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Q+A: What's going on at Japan's crippled nuclear power plant?

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By Shinichi Saoshiro

TOKYO (Reuters) - Japanese engineers are inching toward gaining control of the Fukushima Daiichi nuclear power plant which was crippled by an earthquake and tsunami on March 11, triggering the world's worst nuclear disaster in 25 years.

Tokyo Electric Power (Tepco), the owner of the plant, began operating decontamination and cooling systems in June, taking it closer to a cold shutdown of reactors that suffered meltdowns early in the crisis.

WHAT IS HAPPENING?

The disaster in March knocked out the cooling systems at the Daiichi plant, 240 km (150 miles) northeast of Tokyo, causing meltdowns of nuclear fuel rods at three of the plant's six reactors.

As an emergency measure, Tepco cooled the reactors by pumping in tens of thousands of tons of water, much of it drawn directly from the sea. Some of that water is now stored in huge tanks and some is still in the basements of the reactor buildings, threatening to leak into the ocean.

Drawing on technology from French, U.S. and Japanese companies, Tepco completed a system to decontaminate the accumulated water and pump it back to cool the reactors.

The system started on June 17 and has repeatedly stalled but, as of July 5, Tepco had treated nearly 14,000 tons of water. It estimates that 120,000 tons of highly radiated water has accumulated at the plant.

The pace of the decontamination is running at about 80 percent of Tepco's initial plan and the utility may not meet its self-imposed target to complete the decontamination by January.

WHAT IS HAMPERING TEPCO?

The decontamination system was built in a hurry from a patchwork of technologies and its very complexity -- it has to remove oil and radioactive substances and desalinate the water in different steps -- has left it prone to breaking down.

The cooling system uses 4 kilometers (2.5 miles) of plastic piping that snakes through the compound, which is a headache to maintain.

Tepco is also stretched with a full load of other tasks. It is covering some of the reactor buildings with giant structures to contain radiation and is also injecting the reactors with nitrogen to prevent hydrogen explosions.

The searing summer heat is another challenge for the workers, with the threat of dehydration and heat stroke that much greater due to the protective suits and masks they have to wear.

HOW LONG WILL THE CRISIS LAST?

Tepco aims to stabilize the plant by January. But with the gradual revelation of the true extent of the damage to the reactors, many experts said the process could take longer.

On Monday, Tepco will review its self-imposed clean up plan, first released in April, and may amend some of its targets.

Even after the plant is under control, clean-up work at the site is expected to continue for years.

WHAT ARE SOME OF THE CONSEQUENCES OF THE DISASTER?

Nearly 80,000 people have been forced to evacuate their homes, most of them from a 20-km (12-mile) radius around the plant.

Living in fear of radiation has become part of life for residents both near and far from the plant.

The crisis has prompted Japanese Prime Minister Naoto Kan to call for a complete review of national energy policy and a bigger role for renewable sources such as solar power.

It has also hampered efforts to restart reactors idled for regular checks, raising the possibility of power outages during the peak summer and winter demand periods.

A poll last month showed nearly 70 percent of Japanese opposed restarting idled reactors, although that would mean having to cut back on power use and would threaten economic activity.

(Reporting by Shinichi Saoshiro; Editing by [Edwina Gibbs](#) and Edmund Klamann)

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