



Chernobyl's New Safe Confinement moved into position

The process of moving the massive structure over the destroyed Unit 4 reactor building was completed in late November.

Thirty years after the nuclear disaster at Chernobyl, in Ukraine, the radioactive remains of the destroyed Unit 4 have been safely enclosed by a giant arched structure in one of the world's most ambitious engineering projects (NN, Dec. 2016, p. 22). The New Safe Confinement (NSC) will safeguard the radioactive structures and tons of nucle-

ar fuel still inside the reactor for at least a century.

To reach its final resting place, the NSC was slid on rails—propelled by a system of hydraulic jacks—a distance of 327 meters (about 357 yards) from the point of assembly. The process began on November 14, 2016, and was completed on November 27. Seven of the days in that

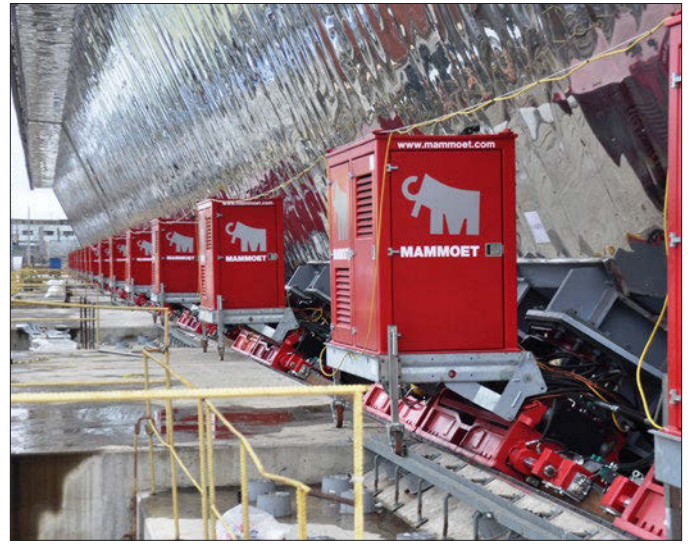
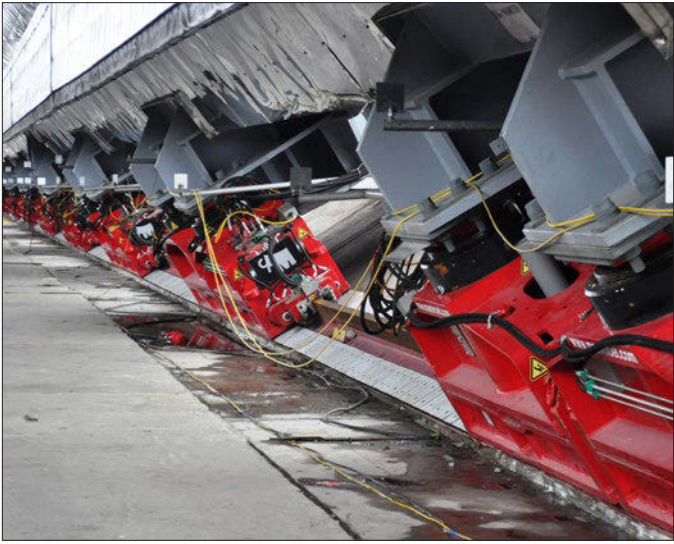
time span involved the sliding of the structure; on other days, maintenance, installations, and equipment checks were performed.

The NSC now encloses the makeshift shelter that was hastily assembled over the reactor from June to late November 1986 to contain the highly radioactive materials inside the reactor building.



Above: An aerial view of the New Safe Confinement (NSC). The photo shows the tilting panels—which will eventually be closed over openings in the structure once it is in place over the old Chernobyl-4 shelter—undergoing testing. (Photo taken August 4, 2016)

Left: This view of the east end of the NSC was taken on November 14, the day the sliding of the structure to cover the old shelter began. The tilting panels are in their full-open position, and the “cutouts” to allow the arched structure to fit over the old shelter are in full view.

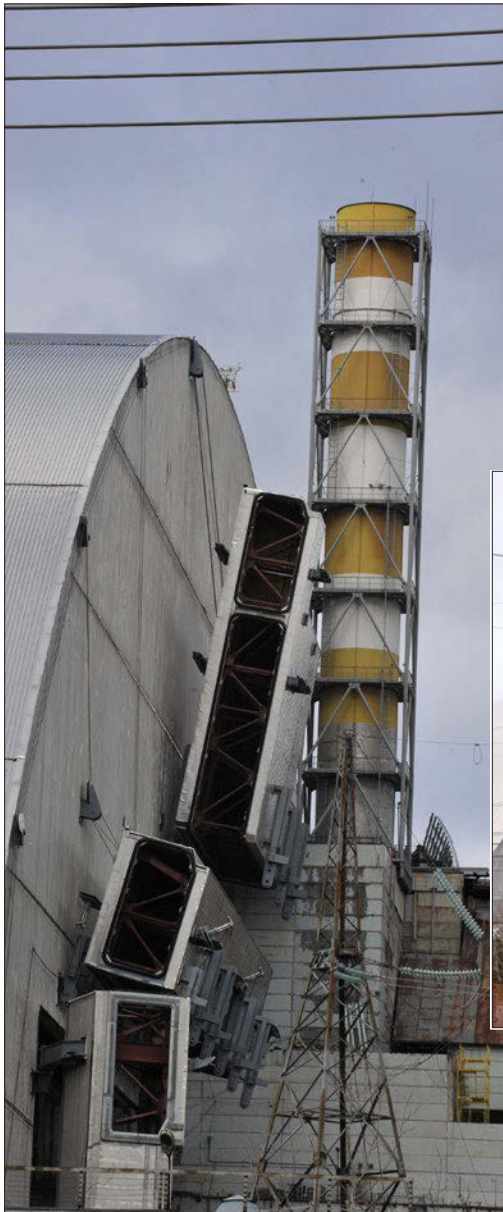


The mechanism developed to propel the NSC consists of a complex array of components. The photo at left shows the “skidding shoes,” which house the 224 push-pull jacks that moved the arch into place. The photo at right shows the skidding system’s power units. The targeted speed for the movement of the arch was 10 meters (about 33 feet) per hour. The sliding of the structure occurred on seven days from November 14 to 27, with maintenance and other tasks performed on other days during that period.

To mark this achievement, a special ceremony was held at the site on November 29. The event, which attracted significant media attention, was attended by Ukraine President Petro Poroshenko and other officials, as well as representatives of the international donor community that provided the bulk of the funds for the project. The donor list includes the European Bank for Reconstruction and Development (EBRD), which was tasked with managing the financing of the work to secure the site and is the largest single donor to the project.

The NSC, in its final position, also contains an array of equipment, including remotely controlled cranes and machinery that will be used in the dismantling of the old shelter and in managing other debris. The equipment will be connected to the new technological building, which will serve as a control room for future operations inside the NSC. After intensive testing and commissioning of all the equipment, the NSC is to be handed over to the Chernobyl nuclear power plant administration in November 2017. Suma Chakrabarti, EBRD president, commented: “The spirit of cooperation gives us confidence that the project will be completed on time and within budget a year from now.”

Continued



Upon completion of the arch-moving operation, the NSC is in place over the old shelter. The portion of the building that is not covered by the NSC is part of the Unit 4 turbine hall. Walls have been built inside both the east and west ends of the turbine hall structure to ensure the confinement of radioactive materials. The tilting panels were still in their open position on November 28, when this photo was taken from a southeast vantage point. The adjacent photo provides a close-up side view of the tilting panels.

The NSC is the largest moveable land-based structure ever built, with a span of 257 meters (about 281 yards), a length of 162 meters (about 177 yards), a height of 108 meters (about 118 yards) and a total weight of 36,000 metric tons equipped. It will make the accident site safe, and with its 100-year lifetime will allow for dealing with all of the remains of the destroyed reactor.

The structure was built by Novarka, a consortium of the French firms VINCI Construction Grands Projets and Bouygues Travaux Publics. Construction of the arch began in 2012, following exten-

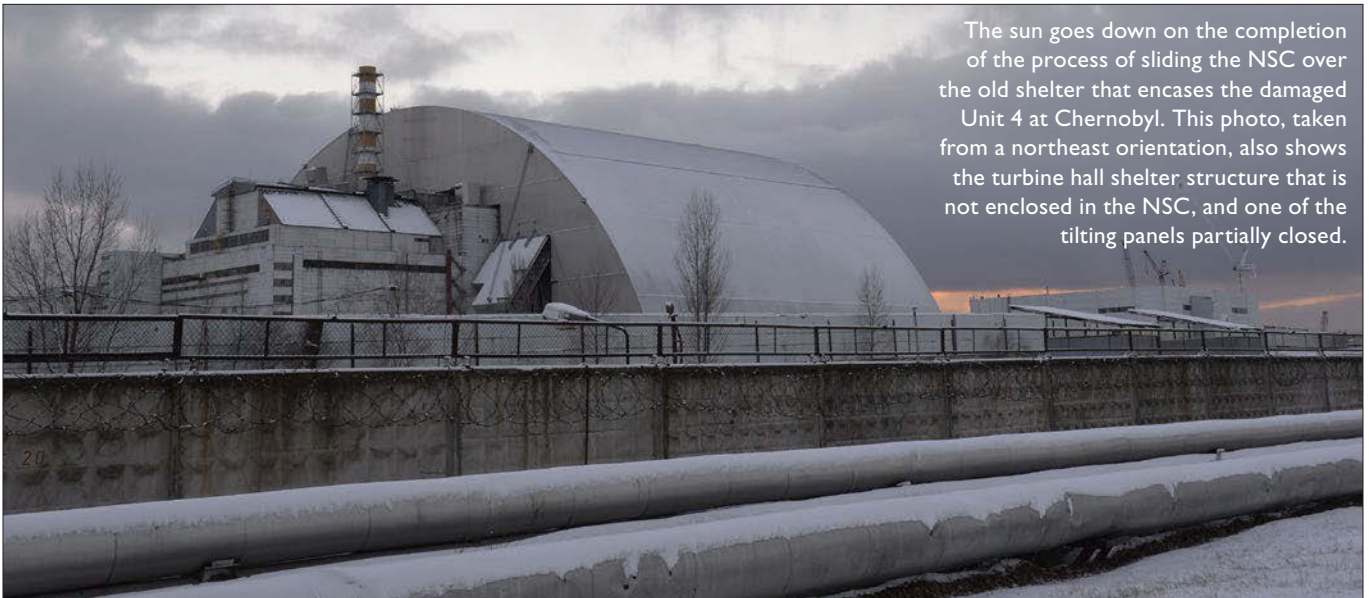
sive site preparation work. With a cost of €1.5 billion (about \$1.6 billion), the giant structure is the most prominent element of the Chernobyl Shelter Implementation Plan, which involved more than 300 projects and activities. The €2.1 billion (about \$2.23 billion) plan is financed by the Chernobyl Shelter Fund, which was established in 1997 and has received more than €1.5 billion from 45 donors to date.

According to Novarka Project Director Nicolas Caille, “The New Safe Confinement . . . is a feat of engineering that will ensure optimal safety conditions for the

Ukrainian people for the next 100 years.”

Igor Gramotkin, director-general of the Chernobyl nuclear power plant, said, “We were not building this arch for ourselves. We were building it for our children, for our grandchildren, and for our great-grandchildren. This is our contribution to the future, in line with our responsibility for those who will come after us.”

A video of the arch being moved over the damaged portion of Unit 4 can be viewed at <www.ebrd.com/what-we-do/sectors/nuclear-safety/chernobyl-new-safe-confinement.html>. (Photos: EBRD)



The sun goes down on the completion of the process of sliding the NSC over the old shelter that encases the damaged Unit 4 at Chernobyl. This photo, taken from a northeast orientation, also shows the turbine hall shelter structure that is not enclosed in the NSC, and one of the tilting panels partially closed.



A special ceremony was held on November 29 at the Chernobyl site to celebrate the completion of the process of moving the NSC into place over the old Unit 4 shelter. The event, which drew significant media attention, was attended by Ukraine President Petro Poroshenko (at center, with hands together), as well as representatives and officials from the EBRD, international donors, the joint venture construction company Novarka, and others. Among those officials and dignitaries at the ceremony were Igor Gramotkin, director, Chernobyl nuclear power plant; Suma Chakrabarti, president, and Vince Novak, director of nuclear safety, both of EBRD; Hans Blix, chairman, Chernobyl Shelter Fund; Xavier Huillard, chief executive officer, VINCI Construction; and Nicolas Caille, project director, David Driscoll, head of safety, and David Coulet, head of construction, all of Novarka.



The photo above, taken on March 17, 2008, shows the stabilization work that was done at the deteriorating west wall of Unit 4's old shelter structure. Below is a view of that stabilized west wall taken on January 11, 2017, from inside the NSC structure.

