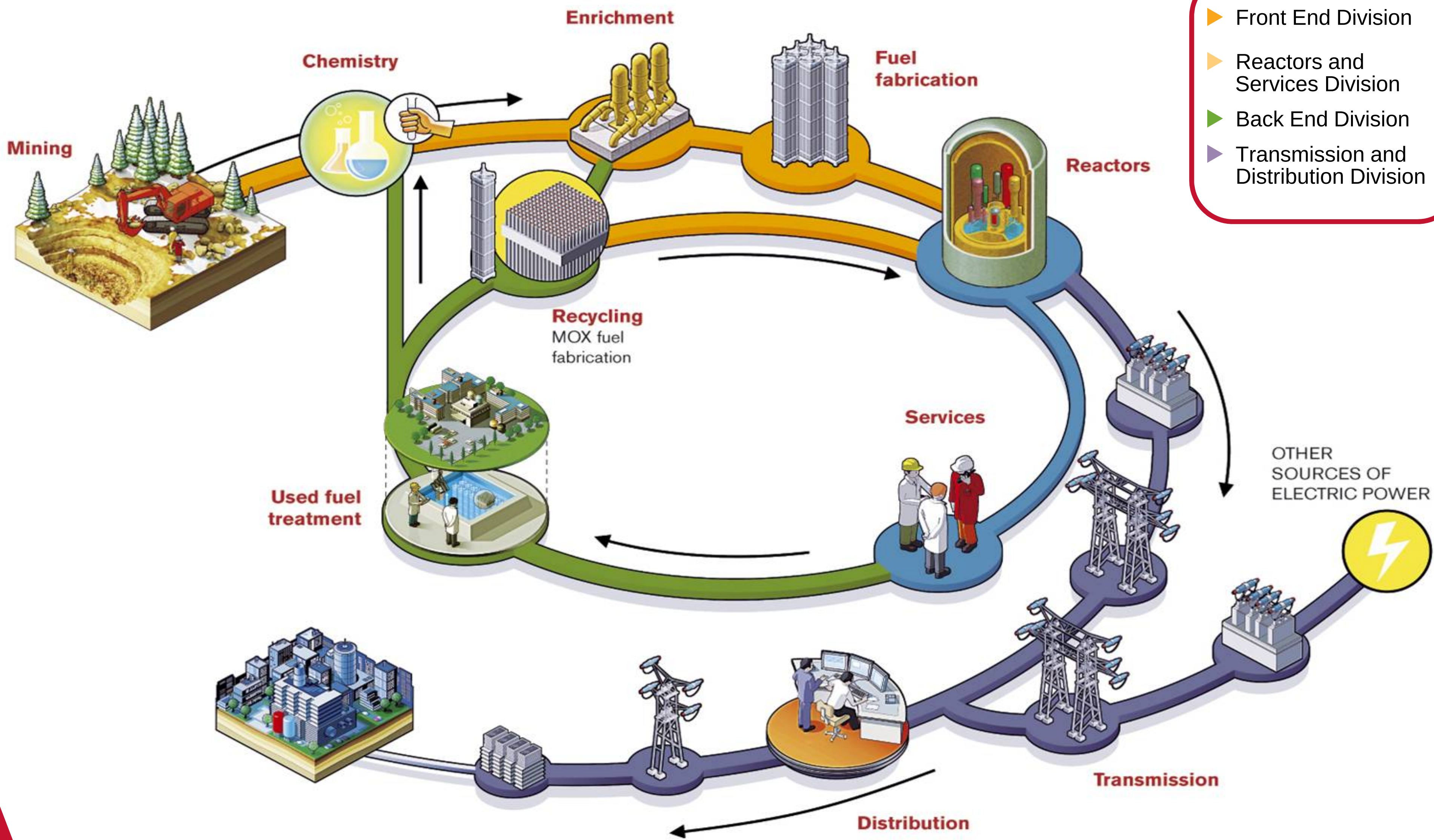
10 125 M EUR revenue

58.760 employees

AREVA is world leader in the energy business

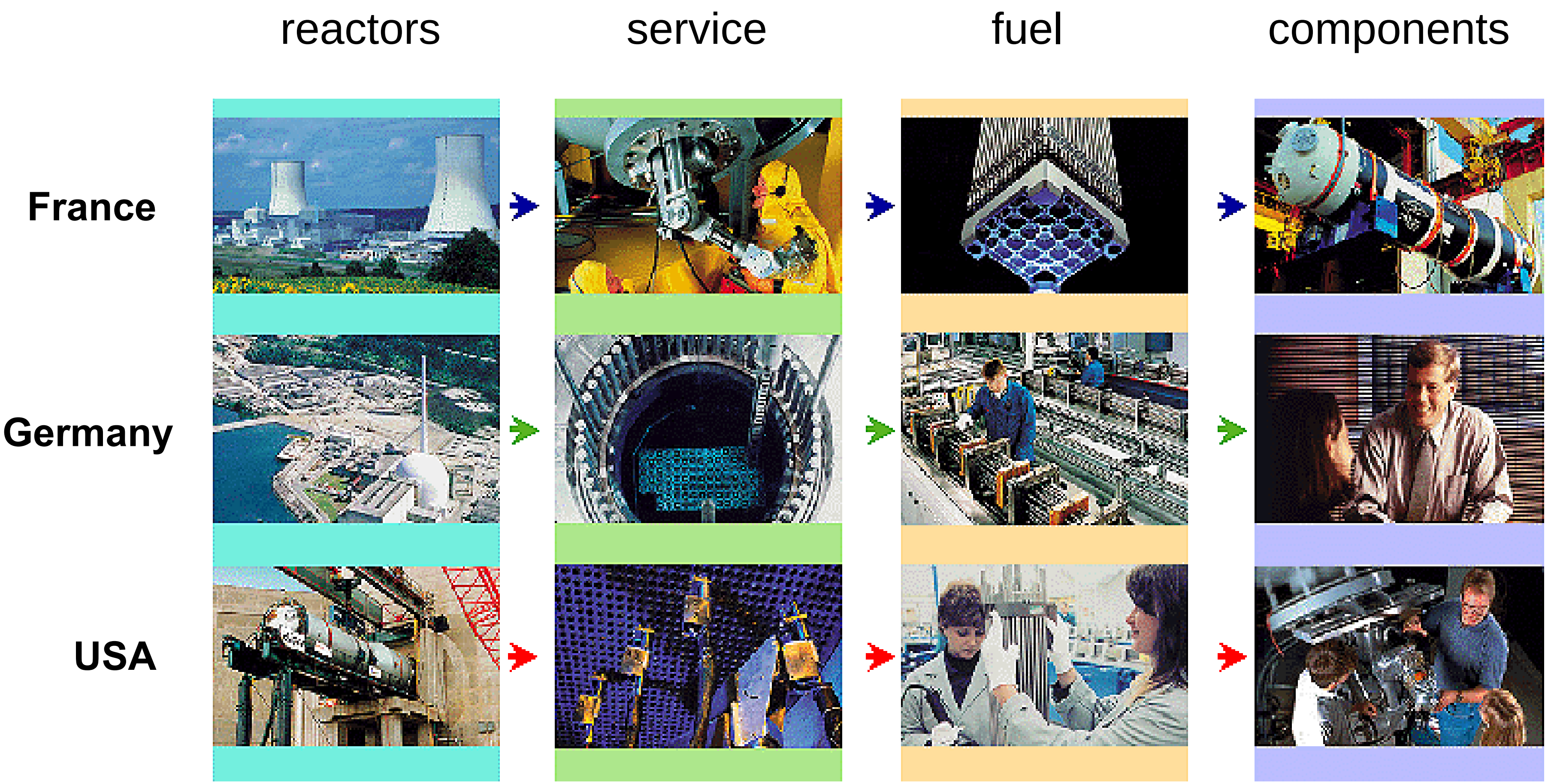
- ***N°1 in the entire nuclear cycle***
- ***N°3 in electricity transmission and distribution***

Energy: our core business



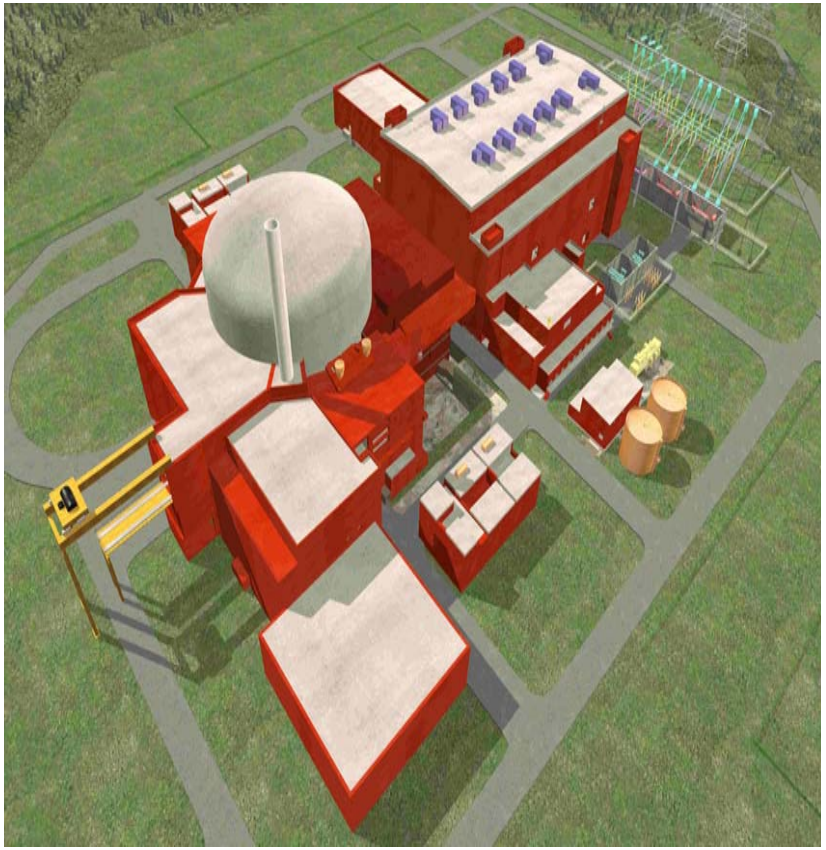
- Front End Division
- Reactors and Services Division
- Back End Division
- Transmission and Distribution Division

AREVA NP – international matrix organization



EPR: the first-built generation III+ reactor

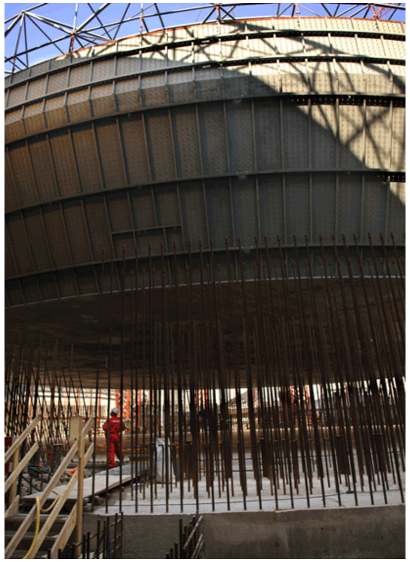
The EPR is an advanced evolutionary pressurized water reactor (PWR) designed by AREVA NP, an AREVA and Siemens company.



Electric Output:	1,600 MWe
Reactor Power:	4,300 to 4,500 MWt
Design Life:	60 years
Fuel Type:	Enriched (up to 5%) uranium and/ or mixed-oxide (MOX)

More information on: **www.areva-np.com**

The EPR in Europe



May 11, 2006: Installation of the 180 t bottom liner part

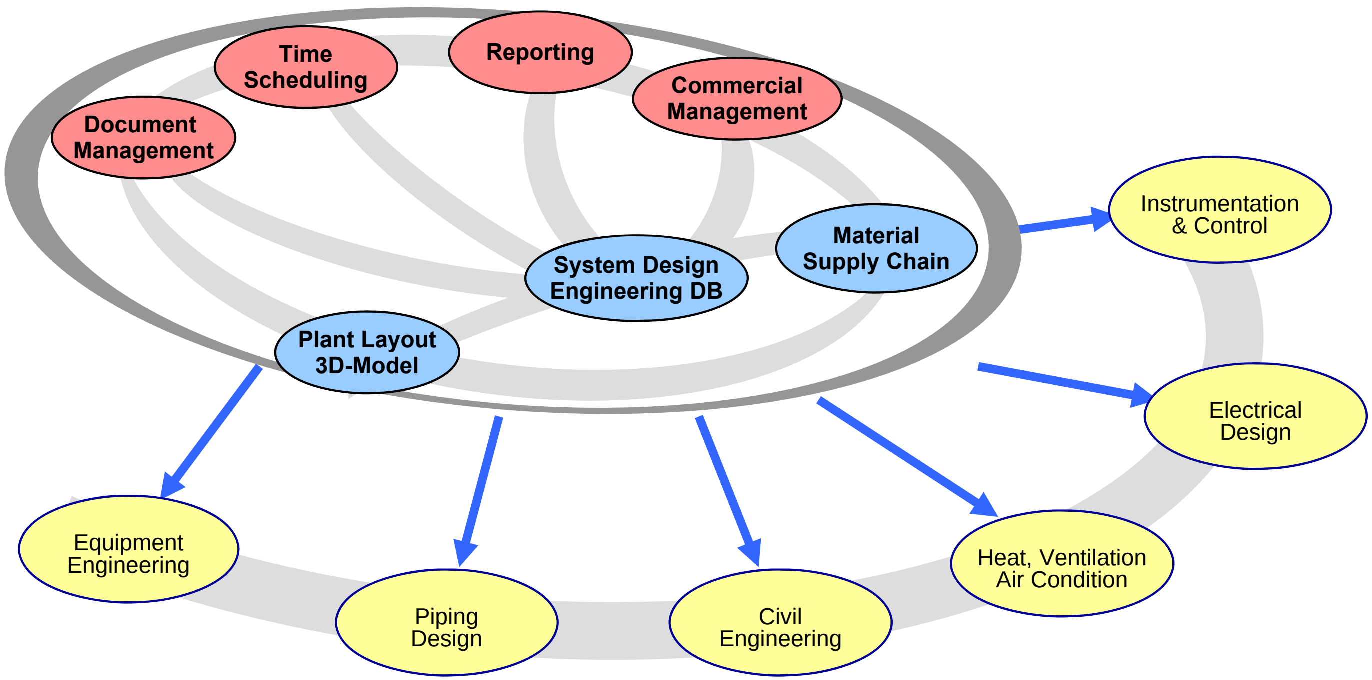
Olkiluoto 3 (Finland)

First concrete: 2005
Operation: 2009

Flamanville 3 (France)

First concrete: 2007
Operation: 2012

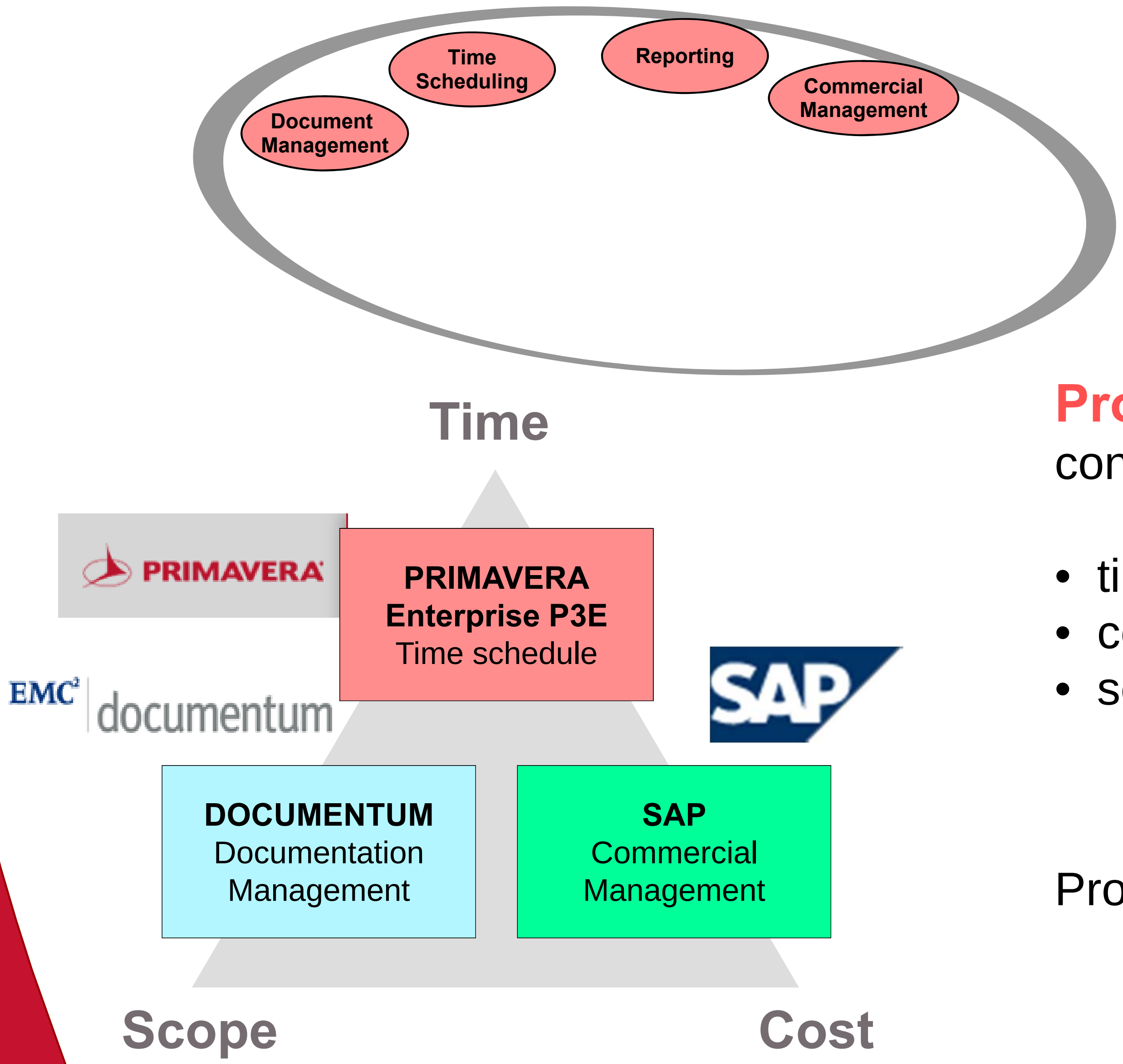
Information Management in New Plants Projects



Information Management in a project comprises

- Project Management
- Design Integration
- Engineering

Information Management in New Plants Projects

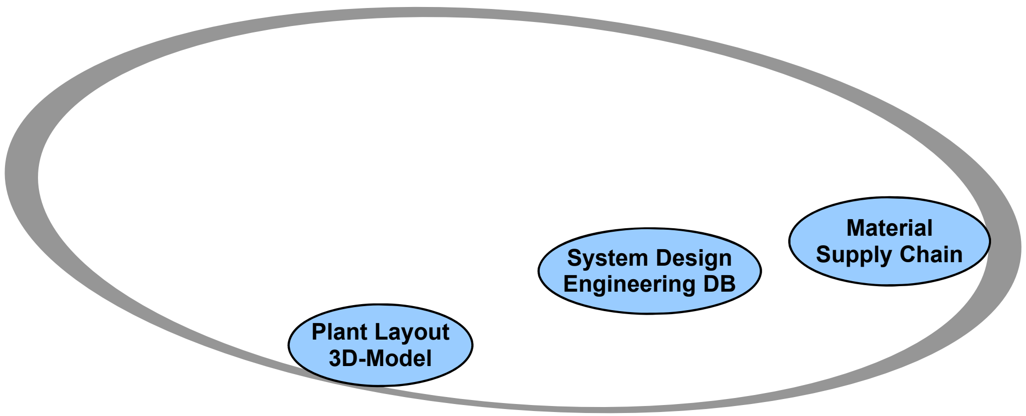


Project Management
considers the integration of

- time & resource information
- commercial information and
- scope, which in engineering is
  - → documentation and
  - → data

Project reporting covers in addition
- → quality
- → risks

Information Management in New Plants Projects



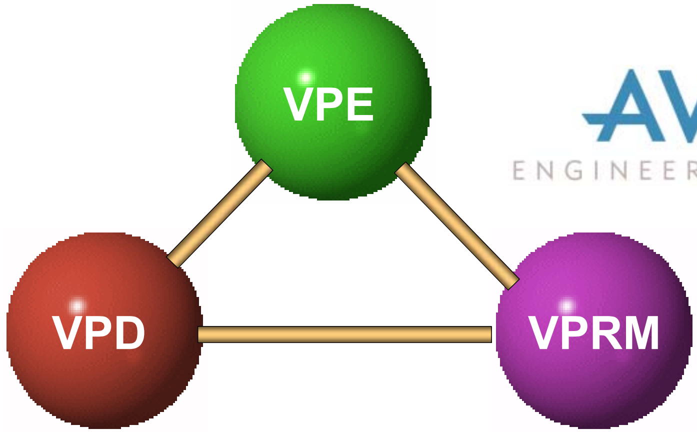
Vantage VPE
Systems Design database

Vantage VPD (PDMS)
3D Design

Vantage VPRM
Material Management

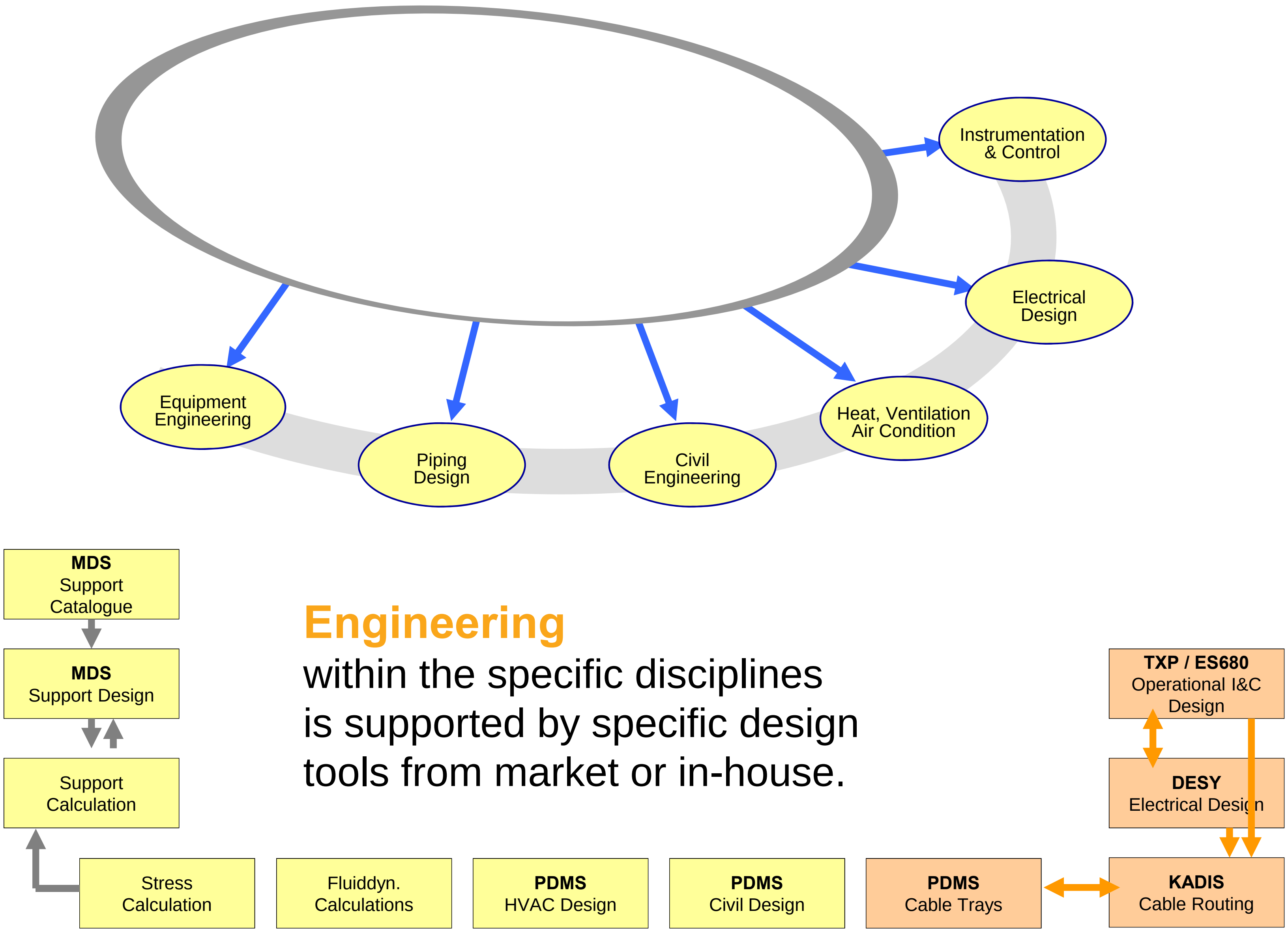
Design Integration

in AREVA NP is achieved within Aveva‘s VANTAGE suite of Engineering tools



AVEVA ENGINEERING/IT

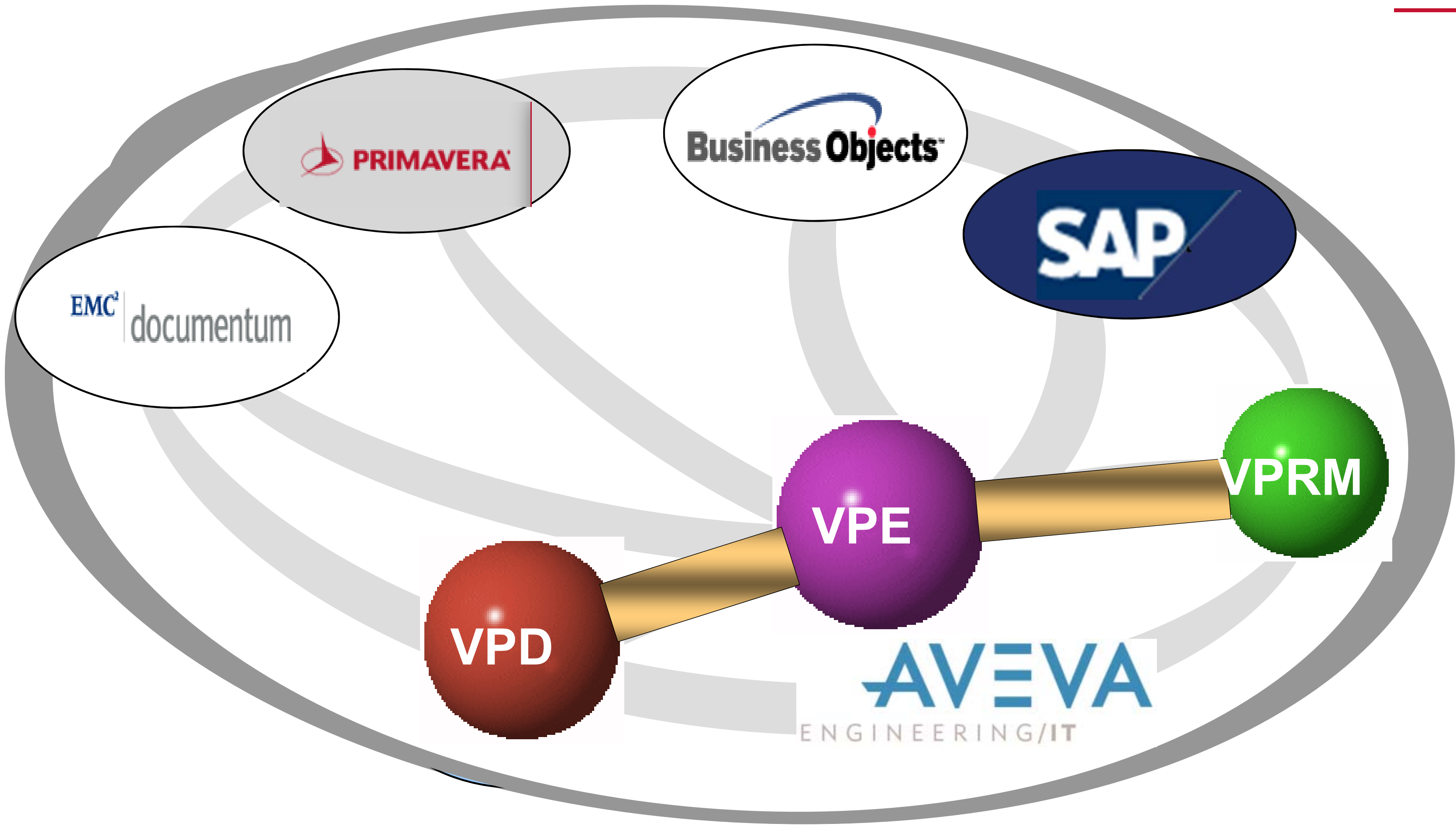
Information Management in New Plants Projects



Engineering
within the specific disciplines
is supported by specific design
tools from market or in-house.

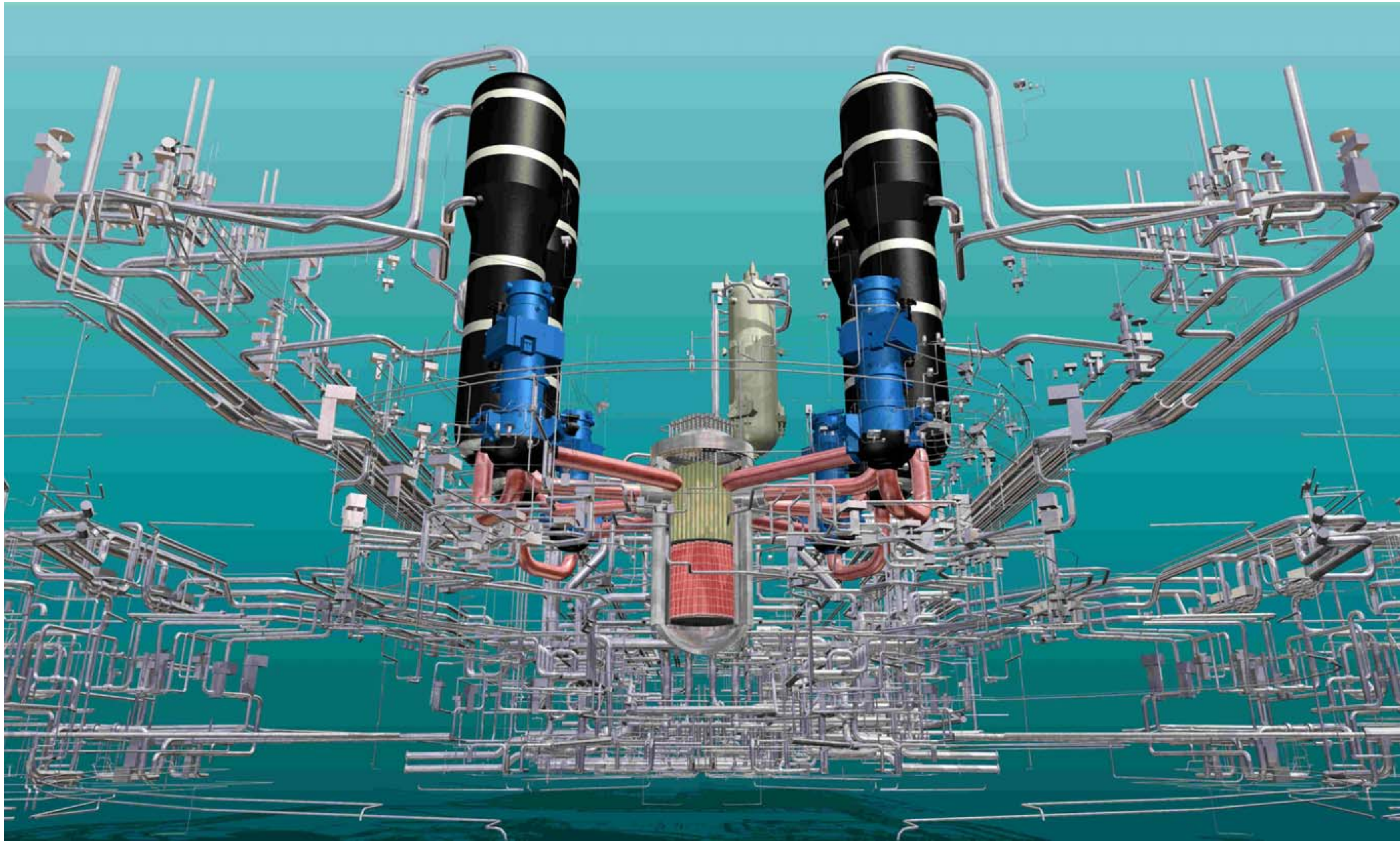
(examples)

AREVA NP Information Management System



Our partners are the world market leaders in their field

Engineering Information Technology for the EPR

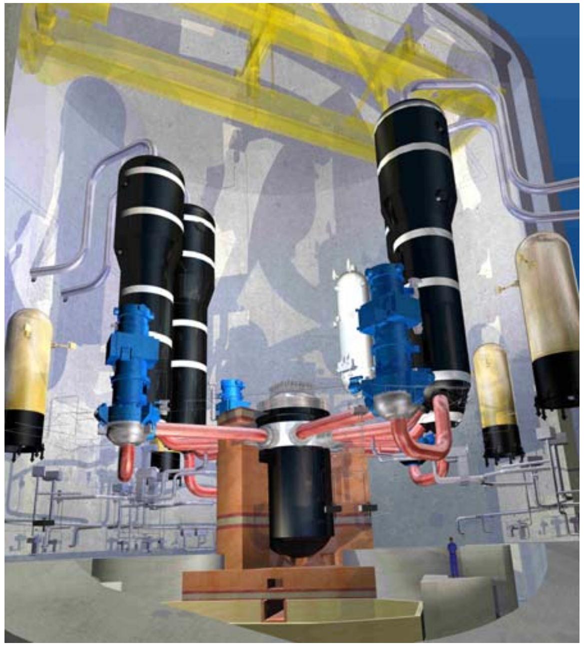


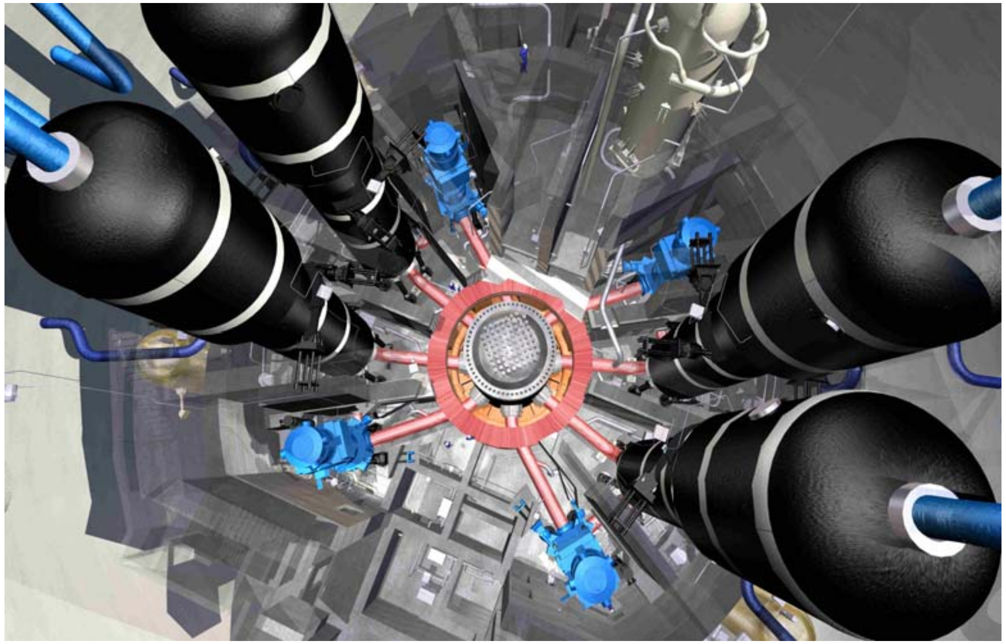
Today more than 200 Engineers in 5 different locations in France, Germany and Finland are designing simultaneously the EPR detailed plant layout in 3D

Engineering Information Technology for the EPR

AREVA NP is taking full advantage of the complete and fully integrated VANTAGE suite of Aveva‘s tools

- VPE P&ID and VPE Workbench for process design
- PDMS (VPD) for 3D plant layout
- VPRM for material management
- MDS for detailed support design
- Model Manager e.g. for interfacing VPE and VPD
- Global for synchronizing the 3D around the globe

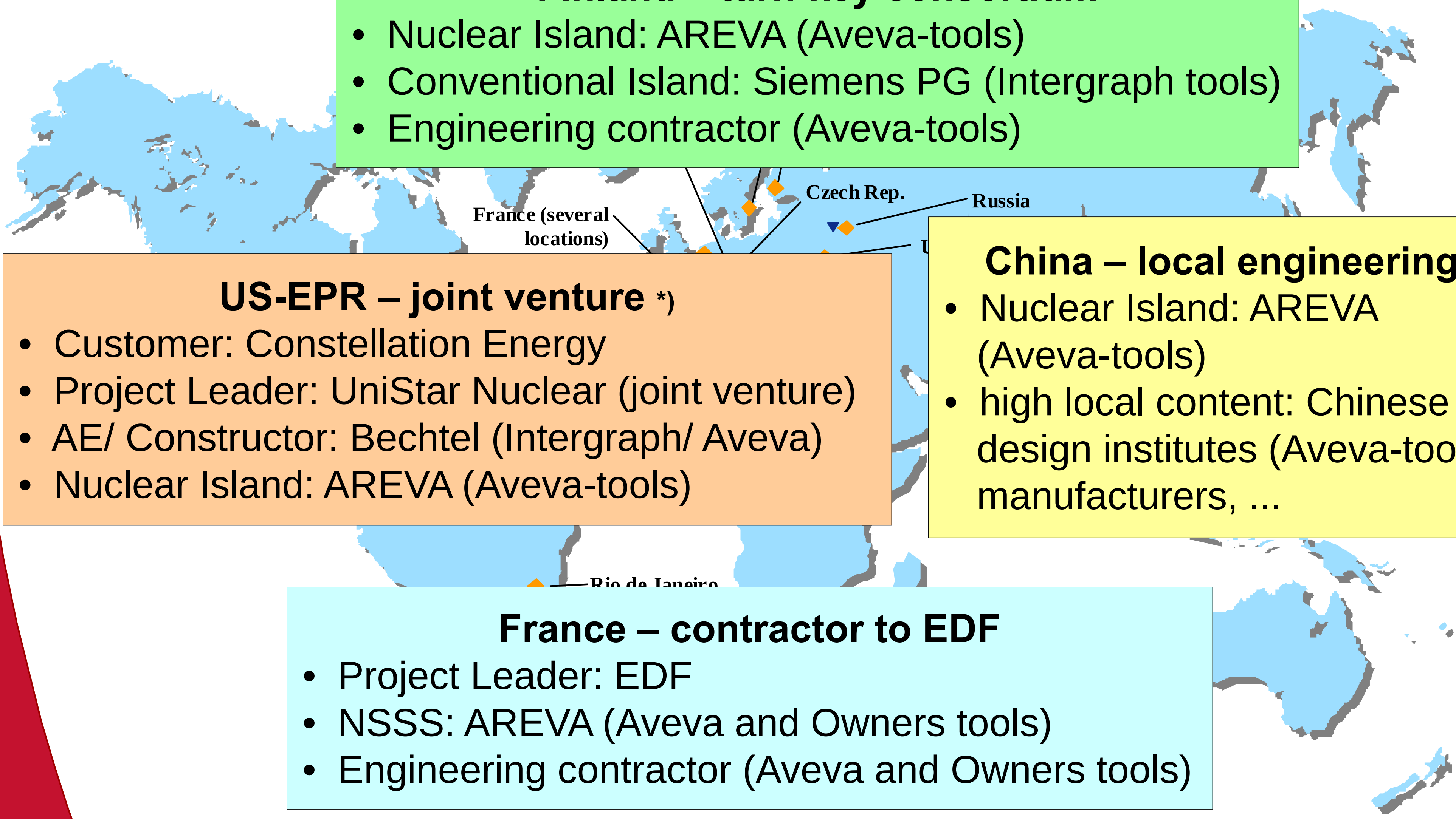




Collaboration issues in nuclear plant design

between tools	o Data management & configuration management between the modules of the IMS o Interfacing SAP, Primavera, Documentum, VPE, VPD, VPRM and design tools of specific disciplines
between partners & suppliers	o Data exchange between consortium partners, architect engineers, key engineering contractors o Data exchange between equipment suppliers (component data, operation & maintenance)
between projects	o Modularization of plant and Engineering „re-use“ o Information/ Configuration Management across plants
between EPC and O/O	o Handover of „virtual plant“ into Owners system o Consider Owner/ Operators need for operation and maintenance o Consider plant life time (60 years) data maintainability

Collaboration with Partners - Examples



Finland – turn-key consortium
- Nuclear Island: AREVA (Aveva-tools)
- Conventional Island: Siemens PG (Intergraph tools)
- Engineering contractor (Aveva-tools)

US-EPR – joint venture *)
- Customer: Constellation Energy
- Project Leader: UniStar Nuclear (joint venture)
- AE/ Constructor: Bechtel (Intergraph/ Aveva)
- Nuclear Island: AREVA (Aveva-tools)

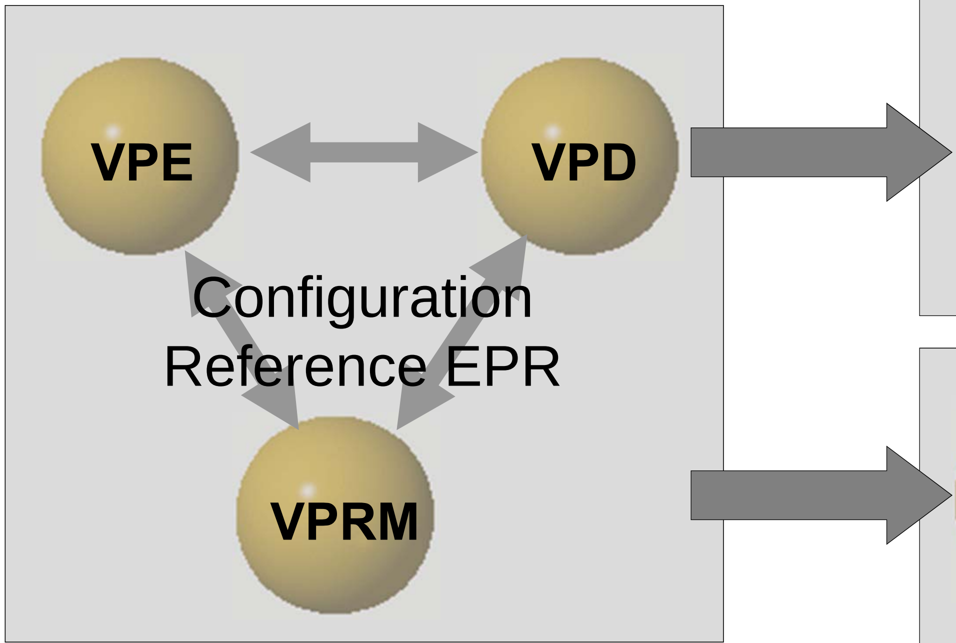
China – local engineering **)
- Nuclear Island: AREVA (Aveva-tools)
- high local content: Chinese design institutes (Aveva-tools), manufacturers, ...

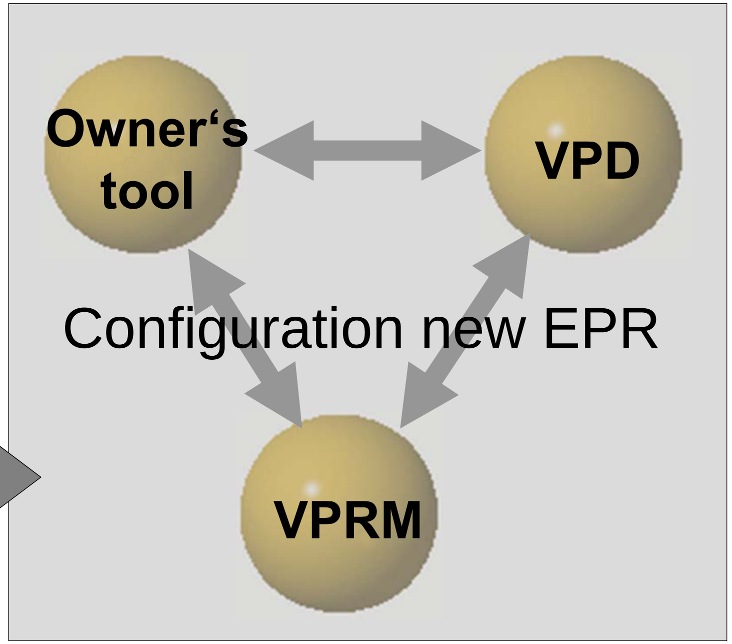
France – contractor to EDF
- Project Leader: EDF
- NSSS: AREVA (Aveva and Owners tools)
- Engineering contractor (Aveva and Owners tools)

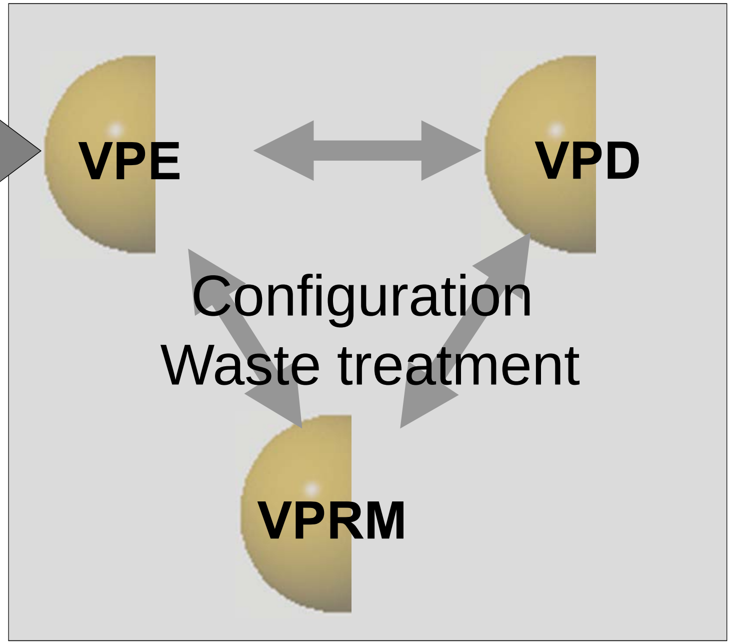
Note *) – UniStar Nuclear has selected Bechtel as the AE-Constructor for the first four units of the U.S. EPR fleet
Note **) – AREVA NP is currently negotiating for four « Generation 3 » reactors in China

Engineering Re-use

Re-use of complete original configuration for new project – <u>Challenge</u>: integration/ replacement of a different tool



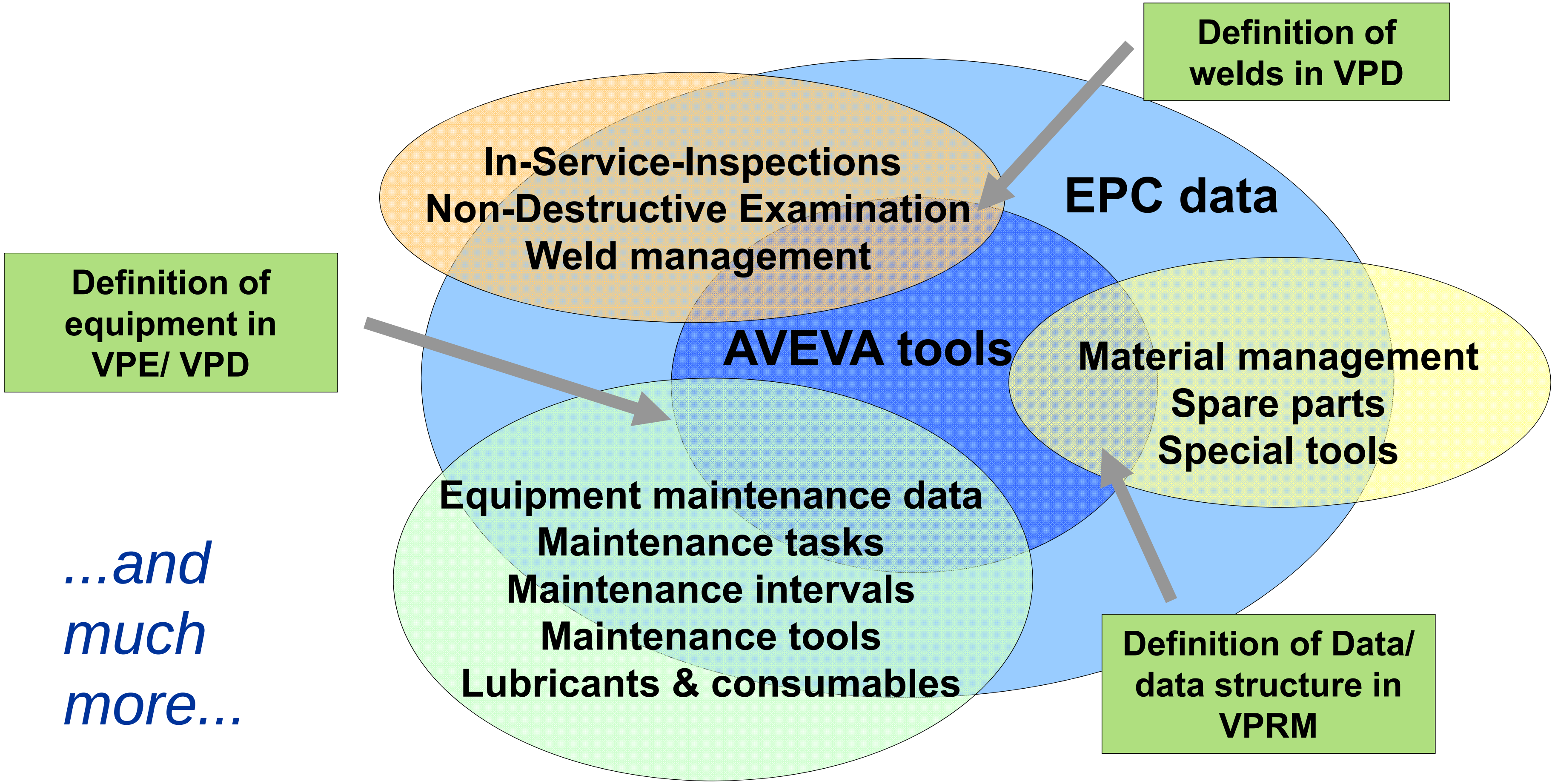




Modularization: Re-use of a part of the original configuration for new project – <u>Challenge</u>: structure of modularization to be considered in early design

Operation & Maintenance data

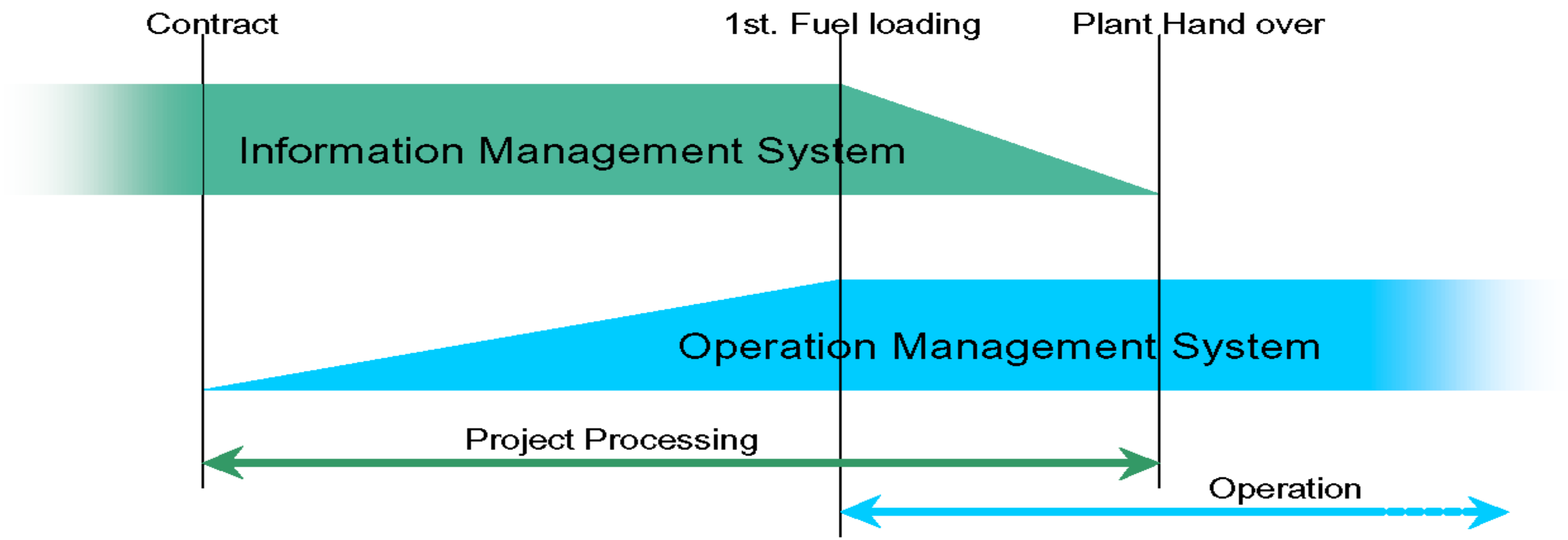
Which information needs the Owner to operate & maintain the plant?



...and much more...

→ *Involvement of equipment suppliers strongly required!*

Information and Operation Management

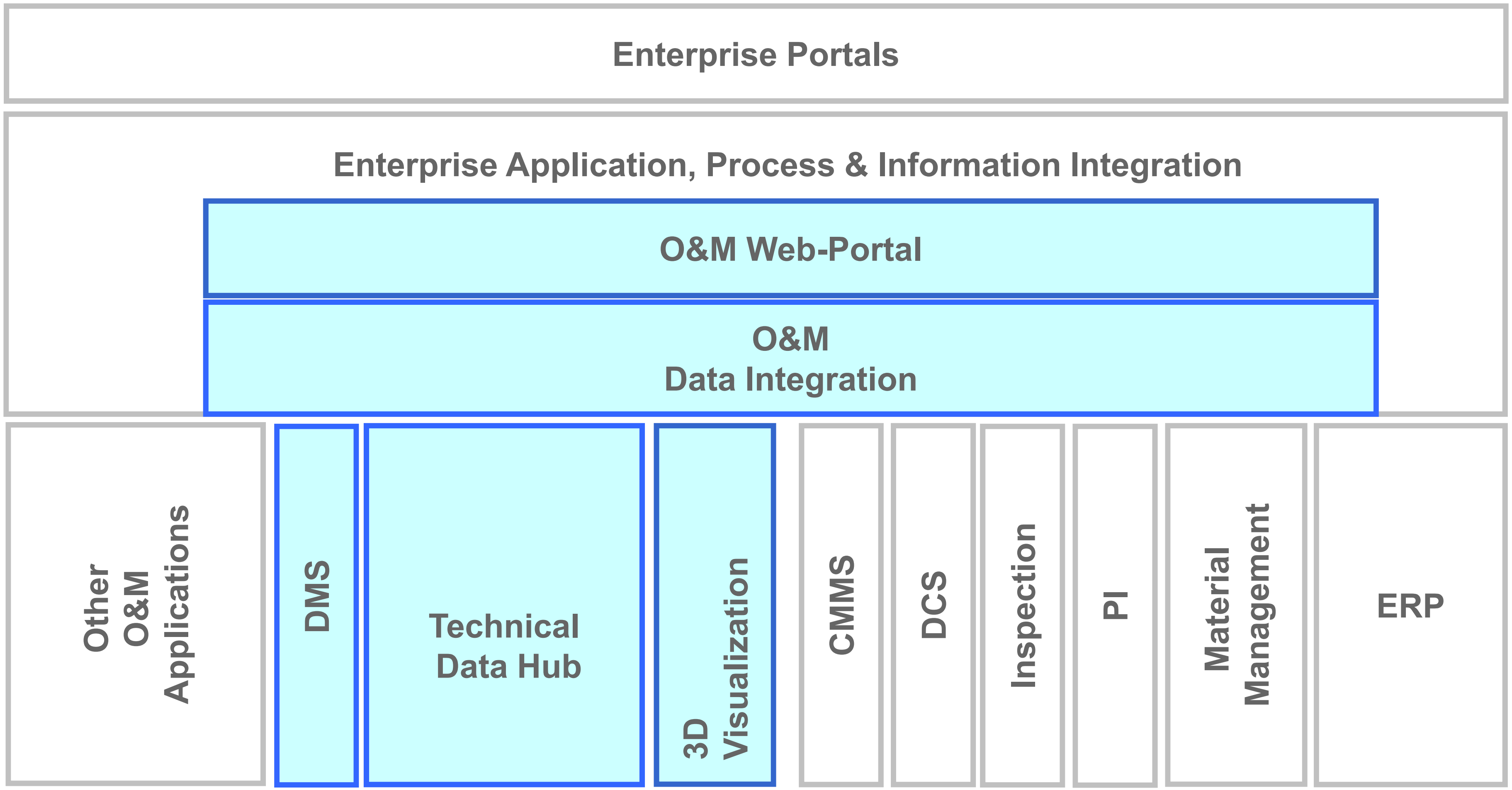


Since start of the EPR-project on Olkiluoto 3 site, AREVA NP implemented a fully integrated „**Information Management System**“ for Engineering and Project Management.

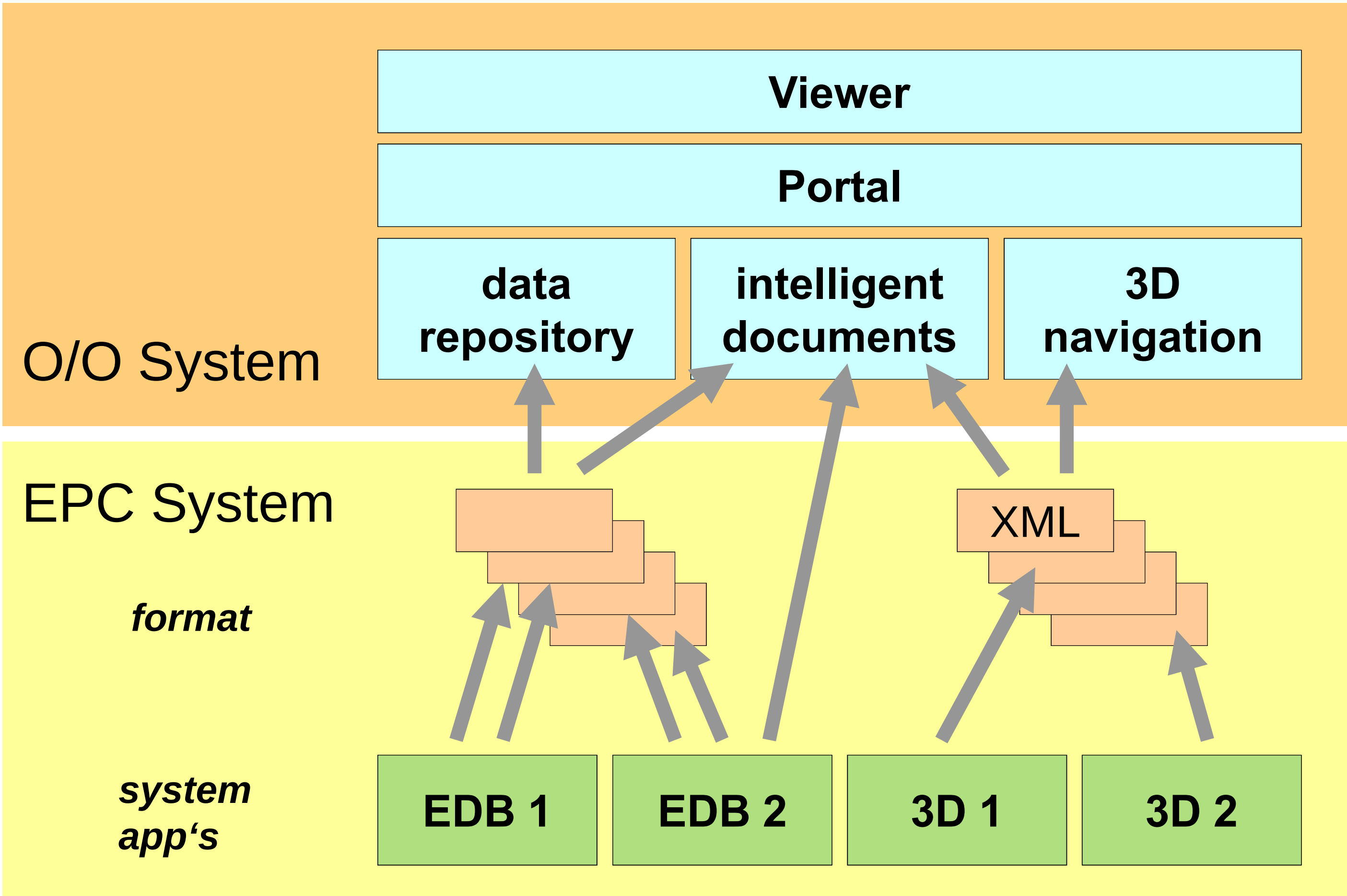
The information generated by AREVA NP is being handed over to the Owner/ Operator in a continous process.

Data Handover to the Owner/ Operator

Life Cycle Asset Management Solution – An Owners’ system

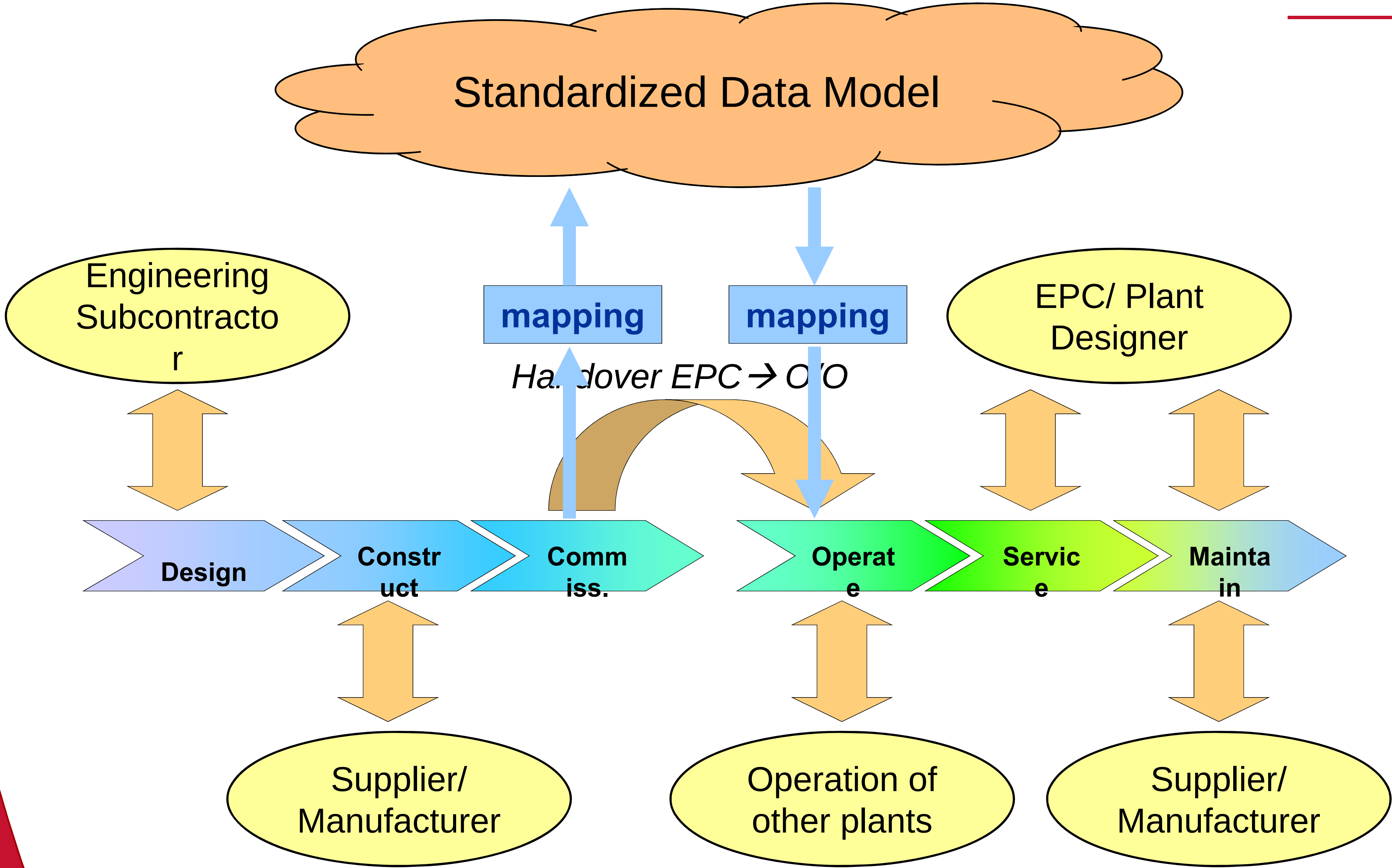


Data Handover to the Owner/ Operator



Only data handover in a structured data model of neutral format provides maintainability of information beyond the life time of specific system applications over 60 years of plant operation

Standardization of Data Handover



Plants Data Life Cycle Management

A challenge for Operators and Plant Designers in Nuclear Power:

- Evolute ISO 15926 standard to the needs of the nuclear power industry
- Establish ISO 15926 as standard for data handover
- Enforce IT-solution providers to provide tools conform with ISO 15926
- Enforce IT-solution providers to allow easy changes to the data without the need to implement the full original tool

The benefit for the Owners & Operators:

- Limit Operators‘ costs for software licenses/ updates & staff qualification
- Ensure life-time maintainability of information independend from IT-tools
- Facilitate and accelerate data handover processes

Thank you!

www.areva.com

Contact:

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Project Management Initiative

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You do not have any questions, do you?

Time	Activity	Activity
07.00 - 08.30 hr	**Registration**	**Reception desk**
08.45 - 09.00 hr	**Welcome, opening of conference** — **Paul van Exel, Director USPI**	**Oceanië room and Foyer**
09.00 - 09.15 hr	**Key note address** — **Henk Koese, VP Projects, ABB Lummus Global**	
	Theme 1: Procurement workshop — **Room Europe 1** Chair: Arnoud den Hoedt, Mg Marketing & Sales, ABB Process Automation Facilitator: Dave Wallis, European representative PIDX	**Theme 2: Design & Engineering workshop** — **Room Europe 2** Chair: Gary Magill, Foster Wheeler, UK Facilitator: Ko des Bouvrie, Technical Director, Cost Engineering Consultancy
09.15 - 10.30 hr	T1 **Industry views** ♦ Roadmap compressor data management Bernd Schmallhorst, Information Officer, Siemens Power Generation ♦ Procurement in Bayer Technology Services and PROLIST companies Günter Löffelmann, Head of Global Procurement, Bayer Technology Services, Germany	T2 **Industry views** ♦ Challenging the collaboration issue in nuclear plant design Frank Peter Ritsche, PMP, Project Mgt Initiative, Framatome ANP Germany ♦ Best practices and standards Akzo Nobel Engineering Henk Boerboom, Project Mgt Leader, AkzoNobel
10.30 - 11.00 hr	Break	
11.00 - 12.30 hr	T1 **Industry / Solution provider views** ♦ Usage eCl@ss in process industry Raymond Betz, Convener ePDC, Representative eCl@ss ♦ Usage of OTD by NATO and quality requirements Senior representative of ECCMA Brainstorm and synthesis	T2 **Industry / Solution provider views** ♦ Integrated Cost Estimating Fluor , Representative tba ♦ Engineering tools for growth JR Dubbeldam, CEO, The Badger Company Brainstorm and synthesis
12.30 - 13.30 hr	Lunch	
	Theme 3: Ops & Maintenance workshop — **Room Europe 1** Chair: Edwin Stötefalk, Lyondell, Mgr European Support Manufacturing Facilitator: Matti Paljakka, VTT Systems Finland	**Theme 4: Supply chain integration workshop** — **Room Europe 2** Chair: Frank-Peter Ritsche, Framatome ANP Germany Facilitator: Bart Bink, Consultant, TLO
13.30 - 14.45 hr	T3 **Industry views** ♦ As-Built documentation: experience and developments BASF Herman Baets, Manager Site Projects, BASF Antwerpen ♦ Platform Ops & Maint, Baker Energy Glen Makinson, Manager Technical Information, Baker Energy	T4 **Industry views** ♦ Dupont Strategy life cycle data, alignment EU/USA Jehu Burton, Project Manager, Dupont USA ♦ Data Integration in Pulp industry Timo Syrjanen, Development Manager, Poyry, Finland
14.45 - 15.15 hr	Break	
15.15 - 16.45 hr	T3 **Industry / Solution provider views** ♦ Experiences with data base driven 2D and 3D schematics Rob de Leeuw, Lyondell, Sr Analyst Enterprise Information Mgt ♦ Master Data Mgt in Mullti-Application Environment" Fred Vroomen, Business Process Expert for Maintenance, DSM Brainstorm and synthesis	T4 **Industry / Solution provider views** ♦ Data integration at Bechtel Robin Benjamins, Information Systems & Technology, Bechtel, USA ♦ Solutions for Integration Reserved for views Solution providers Brainstorm and synthesis
16.45 - 17.00 hr	**Summaries and PELC Award** — **Henk Koese, VP Projects, ABB Lummus Global** **Paul van Exel, Director USPI**	
17.00 - 18.00 hr	**Drinks, get together**	