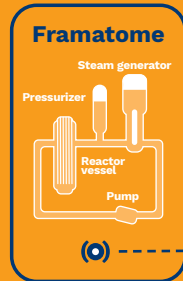


edvance nce

ENGINEERING
—
PROCUREMENT
—
CONSTRUCTION
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COMMISSIONING

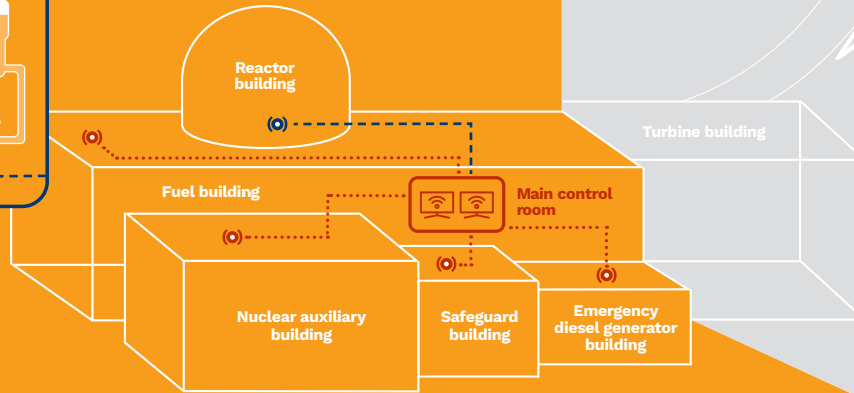
edvance

Engineering
▽
Procurement
▽
Construction
▽
Commissioning



NUCLEAR ISLAND

CONVENTIONAL ISLAND



EDF / a project company / an ad hoc consortium

EDVANCE MISSION

Edvance was created to be EDF Group's NI EPCC (Nuclear Island Engineering/ Procurement/Construction /Commissioning).

Edvance contributes to all EDF New Nuclear Projects worldwide.

EDVANCE IN FIGURES



2019 REVENUE
€501m



+2500
ENGINEERS
TECHNICIANS



50 years
OF EXPERIENCE IN NUCLEAR
ENGINEERING, IN FRANCE
AND ABROAD

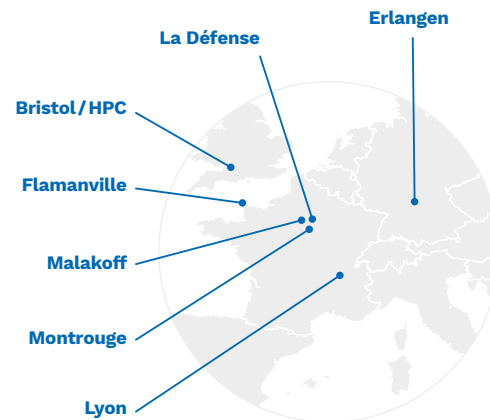
4.7 MILLION
HOURS OF
ENGINEERING
FOR 2019

3 MAJOR
OPERATIONAL
PROJECTS



8

GEOGRAPHIC
SITES
IN EUROPE



6 PROJECTS
FOR THE FUTURE

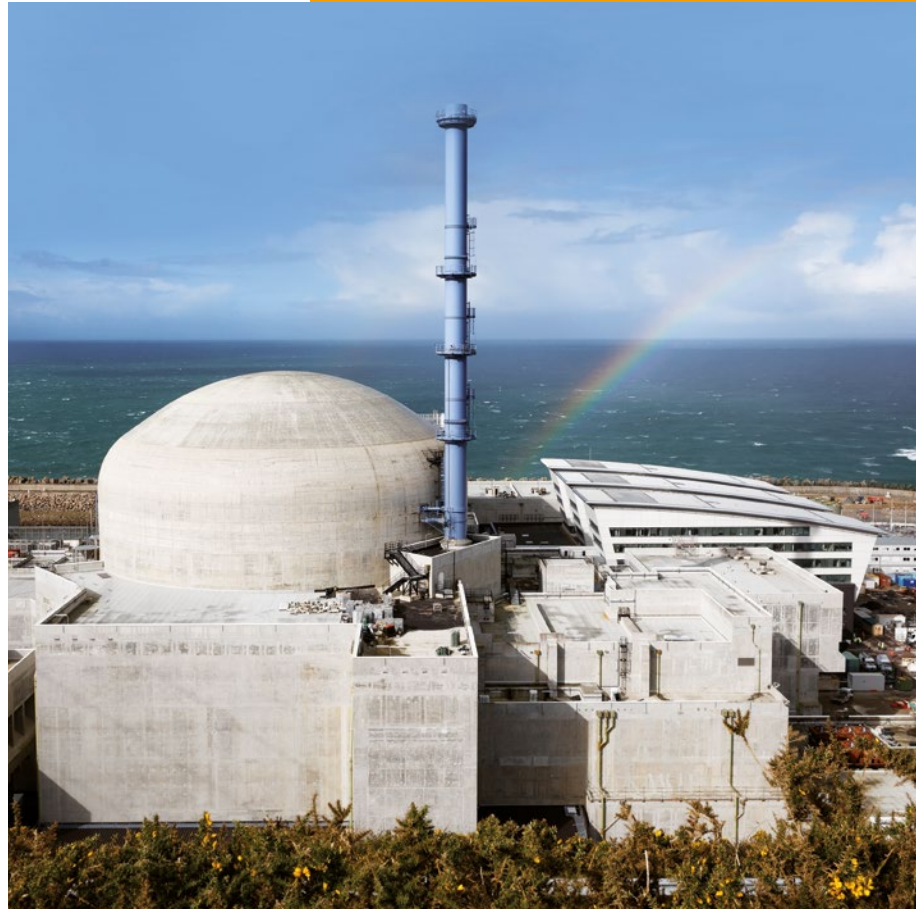
OUR CURRENT AND FUTURE PROJECTS #1

EPR Flamanville 3, a First of a Kind in France

The EPR design integrates the best existing standards and techniques. It incorporates state of the art developments in safety, environmental protection, technical and financial performance to provide safe, competitive and carbon-free electricity generation.

Edvance is a key contributor in the design of the NI of Flamanville 3 and also provides extensive engineering services to the project, as well as support for the commissioning: hot functional test support, preparing handover to the operator, support for activities after fuel loading and additional engineering services requested during commercial operation.

Through its contribution to the Flamanville 3 project, Edvance continues to increase its engineering experience of the detailed design of this new generation of reactors, for the benefit of other EPR Projects.



OUR CURRENT AND FUTURE PROJECTS #2

EPR Hinkley Point C, Two Reactors in the United Kingdom

Hinkley Point C (HPC) will supply nearly 7% of the UK's electricity consumption and create 25,000 jobs in the UK as well as opportunities for local and national companies during construction. In 2016, HPC took the investment decision that will allow the first reactor to be commissioned in 2025.

For this project, Edvance is in charge of NI design and its I&C (Instrumentation & Control), provides support to HPC for procurement, and provides support to construction & commissioning activities. The teams are mobilised to carry out NI engineering and benefit from the lessons learned of ongoing EPR projects, and notably from Flamanville 3.

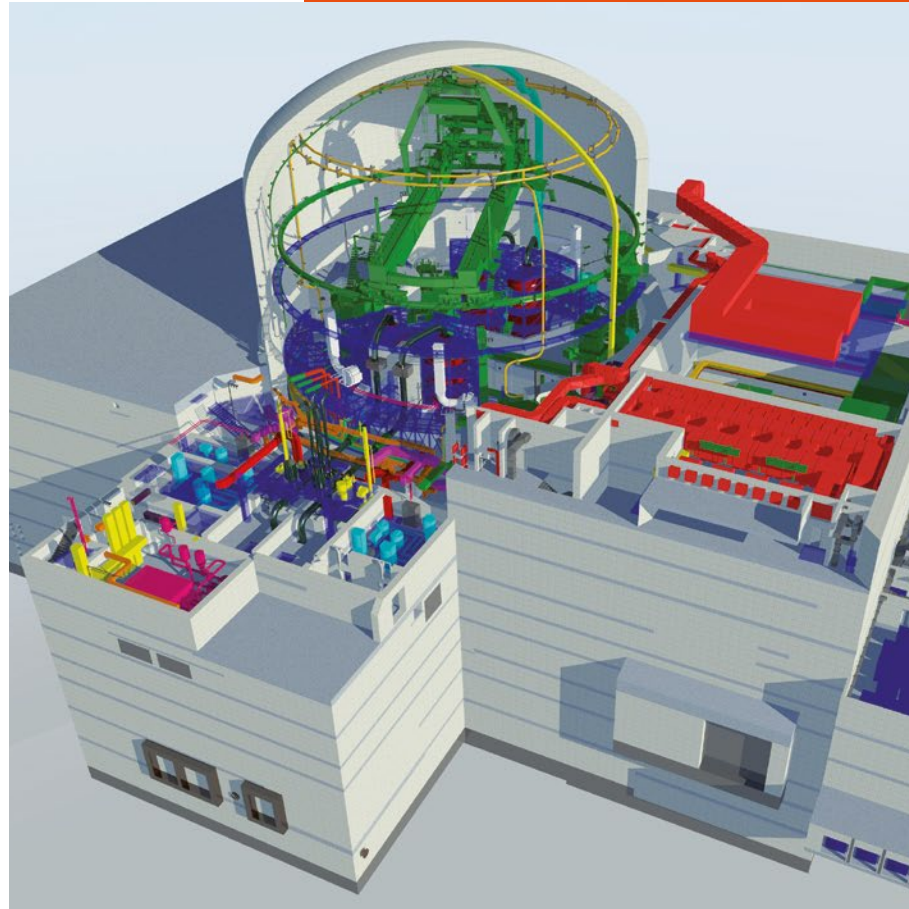


OUR CURRENT AND FUTURE PROJECTS #3

EPR2, the Optimised Model for Tomorrow's New Nuclear Reactors

The construction of EPR reactors in France is an essential step amongst other investments to ensure the security of electricity supply whilst EDF is preparing for the renewal of its nuclear fleet. The EPR2 Model is the optimised version of the current EPR Model already in service in Taishan in China (2 units in commercial operation since respectively 2018 & 2019). Its purpose is to improve and secure the constructability by transforming engineering methods and tools. The investment decision is scheduled for the end of 2022.

Currently in this basic design phase, Edvance is developing the new EPR2 Model on the scope of NI studies, I&C (Instrumentation & Control) and is preparing the preliminary safety report to be submitted at the end of 2020.



OUR CURRENT AND FUTURE PROJECTS #4

Edvance Looks Ahead to the Future

Edvance is a key player in the development of new nuclear power plants worldwide.

The development of future projects is handled by dedicated multi-disciplinary teams, from identifying client needs to preparing project execution.

As for existing projects, Edvance is in charge of the NI EPCC of future projects, where EDF carries out the commercial front-end role to the client (future owner-operator).

The company is currently preparing projects in India (Jaitapur), United Kingdom (Sizewell) and Saudi Arabia. On each international project, Edvance develops in-country partnerships in order to execute the project in close collaboration with the local industry.





EPR Simulator for Training and Engineering Needs

The EPR full scope simulator is a full-scale reproduction of the main control room, equipped with computational tools allowing accurate simulation of the behaviour of the nuclear power plant and its I&C (Instrumentation & Control).

Developed by Edvance for the Flamanville 3 project, a simulator is also being developed for HPC project.



The simulator is used for

- operator training,
- validation of normal and incident / accident operating procedures,
- support to other engineering activities (human factors, I&C, systems engineering, commissioning).

Dedale: an Innovative Cable Routing Tool

Dedale allows cable routing to be performed during the different phases of a project (from basic design to detailed design).

It is an automatic routing tool interfacing with the 3D Model tool that offers real time savings. The tool is scalable to meet the needs of different customers and projects. It includes an optimisation feature that automatically balances the cable flows on the cable trays and also a 3D Viewer, which enables the routing user to check the routing directly in the routing tool.

Dedale is an intuitive Edvance creation: it adapts to the installation network of cable trays that are designed to meet the requirements of the EPR projects.



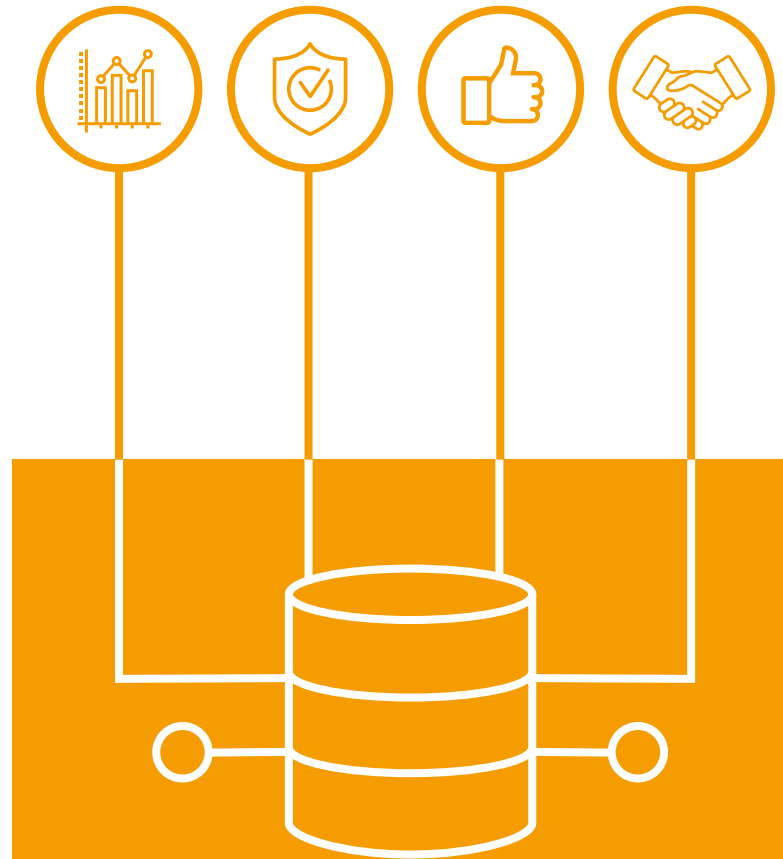
RTI2: Simplification and Performance

The RTI2 initiative aims to formalise requirements integrated into specifications to be part of call for bids sent to potential equipment suppliers.

Implemented by Edvance in the frame of the EPR2 MHSI pump call for bid, this approach identifies all the requirements, structure them and allows traceability to their origin. Once identified, these requirements are hierarchized according to upstream and downstream requirements. They are then applied to related equipment according to the product architecture.

The requirement management approach can be applied to each piece of equipment for any EPR project. It is associated with the conformity matrix which is completed by equipment suppliers to indicate if they comply with each requirement or not.

The RTI2 approach increases the performance of projects, simplifies the specifications and the calls for bids. It allows quicker and more accurate bids analysis and therefore improves interfaces with equipment suppliers.



Edvance Optimises BIM Using Different 3D Models

Firstly, the Plant Data Management Systems (PDMS) software enables Edvance to create 3D Models to optimise the design of an industrial structure, favouring collaborations between all the disciplines and offering spatial visualisation for installations. The database associated with a geometric 3D Model is used to store the information which contributes to the functional or hardware definition of components, progress monitoring of studies or the management of contractors.

Over the course of projects and experience, the PDMS 3D Model has been enriched to reach a very high level of detail. This is the case for the HPC and EPR2 projects.

Secondly, on the HPC project, for concrete studies, the PDMS 3D Model is transferred into another tool (TEKLA) to study reinforcement. This tool allows good coordination between all trades to ensure that the design is feasible on site and there are no clashes between reinforcement, embedded parts and anchor plates.

Using this way, Edvance checks full consistency of the design during the engineering process, testing the construction methods first virtually in order to facilitate on-site operations and improve safety and lead times.



Trust
—
Daring
—
Collective spirit



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