

## A CRUCIAL YEAR FOR CHERNOBYL *By Nicola Davies, PsyD*

Chernobyl: site of the world's worst nuclear accident and a chilling example of what can happen when nuclear power goes wrong. The disaster at the Chernobyl Nuclear Power Plant was initially contained, back in 1986, by the hastily constructed concrete sarcophagus that covers reactor number four. The cover was intended to last for 15 years but it has not yet been replaced; 28 years later, it remains the only barrier between us and the highly dangerous nuclear waste it covers.

Now a massive engineering project is under way to create a "new safe confinement," known as an NSC, to cover the original concrete sarcophagus. It is an international initiative budgeted at €1.5 billion (\$1.7 billion in 2015 U.S. dollars). It is apparent that it will cost much more.

Work started in 1998, when engineers began laying the groundwork for the project. First, they had to stabilize the existing concrete

JULY 2015: CHERNOBYL NEW SAFE CONFINEMENT PROJECT



MARCH 2015: THE EXCLUSION ZONE



The NSC, expected to be complete in 2017, will encapsulate the failed nuclear reactor four and its original containment shell, preventing the release of contaminated material. To protect workers, the massive structure is being assembled near the site and will later be put into position. Meanwhile, in the 29 years since the disaster, wilderness has overtaken the apartment blocks and other facilities built for the nuclear power plant's workers.

sarcophagus covering the stricken reactor. Key elements of working infrastructure were also needed for construction to commence. A huge, concrete-lined construction site for building the new structure, just 600 feet from the plant, was created on a cushion of soil that was trucked in from uncontaminated sites.

That structure consists of a massive steel arch: 360 feet high, 820 feet wide, and 492 feet long. The 30,000-ton structure, once complete, will be moved into place on vast metal tracks. It would have been too dangerous to build it in situ because of remaining levels of radioactivity, so the “safe containment” will be the largest movable structure in the world. The concrete piles on which it is to rest have already been prepared.

### Key issues

The highest portion of the arch was built at ground level and then jacked 98 feet into the air—to limit workers’ radiation exposure (which increases with elevation). Huge “legs” were swung into place to support the structure, and construction continued until the entire arch ultimately reached its final height of 360 feet.

Workers on-site are monitored regularly for their level of radiation exposure, despite experts’ claims that the site is safe enough to allow for a 40-hour work week. Thanks to the decontamination of the construction site and the construction of a concrete barrier, workers’ exposure is supposedly equivalent to a chest X-ray.

Construction began in 2010 and is approaching its final stages. However, the European Bank for Construction and Development says that overspending resulted in a funding shortfall of €600 million (\$669 million) by the end of 2014, and currently amounts to €85 million (\$95 million) despite additional funding from EU countries.

Although the NSC won’t be ready in 2015, as initially hoped, some say 2017 is likely. Jochen Flasbarth of the German Environment Ministry predicts it may take another four to five years. The EBCD expects that the funding will be forthcoming and that the project will be completed, despite Russia’s decision to withhold its share. (The Chernobyl plant was built in 1977, when Ukraine was part of the Soviet Union.)

### Urgent need

The NSC is designed to shield the surrounding environment from radiation for a century. The interior of the arch will house huge, remotely controlled cranes, which will be used to dismantle the old concrete shelter while the gigantic shell will protect the site from the elements and prevent radiation leakage.

Worldwide environmental safety is at risk because the reactor’s existing housing is crumbling. An estimated 200 tons of extremely radioactive material remain, including the fuel rods that are still within the damaged reactor. Without the NSC, there is serious danger of a second Chernobyl catastrophe.

Another structure, the Vektor Radioactive Waste Storage Facility, is being built nearby. It will be used to store up to 75,000 cubic meters of radioactive waste that will result from the deconstruction of the Chernobyl plant. Once this waste has been safely disposed of, Chernobyl will no longer be a ticking time bomb, and the monumental arch of the NSC facility can be left to rust.

### Chernobyl today

The ghostly exclusion zone, or so-called “zone of alienation,” that spans a radius of 18 miles around the site of the reactor, was opened to tourists and the media in 2011. More than 53,000 people had been evacuated from the surrounding areas. The entrance is still guarded by armed soldiers, and a Geiger counter allows visitors to assess their radiation exposure levels.

Although people are moving back into the exclusion zone, formal resettlement could be delayed by decades, and it is estimated that the area will remain uninhabitable for the next 20,000 years. The informal resettlers—average age 65—were initially told that the evacuation would be temporary. Now they either don’t believe in the harmful effects of radiation or no longer care.

Ivan Ivanovic, 77, a former plant worker, lives in his neat farm cottage outside Pripriyat, a city built to service the workers at the Chernobyl plant and their families. Ivanovic’s mother and both his sisters died as the result of the disaster. He has returned home to live out his days in the shadow of Chernobyl. He believes that he can sense radiation without a Geiger counter.

Mikhail Masanovitz and his wife, a couple in their seventies, are also among the few that attempt to scratch out a living here. They keep chickens and a pig for meat and eat the vegetables they grow in the contaminated soil. Despite their attempts at self-sufficiency, they depend on food brought to them by charitable organizations.

Animals seem scarce here. There is a complete lack of birdsong. Trees seem to be thriving, though, as the forest reclaims Pripriyat and its surroundings. Nature is taking back the land and the melding of two worlds—natural and man-made—seems to form a ghostly interaction. For a few minutes, it makes me wonder which of these worlds is real.

### Lessons learned

The Chernobyl incident has been costly—financially, environmentally, and in loss of human life and health. Secrecy and a lack of disaster preparedness led to delayed evacuation of local inhabitants—and then to deaths, illnesses, and deformities. Two people died during the incident, while 28 people died from acute radiation sickness in the weeks following the evacuation and cleanup. The death toll is impossible to calculate accurately as the illnesses and deaths resulting directly from radiation exposure cannot be determined and may not be reported. According to WHO, only 50 people had died as a direct result of the explosion up to 2005, but scientists estimate that roughly 4,000 people may die as a result of illness caused by radiation.

Initial attempts to contain the disaster proved ineffective, leading to the deaths of firefighters and construction workers. Scientists who studied the disaster after evacuation lived in Pripriyat without taking any special precautions, and they too died. Although the cause of the disaster can be traced to poor Soviet reactor design and deadly errors by the plant’s operators, Chernobyl’s greatest lesson is that disaster preparedness counts.

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