Japan: Nuke plant meltdown warning went unheeded

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Japanese nuclear power plant operators were totally unprepared for the potential long-term loss of power supply, a lifeline to help cool nuclear reactors, according to people with knowledge of the matter.

Meanwhile, the Japan Nuclear Energy Safety Organization (JNES) released last fall a simulation in which a nuclear reactor would have a core meltdown and other consequences only 100 minutes after losing its cooling capabilities.

The fact that the nation had been warned of the worst-case scenario is likely to pressure the government and electric power companies to review their nuclear designs and screening process.

The JNES comes under the jurisdiction of the Ministry of Economy, Trade and Industry and is an independent administrative institution tasked with studying nuclear safety. It wrote a report in October last year after examining seven types of nuclear reactors and carried out simulations of quake-triggered severe accidents at the reactors.

It studied how a boiling water reactor (with an output capacity of 800,000 kilowatts) identical to the No. 2, 3, 4 and 5 reactors at the Fukushima No. 1 Nuclear Power Plant would react once it lost its power source and the function to cool the reactor core halted.

The study shows that a meltdown began about one hour and 40 minutes after the water- pumping function stopped. About 3 hours and 40 minutes later, the pressure container broke down and about 6 hours and 50 minutes later the containment vessel also ruptured.

At the Fukushima nuclear plant, the pressure within the containment vessel of the No. 1 reactor abnormally surged at 1:20 a.m. on March 12, about 8 hours and 40 minutes after the reactor's water-filling function failed. Radioactive steam was vented from the containment vessel and a hydrogen explosion occurred at 3:36 p.m. the same day.

In the No. 3 reactor, the water injection function malfunctioned, prompting the release of radioactive steam and triggering a hydrogen explosion shortly after 11 a.m. on March 14. The reactor's cooling function equipped with the reactor's pre-warning device was believed to have been still operative for some time after the loss of its power source.

As part of precautionary measures against severe accidents, power operators are required to take steps even if there is a low possibility of incidents that would induce such accidents. In the Fukushima nuclear disaster, emergency diesel generators lost electricity due to the tsunami. No one had projected a situation in which all emergency power generators could not be used for many hours.

Tadashi Yoshida, a professor of reactor engineering at Tokyo City University, said, "No one, including myself, ever imagined all emergency power generators would be wiped out. We could not imagine this worse-case scenario. We should radically review the design guidelines and the state's

screening process.”

Takeshi Matsuoka, a guest professor of system engineering at Utsunomiya University, said, “In view of the huge damage and social losses from potential consequences, the government should have ordered them to draw up measures even if the chances of electricity loss were low. Members of the Nuclear Safety Commission of Japan and other people in responsible positions have apparently lacked vision to utilize JNES’s knowledge. The respective electric power companies must have had the resources to independently analyze the results of the JNES results.”

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http://mdn.mainichi.jp/mdnnews/national/archive/news/2011/04/19/20110419p2a00m0na014000c.html