Nuclear crisis man-made, not 'an act of god': experts

Government, Tepco blamed for failure to prepare for tsunami

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Staff writer

Despite protestations from the government and Tokyo Electric Power Co. that the tsunami that knocked out the Fukushima No. 1 nuclear plant was unforeseeable, noted seismologists and nuclear experts say the crisis is largely man-made.

Kojiro Irikura, an honorary professor of seismology at Kyoto University who was on the committee drawing up quake resistance guidelines for nuclear plants in September 2006, said that the Fukushima plant lacked effective "multiple protections" at some key facilities.

Another committee member and nuclear plant expert, Kunihiko Takeda of Chubu University, criticized the government for not demanding that power companies be prepared for natural disasters, in particular tsunami like the massive waves that knocked out the critical cooling systems at three of the six nuclear reactors at the No. 1 plant.

"The Fukushima No. 1 plant crisis was not caused by tsunami, but by lack of multiple safeguards," Irikura said. "The guidelines stipulate nuclear plant operators must minimize risk even from unexpected events."

The multiple safeguards that Irikura referred to are anything but complicated. "I mean, for example, surrounding key facilities with walls and ceilings," he said.

Of the four nuclear power stations on the Pacific coast, only the Fukushima No. 1 plant lost its cooling systems and ended up emitting radioactive substances.
It's not uncommon for nuclear reactors to be located near the sea, where seawater can easily be used to cool the water that then cools the reactors.

In all there are 14 reactors at the four facilities along the Pacific coast, where the tsunami triggered by the March 11 quake killed thousands of people. All shut down automatically after the quake and their emergency diesel generators kicked in. But at the Fukushima No. 1 plant the subsequent tsunami knocked out all the power that was supposed to keep critical safety systems running to cool the reactors' fuel rods until external power could be restored.

In contrast, two of the three emergency diesel generators at the Tokai nuclear plant in Ibaraki Prefecture withstood the tsunami thanks to 3.3-meter walls put up by operator Japan Atomic Power Co around the two seawater pumps. The pumps are critically important because they send water to cool the emergency generators, which in turn power the cooling systems for the reactors.

The walls were built specifically to defend against tsunami, while the one for the third pump had not been completed yet, spokesman Koji Otake said.

At the Fukushima No. 1 plant, the seawater pumps were exposed to the environment.

The seawater pumps at the Fukushima No. 2 plant are housed in buildings and therefore remained intact. Tepco was able to bring the reactors there under control once external power was restored.

Still, Otake of the Japan Atomic Power Co. admitted the three pumps might have been severely damaged if the tsunami had been as high as in Fukushima, where it is believed to have been at least 10 meters.

The Tokai plant is located 6.11 meters above sea level, which means the tops of the walls protecting the pumps are 9.41 meters above sea level.

The emergency diesel generators at the Onagawa nuclear plant in Miyagi Prefecture were not submerged because the plant is 14.8 meters above sea level, Tohoku Electric Power Co. spokesman Sota Notsu said, adding that the company took tsunami into account when building the plant.

The exact heights of the tsunami that hit the four nuclear plants aren't known.

While Irikura pointed to Tepco's unpreparedness at the Fukushima No. 1 plant, Takeda of Chubu University said the government, which promotes nuclear power as a clean source of energy to the world, is responsible for checking the safety of nuclear plants.

Quake guidelines for nuclear plants, revised by the Nuclear Safety Commission in September 2006, essentially order power companies to design plants without compromising safety in case of earthquakes "that can be expected no matter how rare."

In the only place in the guidelines where tsunami are mentioned — the last sentence of the 14-page document — it stipulates that plants must be designed "not to have their safety greatly compromised by tsunami, which can be expected no matter how rare."

"The guidance is not very specific and thus it is up to the power companies' discretion to assume the scale of quakes and tsunami," Takeda said.

It does not use terms understandable to ordinary people to describe the power of quakes, such as magnitude and "shindo," the Japanese seismic scale that tops out at 7. The wording is meant for seismic experts and construction designers, he said.

"I am a nuclear expert, not a quake expert. I didn't understand the guidance very much, so I asked other committee members to use words people understand. But they didn't listen," he said.

"The guidance is useless. The truth is that the government made sure in the guidance that it doesn't take responsibility in case disasters beyond expectation break out," said Takeda, who promotes safe nuclear power plants.

Meanwhile, Irikura of Kyoto University expressed regret that the tsunami risk is hardly mentioned.
"I am sorry and feel responsible," he said. "We should not use an excuse that disasters beyond expectation have broken out."