

SUBJECT 1

PRESENTATION OF PROJECT AND SITE CONSTRUCTION

The French nuclear power units will be 40 years, lifetime for which they have been designed, around 2020 for the first units. The aim of Flamanville 3, nuclear reactor of EPR type (European Pressurized Reactor), is to replace all or part of the current nuclear plants and to ensure the demand for electricity is met as of 2020. Its beginning of operation in 2012 means the nuclear fleet's renewal can be prepared on the basis of the building and operating experience acquired with this new plant before a decision to extend this approach is taken.

The EPR plant comprises a 1650 MW¹ electrical reactor, known as a third generation² reactor, due to the design improvements that the reactor has benefited from. These improvements particularly concern the safety of the plant and the protection of the workers against radiation. Efforts have also focused on improving the reactor's environmental performance by reducing the amount of waste and effluents in relation to the energy produced.

The choice of the Flamanville site to build the EPR series head unit was mainly due to:

- reserved areas and prior developments which are already available,
- favourable environmental conditions: sea water for cooling, geological quality of the rock,
- the region's warm acceptance of the project.



The Flamanville nuclear power plant (CNPE) is situated on Flamanville municipality land, on the coast, in the department of La Manche (50), 21 km south-west of Cherbourg. Designed from the outset to accommodate four nuclear production units, it currently comprises two identical 1300 MWe nuclear units which are pressurized water type reactors and two pre-developed platforms which can host two new units as the aerial photo on the left shows.

¹ MWe = megawatt-electrical (1 megawatt = 1,000 kilowatts = 1,000,000 watts)

² There have been several generations of electro-nuclear plants: generation 1 corresponds to the first industrial reactors which appeared in the 1960s and which are currently being dismantled; generation 2 reactors are those which are currently in use; generation 3 reactors correspond to a technological development made on generation 2 reactors, they incorporate the same concepts and are currently available on the market; generation 4 is at the prototype stage as these reactors aim to implement new concepts.

The new Flamanville 3 unit will be located at the foot of a cliff next to unit 2, in the continuation of the sea water intake channel, as the photomontage below shows. It has its own buildings which house:

- the nuclear reactor which produces energy,
- the auxiliary and safeguard systems which are connected to the reactor and which ensure the plant is managed correctly during normal operating and accident conditions,
- the turbine and the generator which convert the energy into electricity,
- sea water pumping which ensures cooling.

Furthermore, it shares with the existing plants some common site buildings which may have to be adapted. This is particularly the case for the administration buildings, the canteen, the purification plant and two new buildings to be erected for Flamanville 3 and which will benefit the whole site: the new electrical building and the sea water desalination plant.



The commissioning of the Flamanville 3 plant is planned for mid 2012. The unit's operating lifetime is estimated at 60 years. Prior to commissioning, the construction phase lasts six and a half years and includes site preparation works and the erection of the buildings.

The preparatory works, which last 18 months, include the building site's installation, the Flamanville 3 platform earth-moving operations, the undertaking of buried structures (pipe galleries) and soil consolidation (implementation of foundation and bedding concretes).

They are followed by the construction of buildings including civil engineering and then the electrical engineering assemblies during approximately 3 years. These works require the use of heavy plant such as cranes and special convoys for the transportation of large components.

In the meantime, the main sea discharge structure is built. This structure stretches from platform 3 to a sea discharge pit about 700 metres from the shore. It is built partly from an off-shore platform and partly from a land-based pit.

Finally, the start-up tests, which last 20 months, are carried out on the various parts of the plant to make sure it performs as planned.

☞ **TO FIND OUT MORE**, please see:

- *Documents 5 et 6* **Piece B - Chapter I: Main characteristics of the plant**
Piece B - Chapter V: The plant's construction site