

Official: Spent fuel rods exposed, heightening concerns

By the CNN Wire Staff

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NEW: "Extremely high" levels of radiation, says NRC chief

NEW: Situation is "very, very serious," says nuclear expert

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IAEA chief plans an overnight trip to Japan, says damage to cores of 3 units is confirmed

Tokyo (CNN) -- Spent fuel rods in Unit 4 of Japan's stricken Fukushima Daiichi nuclear plant have been exposed, resulting in the emission of "extremely high" levels of radiation, the head of the U.S. Nuclear Regulatory Commission said Wednesday.

"What we believe at this time is that there has been a hydrogen explosion in this unit due to an uncovering of the fuel in the fuel pool," Gregory Jaczko told a House energy and commerce subcommittee hearing. "We believe that secondary containment has been destroyed and there is no water in the spent fuel pool, and we believe that radiation levels are extremely high, which could possibly impact the ability to take corrective measures."

The water served to both cool the uranium fuel and shield it. But once the uranium fuel was no longer covered by water, its zirconium cladding that encases the fuel rods heated, generating hydrogen, said Robert Alvarez, senior scholar at the Institute for Policy Studies and a former official with the Department of Energy.

That caught fire, resulting in a situation that is "very, very serious," he told CNN. He said the next solution may involve nuclear plant workers having to take heroic acts. Asked to be more specific, he said, "This is a situation where people may be called in to sacrifice their lives. ... It's very difficult for me to contemplate that but it's, it may have reached that point."



How bad is Japanese radiation risk?

Photographs of the building released Wednesday by the power company showed a hole in a wall and deterioration of the roof.

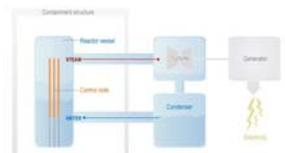
A Japanese Self-Defense Force helicopter aborted its mission to drop water over the reactor because of the high radiation levels in the area, Japanese public broadcaster NHK reported.



Evacuations at damaged power plant



Gallery: Japan reeling after massive quake



Explainer: Producing nuclear energy

Officials have been working to resolve cooling problems at four of Fukushima Daiichi's six reactors in the wake of the 9.0-magnitude earthquake and tsunami that devastated northeast Japan Friday.

Jaczo said U.S. nuclear officials were monitoring "as best we can" the four reactors. Three of them were operating at the time of Friday's 9.0 earthquake and were shut down following their normal procedures, he said. All of them, he said, appeared to have suffered "some degree of core damage from insufficient cooling caused ultimately by the loss of off-site power and the inability of the on-site diesel generators to operate successfully following the tsunami."

Three reactors were being cooled with seawater and their primary containment vessels were described as "functional," he said.

But core cooling was "not stable" for unit No. 2, he said. Though the primary containment appeared to be functioning, "we believe that the spent fuel pool level is decreasing."

At unit No. 3, he said, the integrity of the spent fuel pool appeared to have been compromised and there may have been a reaction between the zirconium cladding and the water.

Jaczo's grim announcement confirmed fears that the nuclear crisis would worsen. They had already heightened earlier in the day, when officials observed white vapor rising from the Fukushima Daiichi nuclear plant's reactor No. 3.

For two other units, an IAEA report indicates that the water in the spent fuel pool was down "a little bit," he said. He had no "significant information" about the final unit.

Tests on tap water in Fukushima city, 80 kilometers (50 miles) away, found radiation, though at levels not harmful to the human body, and later tests showed no radiation in the water, government officials said.

International Atomic Energy Agency Director General Yukiya Amano will travel to Japan "as soon as possible, hopefully (Thursday)," he said Wednesday, to get the latest on the situation and to see how the U.N.'s nuclear watchdog agency can best help Japanese authorities, he said. He will stay one night, he added.

Japan's chief cabinet secretary, Yukio Edano, initially said a breach in the containment vessel -- the steel and concrete shell that insulates radioactive material inside the reactor -- may have been the cause of Wednesday's white vapor. But he said later it was unlikely that the vessel suffered severe damage, the Kyodo news agency reported.

Officials told workers at the plant to evacuate Wednesday after the vapor rose above the plant and radiation levels spiked. Radiation levels later fell, and authorities allowed the workers to return, the Tokyo Electric Power Company said.



White smoke rising from power plant

The number of nuclear workers remaining on site was slashed Tuesday from 800 to 50 but had grown to 180 by Wednesday afternoon, the power company said.

About 200,000 people living within a 20-kilometer radius of the plant have been evacuated; those living 20 to 30 kilometers from the site have been told to remain inside. Authorities also have banned flights over the area.

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But the Japanese precautions were not universally embraced. The U.S. Embassy in Tokyo was recommending that U.S. citizens who live within 50 miles (80 kilometers) of the plant evacuate or take



Radioactive material leaks from plant

shelter indoors, U.S. Ambassador to Japan John Roos said in a statement Wednesday.

"Their standards are different from ours based on how far you should evacuate," White House spokesman Jay Carney said Wednesday. He called the situation "very fluid."



Will Japan nuclear crisis linger?

That view was confirmed by NRC's Jaczko. "For a comparable situation in the United States, we would recommend an evacuation to a much larger radius than has currently been provided in Japan," he said.

The U.S. military also said it will not allow troops within 50 miles of the plant, Col. David Lapan, a Pentagon spokesman, said Wednesday.



Map: Fukushima Daiichi

U.S. President Barack Obama was briefed Wednesday by the chairman of the U.S. Nuclear Regulatory Commission on the "deteriorating situation" of the damaged nuclear reactors, Carney said.

Tsunamis
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The weather has emerged as a key concern, but on Wednesday afternoon, winds were blowing out to sea, CNN International Meteorologist Jennifer Delgado said.

Between Units 3 and 4, Japanese authorities said they had measured radiation dose rates of up to 400 millisieverts per hour, IAEA reported Tuesday. That's equivalent to about 2,000 chest X-rays per hour, the agency said on its website. "This is a high dose-level value, but it is a local value at a single location and at a certain point in time," it added.

As a result of the monitoring of about 150 people from around the Daiichi site, 23 have been decontaminated, IAEA said.

"Their situation is not great," said David Brenner, director of the Center for Radiological Research at Columbia University. "It's pretty clear that they will be getting very high doses of radiation. There's certainly the potential for lethal doses of radiation. They know it, and I think you have to call these people heroes."

A meltdown occurs when nuclear fuel rods cannot be cooled and melt the steel and concrete structure containing them. In the worst-case scenario, the fuel can spill out of the containment unit and spread radioactivity through the air and water. That, public health officials say, can cause both immediate and long-term health problems, including radiation poisoning and cancer.

CNN's Stan Grant, Steven Jiang, Sabriya Rice, Elise Labott and Richard Greene contributed to this report

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