Prime Minister Yoshihiko Noda (second from right) is briefed by Tepco officials on Sunday on top of the badly damaged reactor 4 building. KYODO

Noda lauds work to ease reactor 4 fuel threat; fears remain

Progress seen toward extraction but big quake could derail process

By REIJI YOSHIDA and KAZUAKI NAGATA

Staff writers

OKUMA, Fukushima Pref. — The highlight of Prime Minister Yoshihiko Noda's trip to the Fukushima No. 1 plant Sunday was his inspection of the reactor 4 building, one of the public’s chief sources of concern since it contains over 1,500 dangerous fuel assemblies left exposed to the environment since the roof was blown off by a hydrogen explosion last year.

Tokyo Electric Power Co. workers escorted Noda to the building's 11-meter-deep spent-fuel pool to demonstrate that its surface remains horizontal, in a bid to ease fears that the structure is tilting. Noda listened to the guides attentively, nodding several times as they explained the pool's current status.

More than 1½ years since three of the facility's reactors suffered core meltdowns following the Great East Japan Earthquake and tsunami that overran the complex, many experts across the world remain alarmed about the possibility of the reactor 4 building...
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The government and Tepco have repeatedly assured that such a nightmare scenario will not occur, claiming the structure has been significantly reinforced with steel pillars and concrete walls that mean it can now withstand a quake measuring as high as upper 6 on Japan's seismic intensity scale to 7.

By clambering to the roof, Noda demonstrated to the public that radiation levels — which peaked at 400 microsieverts per hour during his inspection — are not severe enough to prevent entry to or work inside the building.

Tepco employees have been working on the fourth floor, where the spent-fuel pool is situated, in order to begin removing the 1,533 fuel assemblies by the end of next year and to transfer all of them to another spent-fuel pool designed for long-term storage by the end of 2015.

Most debris had been removed by July, and workers are currently laying the foundations for a specially equipped crane that will delicately extract each fuel assembly from the pool.

"I felt there has been steady progress toward decommissioning the (crippled) reactors," Noda told reporters later the same day, aiming to ease public fears about reactor 4. "We need to maintain a sense of tension until the very end (of the work), paying all requisite attention to safety at the No. 1 plant and to the health of the workers."

Removing all of the fuel assemblies from the spent-fuel pools in the four wrecked reactors is projected to take around 10 years, but decommissioning reactors 1 through 3 by removing melted fuel from their cores could last more than 40 years, according to the government's long-term plan for the facility.

Experts say the risk of another disaster on a par with the March 2011 meltdowns has considerably decreased over the past year, with the focus increasingly shifting to the long-term risks, such as the durability of on-site equipment and the possibility of powerful quakes jolting the area in the near future.

"There won't be any more serious trouble unless something extraordinary happens," said Hajimu Yamana, a Kyoto University professor who sits on the committee overseeing the power station's long-term management.

Still, "you can't totally deny the possibility of (another) gigantic earthquake" striking the site, he warned.

In addition to unit 4, the buildings housing reactors 1 and 3 also were heavily damaged by hydrogen explosions but only their fifth floors were destroyed. The rest of the two structures, including the fourth floors housing spent-fuel pools, survived virtually intact, Yamana said.

However, the blast in the reactor 4 building extensively damaged the fourth floor as well, and despite the reinforcement work, the overall structure is not as strong as before, he said.

"So we need to speed up work as far as unit 4 is concerned," Yamana added.

The spent-fuel pool Tepco plans to relocate the 1,533 fuel assemblies to by the end of 2015 was constructed on the ground level of a separate structure on the compound, and is therefore considered more resilient if another major temblor were to occur. The long-term storage pool also has an enhanced and more robust cooling system.

The group of reporters allowed to accompany Noda on his visit Sunday noticed many changes compared with the first media tour of the No. 1 plant, which authorities organized last November, including some that may suggest a considerable improvement in safety conditions.

For example, decay heat from the spent-fuel pools and the damaged reactor cores has significantly declined as the fuel rods continue to emit radiation.

Decay heat from the pool of reactor 4 has dropped to 0.7 megawatt, down from 2.26 megawatt in March last year, and is forecast to fall to 0.51 megawatt in 2013 and to 0.43 the year after. Decay heat from the reactor cores, meanwhile,

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Decay heat from the reactor cores, meanwhile, has fallen to 1 megawatt from 2.35 megawatts over the past year, according to Tepco data.

The ever-decreasing heat levels are gradually reducing the risk of the reactors suffering another disaster because Tepco will have more time to repair their critical coolant water systems.

Most of the vulnerable hoses that carried coolant water inside the compound, which total around 4 km in length, already have been replaced with more durable pipes made of polyethylene, and Tepco plans to have all the remaining hoses replaced by the end of December.

Most mainstream scientists are meanwhile in agreement that the level of radioactive materials discharged by the three wrecked reactors, though unprecedented in scale in Japan, are unlikely to cause major health problems to Fukushima Prefecture residents and are even less likely to affect those farther afield.

"Few people will develop cancer as a consequence of being exposed to radioactive materials released from the Fukushima No. 1 plant last year — although those who do will never know for sure what caused their disease," an article in the online edition of Nature, a leading scientific journal, claimed May 23.

"These conclusions are based on two comprehensive, independent assessments of the radiation doses received by Japanese citizens, as well as by the thousands of workers who battled to bring the shattered nuclear reactors under control," the article said, citing findings by the U.N. Scientific Committee on the Effects of Atomic Radiation and the World Health Organization.

But many members of the public, especially those calling for the complete abolition of nuclear plants, worry about the long-term durability and quake-resistance of key equipment and facilities at the No. 1 plant.

For instance, five of the six thermometers fixed to the bottom of the reactor 2 pressure vessel — critical devices as they enable Tepco to glean more information about the condition of the reactor core — have suffered technical glitches since December for as yet undetermined reasons, raising questions as to the durability of various equipment necessary to support the decades-long decommissioning process.

On Oct. 3, Tepco barely managed to set up a new thermometer at the bottom of the massively contaminated pressure vessel, but 45 workers were exposed to radiation of up to 2.2 millisieverts in the process.

And on Sept. 22, a remote-controlled crane dropped a 470-kg iron beam that plunged into the spent-fuel pool of reactor 3.

After measuring radiation levels and examining the water quality, Tepco concluded that its fuel assemblies probably did not sustain serious damage.

Still, the incident renewed fears of major accidents taking place during the lengthy process of decommissioning the reactors.

In an interview Friday with The Japan Times, Lower House lawmaker Sumio Mabuchi, who headed a project to reinforce the reactor 4 building, declined comment on the structure's current quake-resistance since he hasn't seen the latest data from Tepco or the government.

But Mabuchi — who served as special adviser to then-Prime Minister Naoto Kan at the very height of the nuclear crisis from March to June 2011 — also pointed out that his team had originally considered a more drastic measure to reinforce the building: plugging every available space on the lower floors with concrete.

"The reinforcement steps (adopted) were a first-aid measure, and I kept saying we should buttress the building with permanent measures" instead, said Mabuchi, a member of the ruling Democratic Party of Japan.

"We believed (flooding the reactor 4 building) with concrete was necessary as a permanent measure and held discussions about the subject," he said. "But right
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But the government eventually gave up on the proposal because it would have taken about a year to complete the work and aftershocks as high as magnitude 7 were repeatedly rocking the No. 1 plant at the time.

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