The Chernobyl Shelter: a Mega-structure for a Safe Confinement

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Abstract

The New Safe Confinement (NSC) project consists of a steel structure with a complex cladding system, on piled concrete foundations, destined to cover the "Object Shelter", which was constructed over the Chernobyl Nuclear Power Plant reactor N°4. This reactor n°4 was destroyed in an accident in 1986.

The project was awarded in October 2007 to a Joint Venture "NOVARKA" (VINCI and BOUYGUES).

The NSC is an arch structure with a span of 257m, 162m long and 108m high. Its final skidded weight is 36 000 Tons. Foundations, permanently and temporary, involve some 800 piles of 1m diameter, driven or drilled to up to 25m, and near 120 000 m3 of reinforced concrete.

Two main cranes suspended at the ceiling of the arch will enable the dismantling operations of the "object Shelter". A flexible sealing membrane is ensuring the air-tight connection between the arch and the existing buildings.

Keywords: arch; sealing membrane; main crane; cladding; tilting panels; skidding; confinement; maintenance; piled foundations

1 Introduction

The power plant of Chernobyl is located approximately 100 km north of Kiev, in Ukraine (Fig.1). It contains 4 typical reactors RBMK units, including the damaged unit 4 due to the nuclear explosion on the 26th of April 1986. The supply of electricity has completely stopped (reactor 1 in 1986, reactor 2 in 1991, and reactor 3 in 2000).

Nevertheless, about 4000 people continue to work on the site for the supervision and the maintenance of the damaged unit (and also for the 3 other units), and for the decontamination of the site.

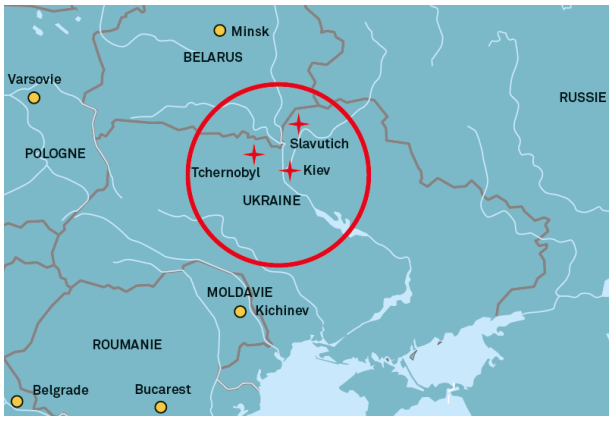

Figure 1. Chernobyl location

1.1 The accident

On the 26th of April 1986, the largest civil nuclear accident happened, with the explosion of the reactor n°4 (Fig.2).

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