



U.S. EPR EQ Program Update

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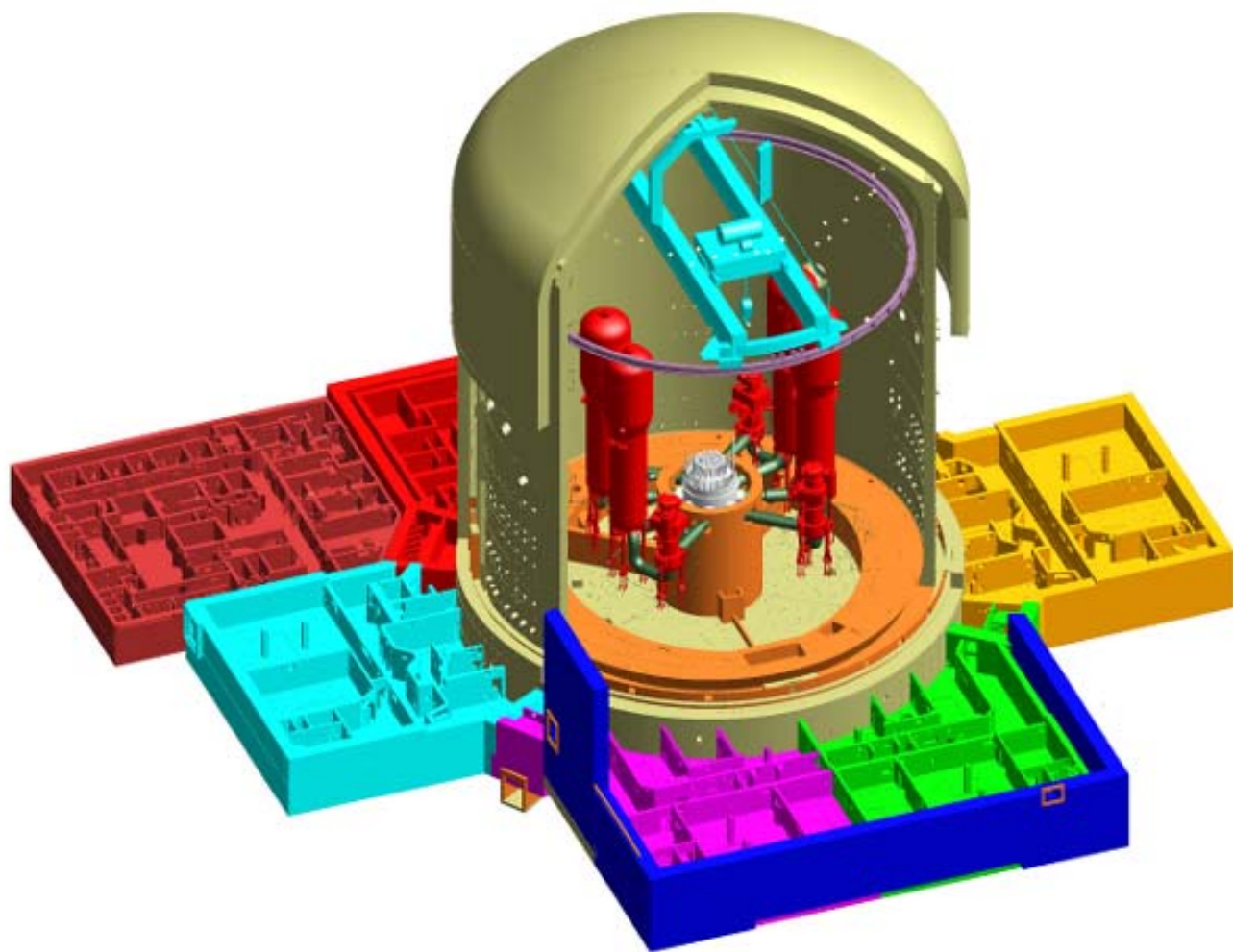
Presented at SC-2, Meeting 10-02
October 5-6, 2010, Seattle, WA



EPR is a trademark of the AREVA Group.

Overview of U.S. EPR™ Reactor

- ▶ Redundant safety systems are physically separated into four divisions, which protect the individual integrity of the electrical and mechanical safety systems.



The four divisions of safety systems are consistent with an N+2 safety concept.

One division can be out of service for maintenance

One division can fail to operate

The remaining two divisions are available to perform the necessary safety functions even if one of the two remaining trains becomes inoperable due to the initiating event.

Overview of the U.S. EPR™ Design

- ▶ **Evolutionary 4-loop PWR designed for a rated core thermal power level of 4590 MWt.**
- ▶ **The U.S. EPR™ unique design features include:**
 - ◆ **Four redundant trains of emergency core cooling.**
 - ◆ **Containment and shield building.**
 - ◆ **Core melt retention system for severe accident mitigation.**
- ▶ **The plant design objective is 60 years. The design provides for the replaceability of major components, including the steam generators.**
- ▶ **The Reactor Building is an integrated structure consisting of an inner Reactor Containment Building, an outer building called the Reactor Shield Building, and an annular space between the two buildings that separates them for protection against external hazards (including aircraft impact).**

Projects

4 EPR™ Reactors under construction



Flamanville 3



Olkiluoto 3



Taishan 1&2



General Orientation – Olkiluoto Island



Olkiluoto 3 Project – Project Progress

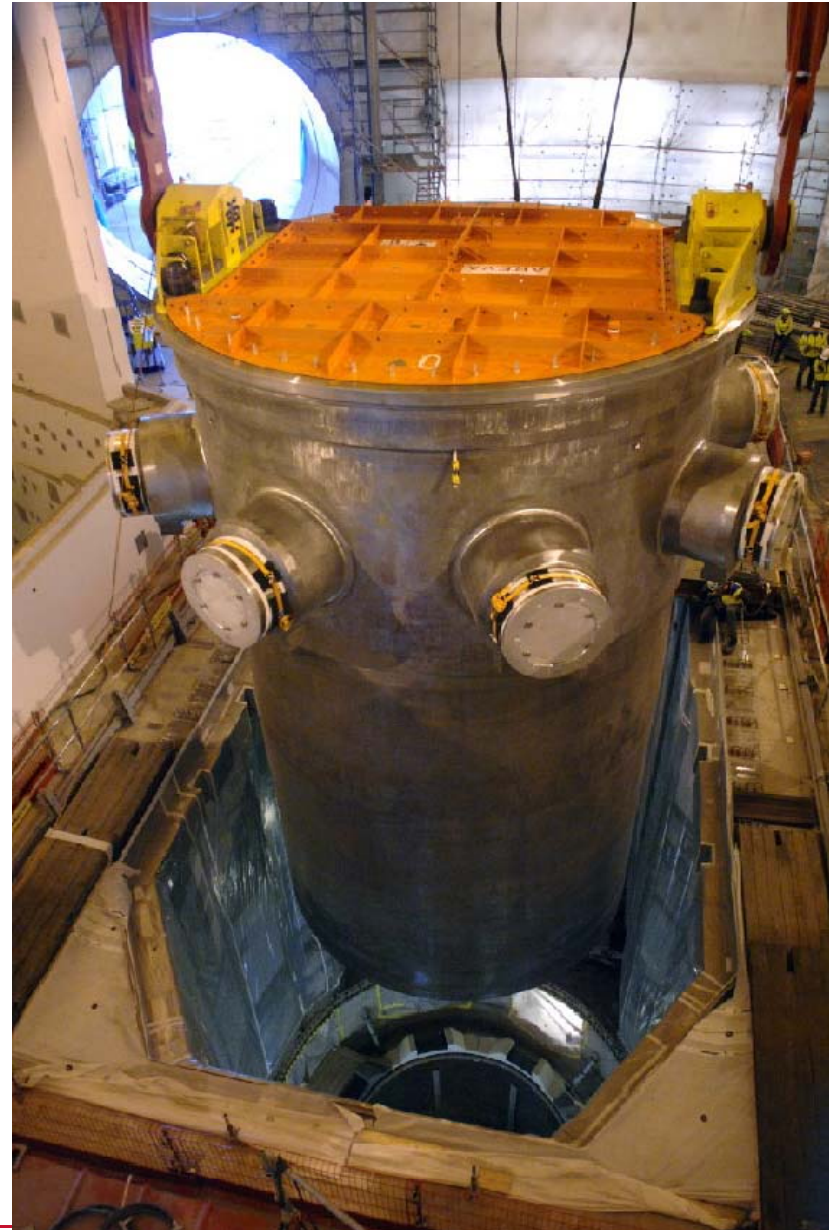
Installation of RPV

June 21, 2010

The reactor pressure vessel was first transported from its storage hangar to just outside the reactor containment, and then lifted into the reactor building before its final vertical introduction into the reactor pit

The steel component weighs 420 tons, and measures 5.3 meters in diameter and 10.6 meters in height.

It was installed using the permanent polar crane and a large movable crane.



OL3 Project Photo Update



OL3 Project Photo Update



EPR™ Flamanville 3 Project



Flamanville 3 Project – Project Progress

Reactor Building civil work progress:

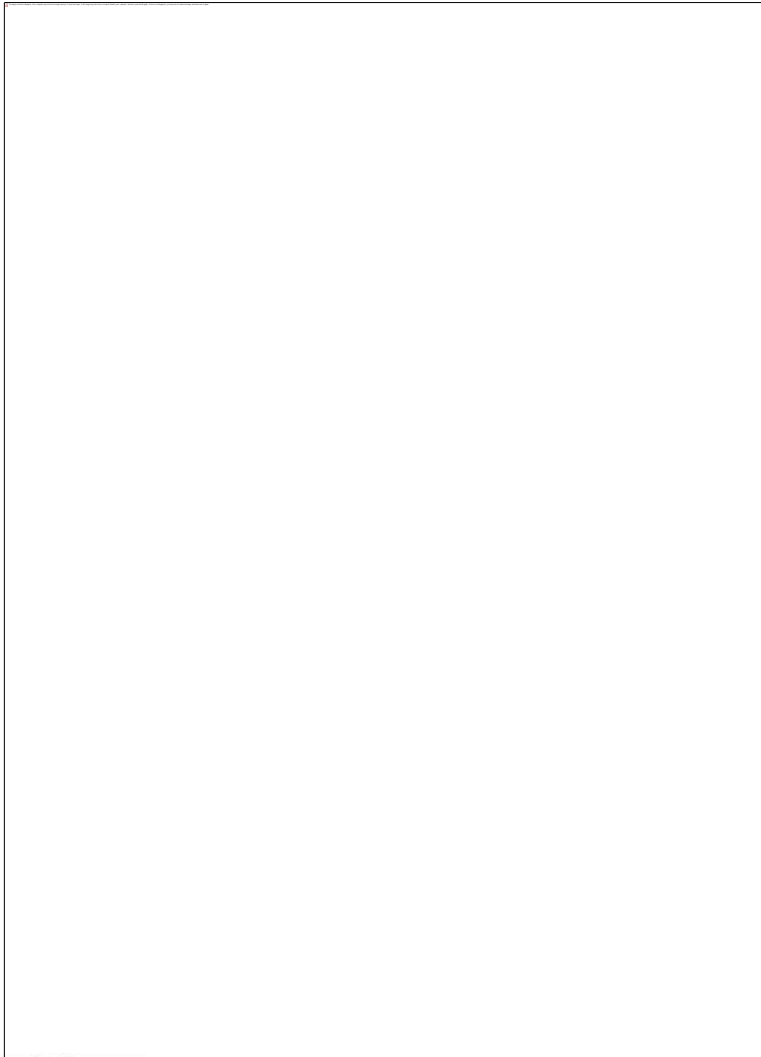
Seventh lift of the outer containment ongoing

Third lift of the inner containment ongoing

Reactor Building
April 2010



FA3 Project Progress



LEFT: Feedwater tank mounting in the turbine building
ABOVE : General View
May 2010

Taishan 1&2 Project



Taishan Project Progress

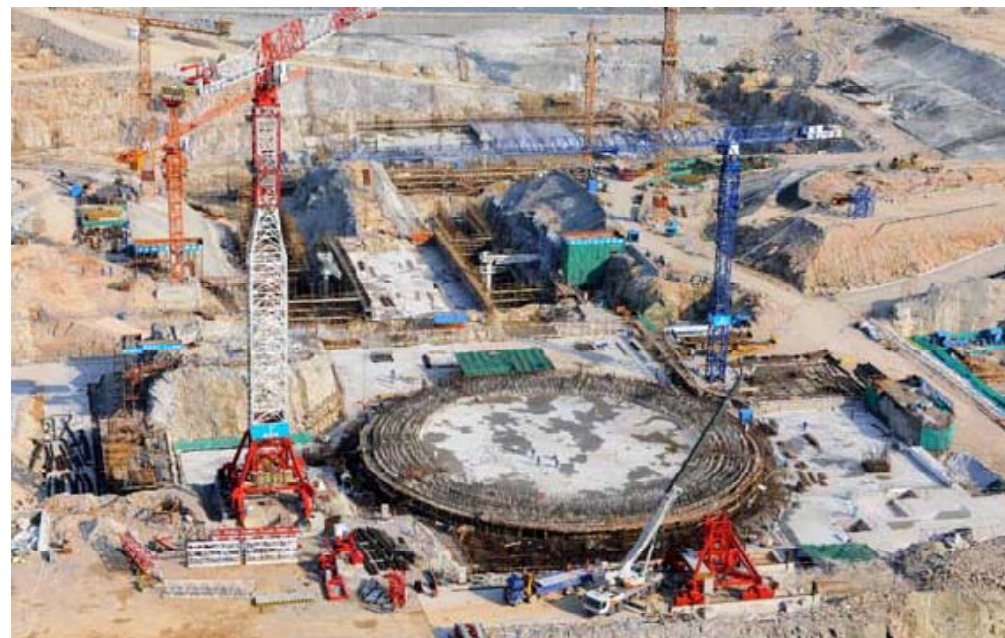


Unit 1 and 2 Site Overview

Taishan Project Photo Update



Unit 1



Unit 2

May 2010

Taishan Project Progress

► Lifting of the second ring of the containment liner of Unit 1

◆ Reactor containment liner 6.33m high



Highlights of Recent U.S. EPR Activity

General

- ▶ **The U.S. EPR design application is currently under NRC review.**
 - ◆ **A total of 3933 formal RAIs and 149 open items have been received as of August 20. AREVA has responded to 3495 questions and 86 open items.**
 - ◆ **Phase 1 review of the application, i.e., preliminary SER and all RAIs issued, was completed on 1/28/09. Phase 2 review (i.e., development of the SER with open items) and Phase 4 (i.e., development of the Advanced SER with no open items) on some sections is currently in progress.**
 - ◆ **A total of eleven chapter SERs with open items have been received to date and ten associated ACRS meetings completed.**
 - ◆ **Schedule date for NRC approval of the design application is December 2011.**
 - ◆ **Key issues involve civil-structural, I&C, new and spent fuel storage racks, and resolution of GSI-191 related to sump strainer clogging.**
 - ◆ **Of the 11 active topical reports, 6 have been approved, 3 have been issued a draft SER, 2 are under active review.**

Regulatory Status Regarding ASME QME-1 2007

- ▶ AREVA NP has agreed to utilize Revision 3 of RG 1.100 with clarifications regarding the non-mandatory appendices.
- ▶ AREVA NP uses ASME QME-1-2007 as guidance for qualifying active mechanical equipment with the exception that a separate mechanical equipment qualification (MEQ) program for the U.S. EPR™ design will not be maintained, as noted in U.S. EPR™ FSAR Tier 2 Section 3.11.2.2.

Engineering Implementation of ASME QME-1 2007

- ▶ **IEEE Standards 323-1974, 334-2006, 344-2004, and 382-2006 are used for qualification.**
- ▶ **Environmental Qualification (EQ)**
 - ◆ **EQ of electrical appurtenances meets the requirements of IEEE 323-1974.**
 - ◆ **EQ of the valve actuator meets the requirements of IEEE 382-2006.**
 - ◆ **EQ of the pump motor meets the requirements of IEEE 334-2006.**
 - ◆ **EQ of the valve is limited to the nonmetallic parts of the valve. EQ follows the guidance of non-mandatory Appendix QR-B of QME-1 for nonmetallic parts of the valve.**

Engineering Implementation of ASME QME-1 2007

► Seismic Qualification

- ◆ Seismic qualification performed in accordance with the requirements of IEEE 344-2004 and the guidance of RG 1.100, Rev 3.
- ◆ No earthquake experience based qualification allowed.
- ◆ Static deflection testing using QME-1-2002 as guidance is acceptable.

► Operability testing

- ◆ Follows the guidance of QME-1 2007 while being subjected to mechanical and operating loads (i.e., connecting pipe loads), design conditions or differential pressures as specified on the equipment data sheets, and the specified seismic accelerations.

Highlights of Recent U.S. EPR Activity

► Activities thru June 25:

- ◆ ACRS Subcommittee meeting held May 21 to discuss Chapter 19
- ◆ May 27: U.S. EPR™ FSAR Chapter 4 Public Meeting to discuss open items
- ◆ June 6-10: NRC GSI-191 Audit, Rockville, MD
- ◆ June 9: U. S. EPR™ FSAR Sections 3.7 and 3.8 NRC Public Meeting, Rockville, MD
- ◆ June 25: U. S. EPR™ FSAR Chapter 7 - I&C NRC Public Meeting, Rockville, MD

► DC Review Status as of June 25:

- ◆ Received 10 Phase 2 Safety Evaluation Reports with Open Items (Chap. 2, 3 (partial), 4, 5, 8, 10, 11, 12, 16, 17 and 19)
- ◆ ACRS Subcommittee meetings complete for 10 of 19 Chapters (2,4,5,8,10,11,12,16,17,19)
- ◆ ACRS Subcommittee meeting will be scheduled to discuss Chapter 15, Accident Analysis Methodologies
- ◆ NRC's Phase 2 technical review is complete for 11 of 19 Chapters (2,4,5,8,10,11,12,13,16,17, and 19)
- ◆ NRC GSI-191 Public Meeting scheduled for July 7 in Rockville, MD
- ◆ Since last report, received 127 formal NRC questions and provided 29 complete responses
- ◆ To date, received 3,916 formal NRC questions and provided 3,469 complete responses
- ◆ NRC QA Audit scheduled for June 28-July 1 in Lynchburg, VA

Notable Quotes



Areva Buys Out Remaining Stake in Wind Turbine Manufacturer Multibrid

June 7, 2010

AREVA announces its purchase of the remaining 49% of Multibrid1, a German wind turbine manufacturer, which becomes AREVA Wind, a wholly-owned subsidiary of the group.



Building of nation's largest nuclear plant 'right on track'

June 9, 2010

Construction of the Taishan Nuclear Power Plant is right on track, according to the website of China Guangdong Nuclear Power Holding Co Ltd, one of the nation's two major nuclear power plant operators.

THE WALL STREET JOURNAL

Areva: Olkiluoto 3 Reactor Pressure Vessel Installed

June 21, 2010



Stuk requests more details on EPR systems

June 4, 2010

The Finnish radiation and safety authority, Stuk, which first raised queries about the EPR's systems in December 2008, has now reviewed technical plans submitted by Teollisuuden Voima Oyj (TVO) concerning the control and safety systems of Olkiluoto 3. It concluded that "**no notable change**" would foreseeably be needed for the planned design.