



# PRESS CONFERENCE

3 September 2015

**Jean-Bernard LÉVY**  
Chairman and CEO

**Xavier URSAT**  
Group Senior Executive VP - New Nuclear Projects and Engineering



# EDF, A RESPONSIBLE ELECTRICITY COMPANY, A CHAMPION OF LOW CARBON ENERGY GROWTH

## ■ EDF, THE ELECTRICITY COMPANY EMITTING THE LEAST CO<sub>2</sub>

- World leader in nuclear power
- European leader of renewable energies  
1/3 of gross investments in group development dedicated to renewable energies
- Number 3 in European energy services

➡ An all time record low of CO<sub>2</sub> emissions for EDF in France in 2014

**17 g/kWh**

## ■ EDF, OFFICIAL PARTNER OF COP21



**Our goal: successful energy transition**



**FLAMANVILLE EPR,  
A MAJOR INDUSTRIAL  
PROJECT**

# SAFETY FIRST

- SAFETY FORMS THE BASIS OF OUR SPECIALISATION AS THE WORLD'S LEADING NUCLEAR OPERATOR

- For nuclear power plants in operation

- Principle of continuous improvement and factoring in of operating experience at international level

- For Flamanville EPR under construction

- The most powerful reactor with the latest safety and external hazard protection features

- Priority afforded to nuclear safety, quality of implementation and construction site safety



# A CHALLENGING CONSTRUCTION SITE



## ■ FOR EDF

- Future of the French nuclear fleet
- Contribution to the low carbon energy mix

## ■ FOR THE NUCLEAR SECTOR

- 3<sup>rd</sup> largest industrial sector in France
- Restructuring underway of the relations between EDF and AREVA
- Operating experience for Hinkley Point
- Multiple international development prospects

## ■ FOR FRANCE

- Key to energy independence
- Safe and competitive electricity
- Development of French expertise

# A LARGE-SIZED CONSTRUCTION SITE

- **Nearly 4000 persons** working on the construction site every day  
**150 contractor partners**
- **Completed stages**  
60% of the electromechanical erection and  
98% of the building civil structure
- **Industrial contingencies**  
inherent of a project of this size





# A NEW INDUSTRIAL ORGANISATION

# COMPLETE PROJECT REVIEW

- AN ORGANISATION BASED ON STREAMLINED MANAGEMENT REPORTING DIRECTLY

- DETAILED PROJECT REVIEW

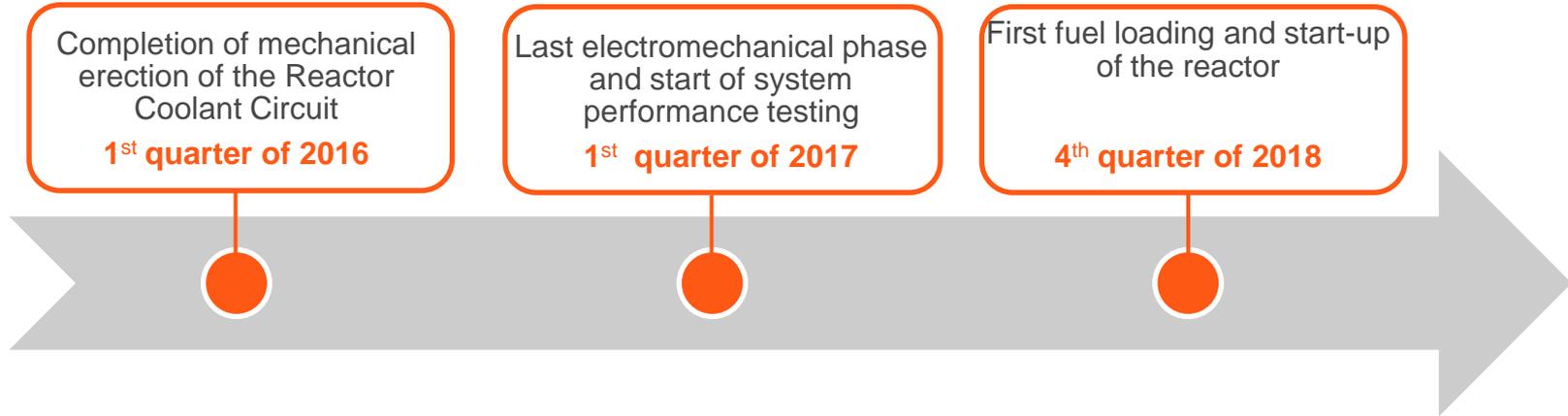
- Running modes, risk assessment and future lead times

- ACTION PLAN

- Restructuring with our suppliers
- A new roadmap
- Strengthened cooperation with the Nuclear Safety Authority



# 3 KEY MILESTONES FOR COMMISSIONING



Revised costs of € 10.5 billion\*

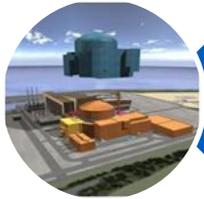
**Successful completion of Flamanville constitutes an absolute priority**



# OPERATIONAL PROJECT OVERSIGHT

***Xavier Ursat,***  
*Group Senior Executive VP - New Nuclear  
Projects and Engineering*

# OUR CONSTRUCTION SITE: CONSTRUCTION OF THE FIRST-OF-A-KIND UNIT, A SAFE AND EFFICIENT REACTOR



## PROTECTION AGAINST EXTERNAL HAZARDS

Earthquakes, floods  
Plane crash shell



## 4 INDEPENDENT SAFETY SYSTEMS

A 10<sup>th</sup> of the likelihood of core melt



## CORE CATCHER

Containment of radioactivity in the event of accident

➔ The world's most powerful reactor

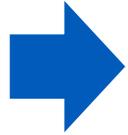
**1 650 MW**

➔ Optimised use of fuel  
- **17 % of burn-up\***

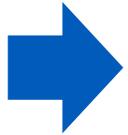
➔ Increased environmental performance  
- **30% of radioactive release and waste\***

\* Compared to 1300 MW reactors

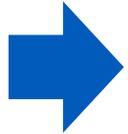
# THREE PRIORITIES



**Optimised project coordination and organisation**



**Processing of ongoing technical matters**



**Schedule and cost control**



# OPTIMISED PROJECT COORDINATION AND ORGANISATION

# ORGANISATION AND WORKING METHODS

## ■ FOR EDF

- Streamlined management, shortened decision-making loops
- Clearer responsibilities
- Oversight, coordination and reporting committees
- Reinforced management presence on site
- Transfer of knowledge and skills renewal



**Guarantee industrial management and improve productivity  
on the construction site**

# ORGANISATION NAD WORKING METHODS

## ■ FOR OUR PARTNERS

- Common roadmap
- New incentives contract framework



**Strengthened coordination, shared aims and consolidated collective commitment**



**TECHNICAL MATTERS  
BEING ANALYSED**

# ADDITIONAL REACTOR VESSEL COMPLIANCE TESTING

- Higher carbon content in a limited zone on the reactor vessel bottom and head
- A new test programme to demonstrate reactor vessel resistance submitted to the Nuclear Safety Authority for approval

Expected results in 2016

# PROCESSING OF WELDING DEFECTS ON THE MAIN PRIMARY CIRCUIT

→ 4 welds with quality defects out of the 24 completed

→ Weld reworks being carried out

Two of the four welds have already been processed

# TECHNICAL QUALIFICATION OF THE PRESSURISER RELIEF VALVES

- ➔ 1<sup>st</sup> qualification tests in 2014 with anomaly on one relief valve due to test conditions and not to the relief valve itself
- ➔ 2<sup>nd</sup> series of qualification tests successfully performed in 2015, with design items to be improved
- ➔ In the future: last design qualification tests and endurance tests on the relief valve

Ongoing technical review with the ASN and IRSN



**A PROJECT  
IN PROGRESS**

## COMMISSIONING OF THE CONTROL ROOM



Inauguration of the control room and first commissioning tests

## COMPLETION OF INNER CONTAINMENT CONCRETING



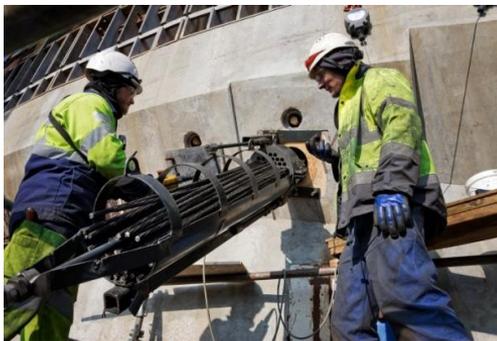
View of the completed inner containment

## ENTRY OF THE 4 STEAM GENERATORS AND ASSEMBLY OF THE REACTOR COOLANT CIRCUIT



Entry of the motor for the first of the 4 reactor coolant pumps

## END OF THE PRE- STRESSING OPERATIONS



Insertion of the pre-stressing tendons in their sheathing

## DELIVERY AND ENTRY OF THE DIESEL GENERATORS



Entry of the last diesel engine for the SBO diesel generator in the northern diesel building

## COMMISSIONING APPLICATION FILE SUBMITTED TO THE ASN

First quarter of 2015

# UPCOMING CONSTRUCTION SITE MILESTONES

- **1st quarter of 2016: Completion of primary circuit mechanical erection**

Completion of welding operations and piping inspection

- **1st quarter of 2017: Last electromechanical erection phase and start of system performance testing**

Implementation of several test series, system by system and then as a whole

- **4th quarter of 2018: First fuel loading and start-up of the reactor**

Last operations before the reactor power build-up phase



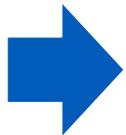
# CONCLUSION

*Jean-Bernard Lévy*

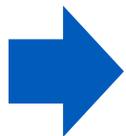
# FLAMANVILLE 3, A PRIORITY FOR EDF



**Collective deployment of EDF and its partners**



**A key project for the French nuclear sector and its success internationally**



**Legal commissioning framework: installed nuclear capacity capped at 63.2 GW in France (Energy transition law)**



*Your questions*