Effective planning and engagement: mitigating construction risk of the UK's first EPR™

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The value of experience: 4 EPR™ Reactor Units Under Construction

Olkiluoto 3

Taishan 1&2

Flamanville 3

The World's First Advanced Fleet to be deployed

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EPR™ projects overview

	OL3 (Finland)	FA3 (France)	Taishan 1&2 (China)
Net electric output	1 600 MWe	1 630 MWe	1 660 MWe per unit
AREVA scope	Consortium leader for full EPC NI EPC	NSSS + I&C	NI EP + I&C
Project progress on AREVA scope*	83%**	65%	84%
Project Status	Flooding of cooling water structures Power connection between the national grid and OL3 site	Heavy components support devices installed Flooding of the water intake	Dome lifting done (U1 & U2) Heavy components installed, primary circuit welded

* as of December 30, 2012

** scope of the AREVA led consortium

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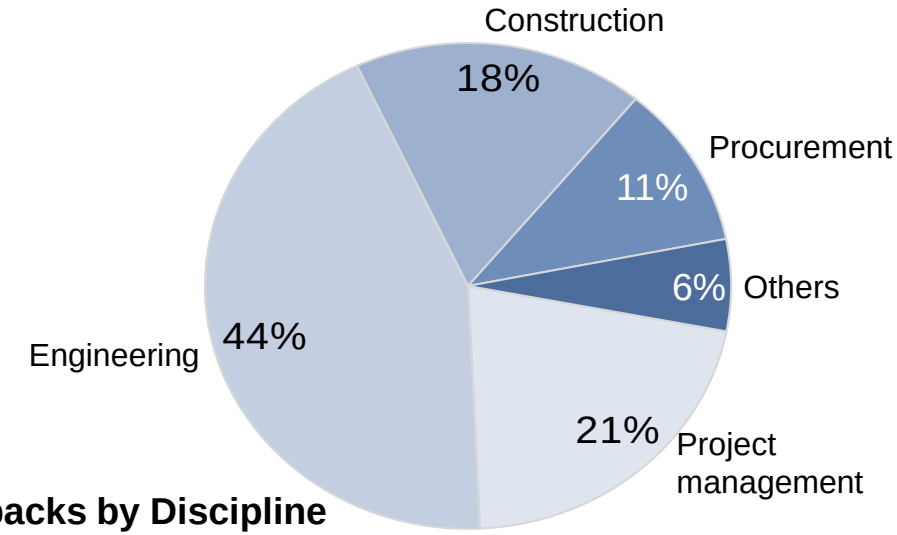
The value of Experience: Knowledge management
A mature field experience consolidation process

- **A systematic process…**
  - **There are more than 1700 Experience feedbacks in the data base coming from current projects and our work on currently operating plants**
- **… well established in the company:**
  - **In 2012 alone, around 1 Experience feedback per day has been captured**
- **This unique project delivery experience has allowed AREVA to improve on all aspects of project execution**
  - **Project management and organization**
  - **Engineering**
  - **Procurement**
  - **Construction**



Experience feedbacks by Discipline

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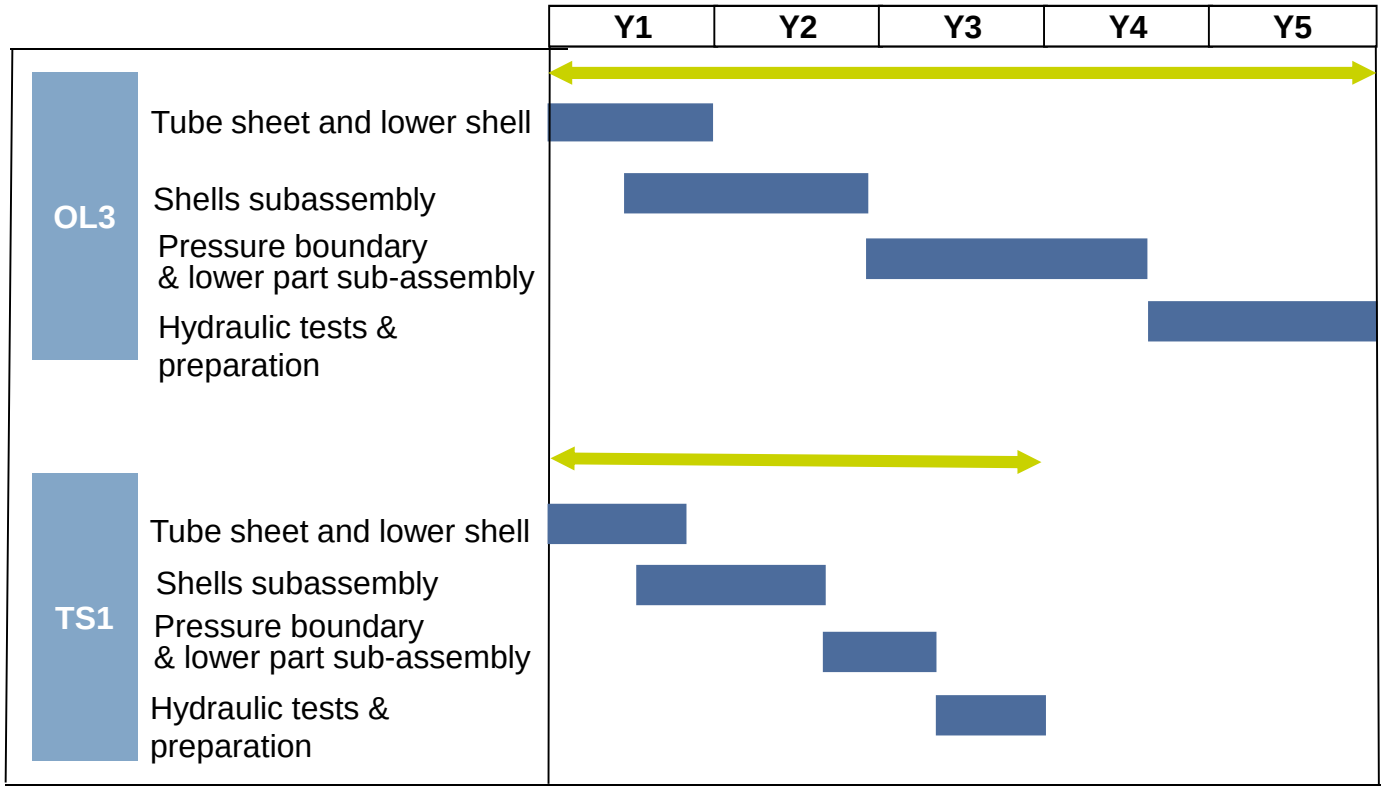
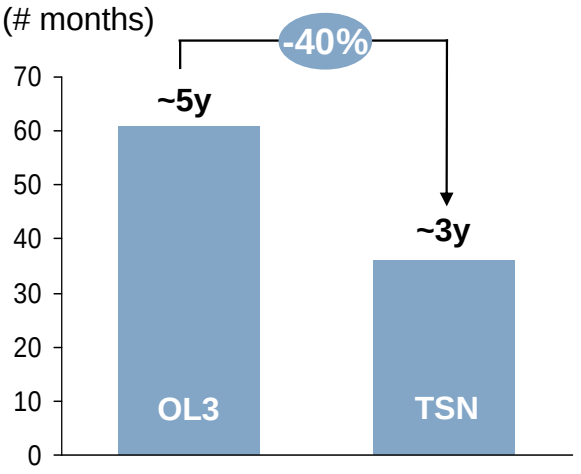
The Value of Experience: Supply chain
Manufacturing of heavy components





Apr '12

First two steam generators delivered on Taishan site

Source : AREVA, average of the four Steam Generators for each unit

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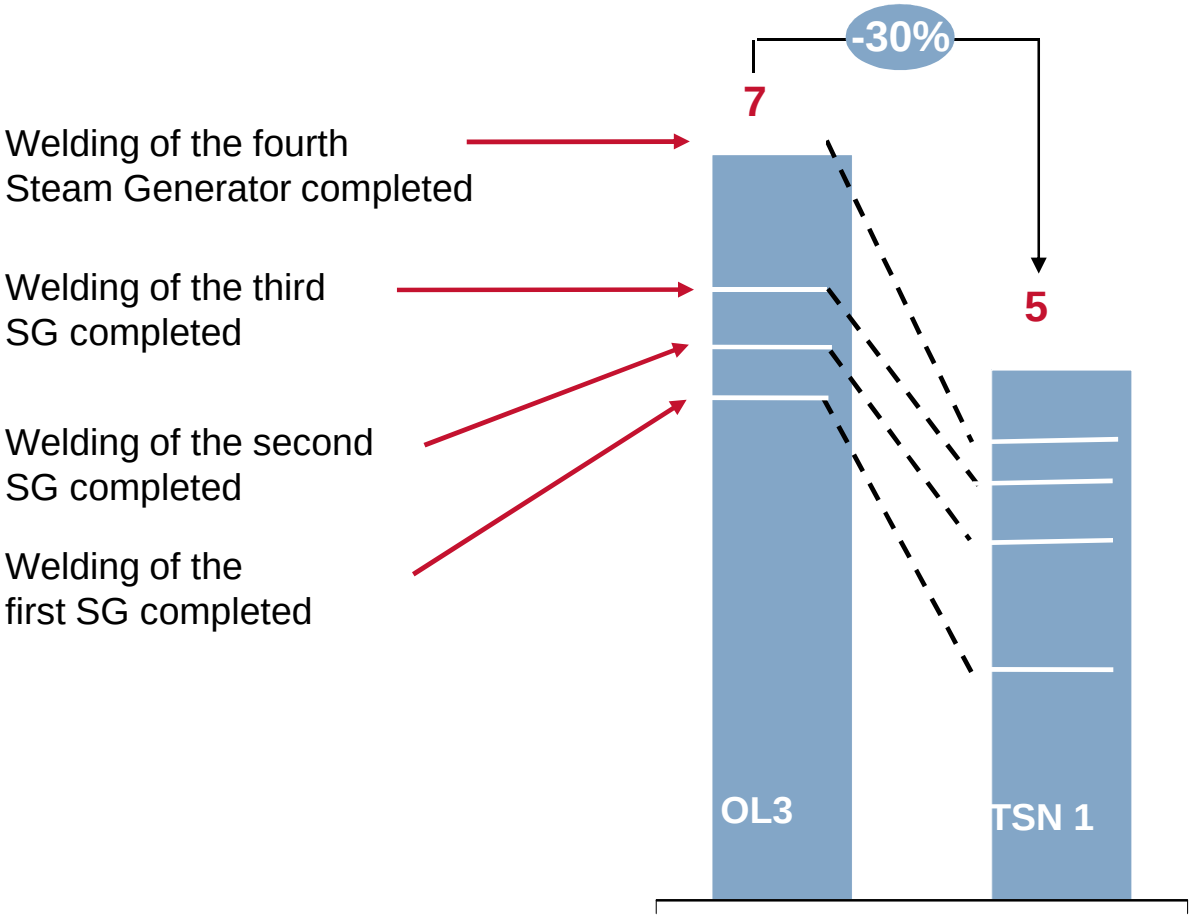
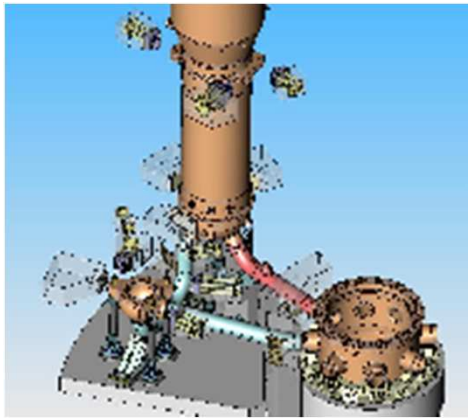
The Value of Experience: Installation
Welding of primary loop

Welding duration (# months)





Welding of SG1, Taishan

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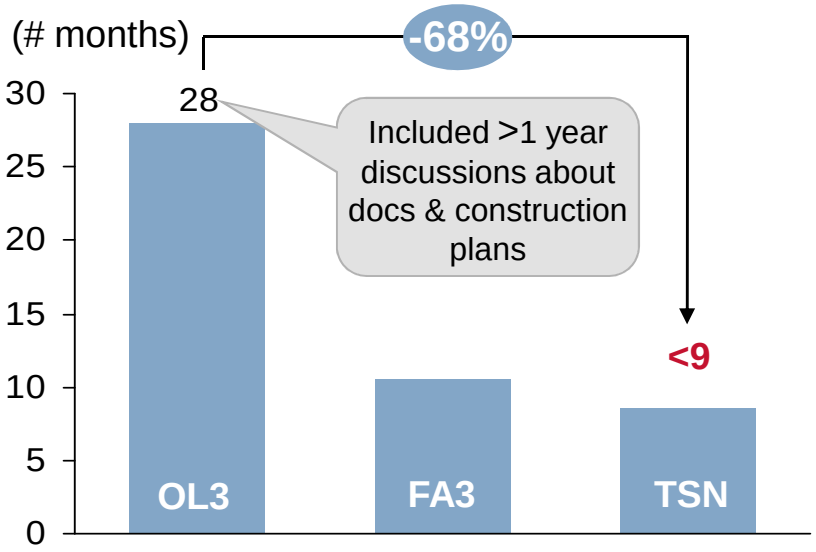
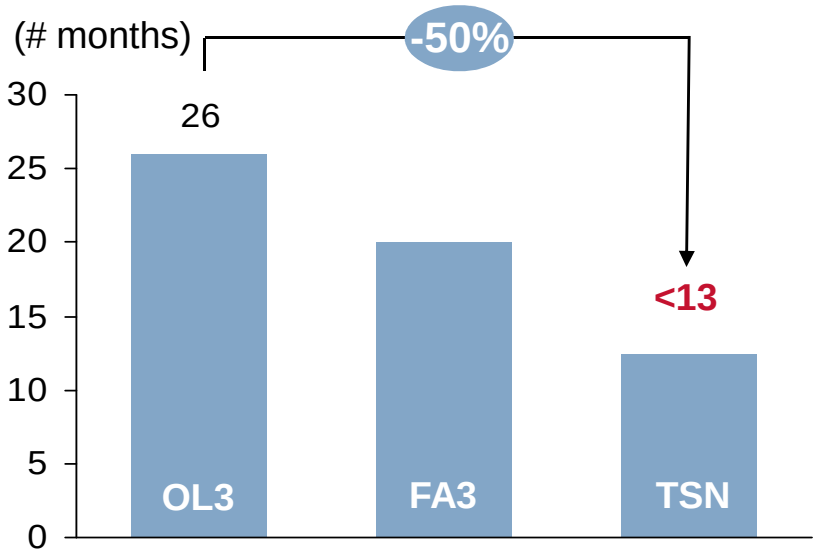
The value of experience: Procurement
Illustration: Core catcher

Delivery time core catcher protection layer[1]



Delivery time core catcher cooling structure[1]



1- Delivery time: from contract to delivery

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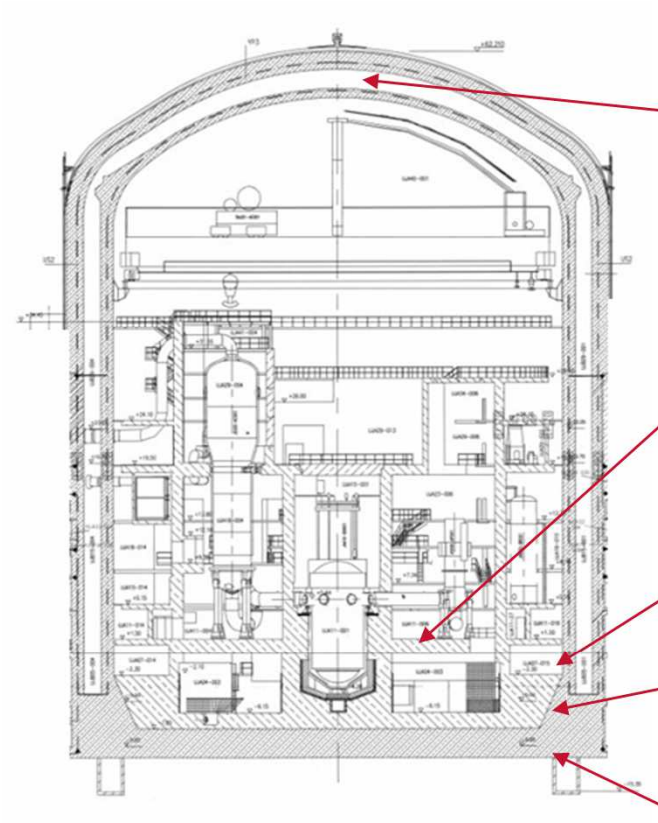
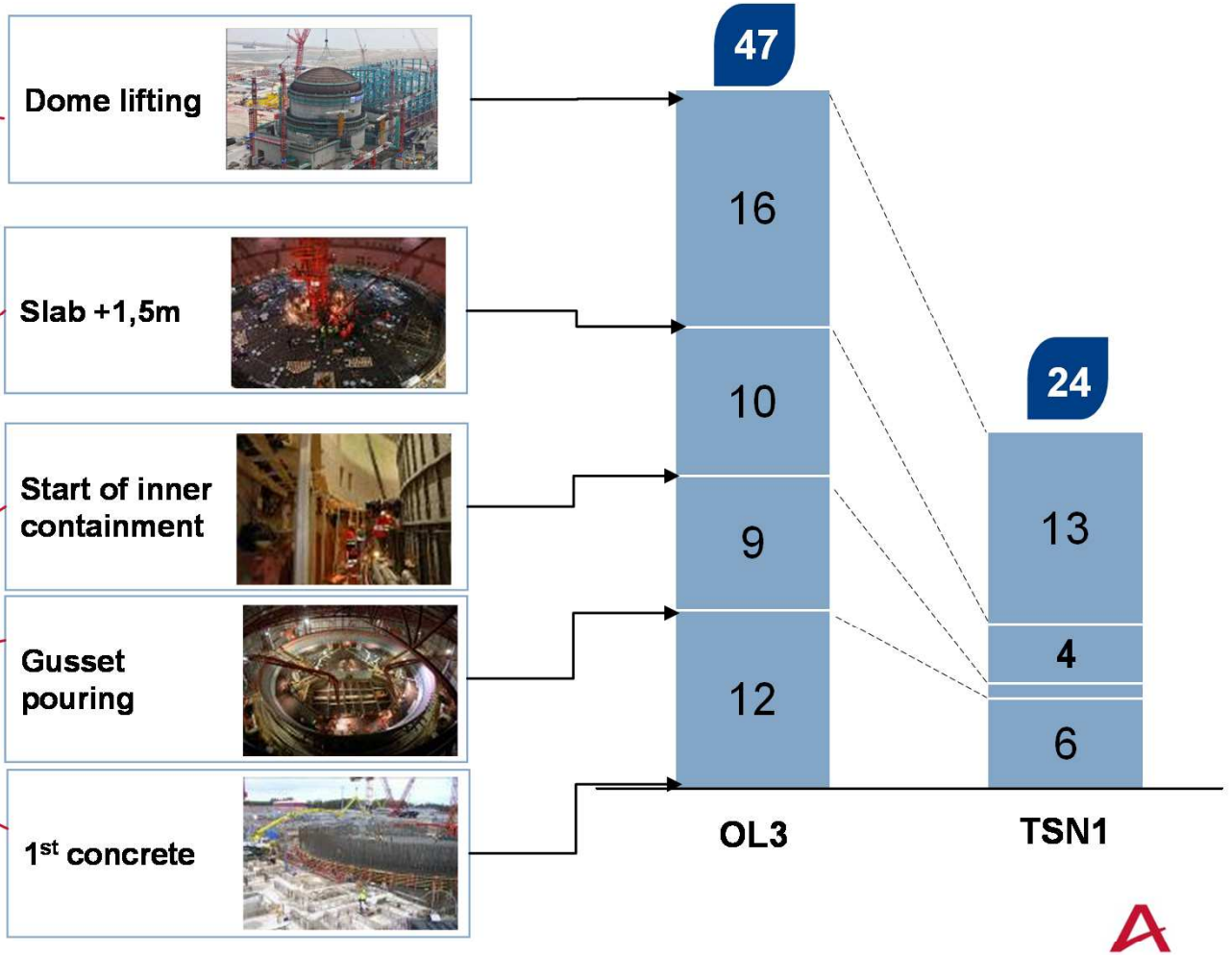
The value of experience: Construction

Illustration, from OL3 to TSN: first main milestones

Construction duration (# months)





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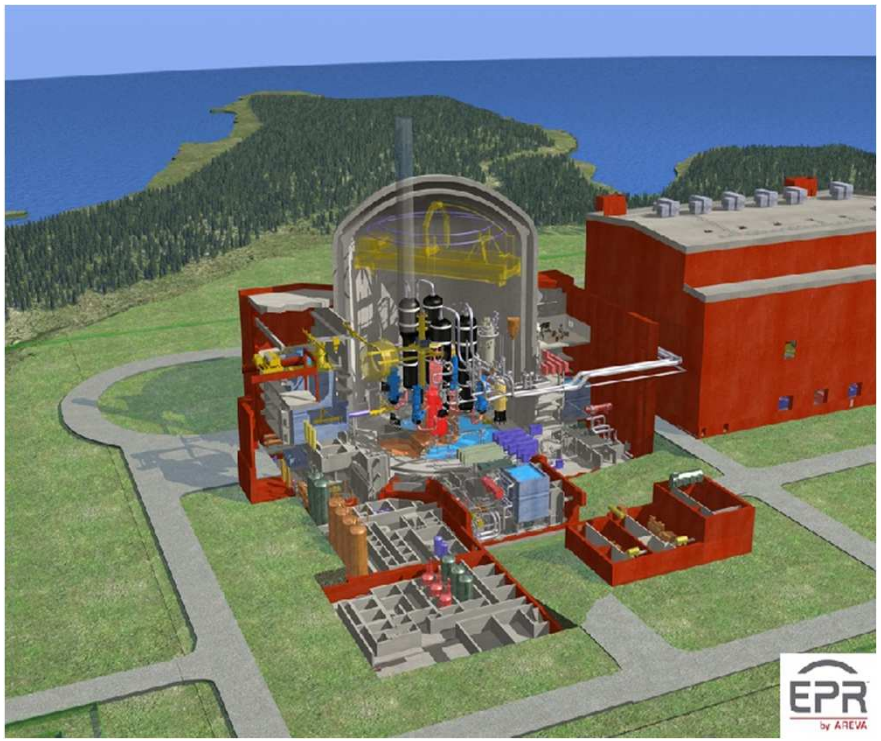
EPR™ design: the impact of the GDA process

- **13th December 2012:**
  - **Design Acceptance Confirmation by ONR**
  - **Statement of Design Acceptability by Environment Agency for the UK EPR™**
- **EDF/NNB Genco /AREVA and contractors as a joint Requesting Party**
  - **66 months of teamwork**
  - **56 000 days of engineering analysis & technical justification**



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EPR™ design: the impact of the GDA process

- **The UK EPR™ GDA Design Reference started from the FA3 (2008) design freeze and integrates 82 Regulator approved design changes**
  - **33% of the changes are based on FA3 design changes**
  - **67% are specific UK changes mainly related to:**
    - **Classification upgrades**
    - **Fukushima enhancements**
    - **C&I**
    - **System Design & Fault Studies enhancements**

- **≈ 700 Assessment Findings raised by ONR and EA at GDA closeout**
  - **60% are related to normal business design & engineering activities**
  - **30% are related to providing additional justification and sensitivity analyses**
  - **10% are related to the application of new requirements/methodologies which required analyses which will be performed by the end of 2013**

EPR™ design: the impact of the GDA process

- **GDA is a robust process which has showed that UK EPR™ is safe, secure and environmentally acceptable for construction in the UK**
- **Process provides a strong design basis for plant construction and for regulatory acceptance for the project to proceed**
- **NNB, ONR and EA have increased their knowledge of the EPR™**
- **GDA has revealed the importance of managing the differences between France and UK in terms of regulatory framework, culture and languages in the future phases of the project**

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Flamanville and Taishan: what can and cannot be transferred to the UK?

Can be transferred

- Engineering and design element
- Lessons learnt from the 3 active EPR™ projects in the world and from the use of FA3 Reference Plant Engineering and design element
- Supply chain experience

Cannot be transferred

- Redesign coming from GDA
- UK Regulatory and Legal context
- Local physical environmental issues, size of temporary facilities, new buildings
- Planning requirements and restrictions
- Qualification of new suppliers
- UK supply chain and construction capabilities

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AREVA integration in the HPC Project team

- **AREVA is fully integrated into the HPC Project team with other main suppliers**

> ***Be part of one team, with one purpose and one incentive.***

- **AREVA has experienced team members embedded into the Project team, working openly in same office with other main suppliers, participating in the main project meetings including the HPC Project Board**
- **AREVA is motivated to work together with other Project team members as one team, not for themselves, but for the success for the HPC project**

Success for the project will mean success

for all the team members!

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UK: A mirror to the global market place

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