

Fukushima: Tepco's nuclear accident manual "useless" and other stories

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Fukushima plant crisis could erupt if water injection stops for 38 hrs

TOKYO (Kyodo) — Tokyo Electric Power Co. has released an estimate that says if water injection at its stricken Fukushima No. 1 Nuclear Power Plant stops, its fuel rods could start melting in 38 hours, causing radioactive substances to spew out.

The utility said, however, it can resume watering at the Nos. 1 to 3 reactors in three hours at the most in case the plant is hit by another earthquake and tsunami matching the scale of the March 11 disaster that caused their core meltdowns.

The estimate said the temperature of the fuel, now believed to have solidified at the bottom of the reactors' pressure vessels, would rise about 50 C each hour and reach its melting point of 2,200 C in about 38 hours.

The reactors would then start emitting massive amounts of radioactive substances, raising the radiation level around the plant's premises above 10 millisieverts, the benchmark for prompting an order to evacuate.

In the estimate, TEPCO did not assess the likelihood of any melted fuel dropping through the pressure vessels into the containment vessels shrouding each reactor.

In the case any one part of the current system used to pump water into the crisis-hit reactors is lost, TEPCO said it can resume watering in about 30 minutes by activating emergency pumps installed at an elevated position. In the event of multiple functions were lost, the utility projected it would require about three hours to resume injecting water.

TEPCO official Junichi Matsumoto said the utility would inject boric acid if there were a concern of a nuclear chain reaction. But he said the likelihood of such a reaction occurring was small because the condition within the reactors has changed as the fuel was damaged.

Kyodo Press, October 2, 2011

<http://mdn.mainichi.jp/mdnnews/national/news/20111002p2g00m0dm021000c.html>

TEPCO finds own nuclear accident manual useless

TOKYO (Kyodo) — Tokyo Electric Power Co.'s in-house report showed Sunday the utility has found its own emergency manual was useless for handling the crisis at the Fukushima No. 1 Nuclear Power Plant and also repudiated the widely-held belief that a hydrogen explosion might have occurred at its No. 2 reactor.

The report indicated the utility prepared the manual with a view to dealing with nuclear plant accidents including severe incidents on the assumption that emergency power generators, including diesel generators, would work properly to keep reactor cooling systems functioning.

In fact, none of the backup generators worked after the March 11 earthquake and tsunami hit the plant located on the Pacific coast.

According to the report compiled by an intra-company investigative committee, the plant operator first recognized that large explosions had been heard at the No. 2 and No. 4 reactors past 6 a.m. on March 15.

The utility then confirmed that the air pressure in an area near the containment vessel of the No. 2 unit was falling and also that the upper part of the building housing the No. 4 unit had been seriously damaged.

Subsequent analysis of the data led the company to conclude that an explosion had occurred at the No. 4 reactor, but it "erroneously recognized" that something akin to an explosion had possibly taken place at the No. 2 unit, according to the report.

In the accident at the Fukushima plant, the buildings housing the No. 1 and No. 3 reactors were damaged due to hydrogen explosions while that of the No. 4 unit, which was idled for a regular inspection at the time of the natural disasters, was also destroyed. The building of the No. 2 reactor still stands.

Kyodo Press, October 2, 2011

<http://mdn.mainichi.jp/mdnnews/national/news/20111002p2g00m0dm083000c.html>

Fukushima N-response center lost functions

A power loss shut down an off-site emergency response center near the Fukushima No. 1 nuclear power plant for half a day after the Great East Japan Earthquake on March 11, delaying the initial response to the nuclear disaster at the power plant, according to sources.

According to the Nuclear and Industrial Safety Agency, the center lost its external power supply immediately after the earthquake, and an emergency diesel generator stopped operating soon after.

Due to the power loss, agency officials stationed at the center were unable to use important equipment such as monitors that show conditions inside the plant.

The agency, which believes the earthquake caused the generator to break down, had not taken any anti-seismic reinforcement measures to protect the generator, the agency said.

The government panel tasked with investigating the nuclear crisis has begun studying the case, according to the sources.

The off-site center is located in Okumamachi, Fukushima Prefecture, about five kilometers from the nuclear power plant.

Based on the Law on Special Measures Concerning Nuclear Emergency Preparedness, 22 off-site emergency response centers have been set up near nuclear power plants around the nation, including the one in Okumamachi.

In the event of nuclear accidents, the government is to establish local emergency headquarters at the centers, where officials of the central and local governments and power plant operators are to share information about accidents and related information such as the evacuation of residents, and discuss countermeasures.

According to the Nuclear and Industrial Safety Agency and the Fukushima prefectural government, the emergency generator went on when the external power supply was lost immediately after the earthquake occurred at 2:46 p.m.

However, the generator stopped working within about one hour after the earthquake, and the center lost all its functions. The generator was on the first floor of the center.

Agency officials moved to the Fukushima prefectural government's Environmental Radioactivity Monitoring Center next to the off-site center building. The government's local emergency headquarters for the nuclear crisis was established at the response center at about 7 p.m., but the agency officials had to continue working in one of the rooms of the radioactivity monitoring center.

The radioactivity monitoring center became so crowded with people that the activities of the agency officials and Fukushima prefectural government officials were delayed. "We weren't able to perform some of the work that should have been done soon after the earthquake, such as preparing to measure radiation doses," a Fukushima prefectural government official said.

Due to the power loss, officials were unable to use a videoconference system at the center, which connects the center to the central and local governments, and a TV monitor displaying communications between the Fukushima No. 1 nuclear power plant and Tokyo Electric Power Co.'s head office in Tokyo.

At that time, the Nuclear and Industrial Safety Agency in Kasumigaseki, Tokyo, did not have a TV monitor displaying communications between the Fukushima No. 1 plant and TEPCO.

The power was out when Motohisa Ikeda, then senior vice minister of the Economy, Trade and Industry Ministry, arrived at the response center at midnight with senior officials of the Nuclear and Industrial Safety Agency to serve as the chief of the local emergency headquarters.

Sometime after Ikeda's arrival, an electrician determined that a pump sending diesel oil to the generator from a tank placed in the basement was not working due to a faulty switch on the pump's control panel. The electrician fixed the fault, and the center's functions were restored at about 3

a.m. the next day.

According to the agency, the emergency generator has the capacity to provide electricity to the off-site center for two days. The agency did not find any defects in the generator during a periodic inspection in February.

The agency said it had not taken any anti-quake measures for the emergency generator as operational regulations of the Law on Special Measures Concerning Nuclear Emergency Preparedness do not require any. The agency believes the shock of the earthquake caused the generator to break down. The temblor registered in the upper 6 level on the Japanese seismic intensity scale of 7 in areas around the off-center site.

On March 15, the agency ordered officials to evacuate from the center after radiation levels went up due to the repeated hydrogen explosions at the power plant's nuclear reactors and the shortage of water and food. The local emergency headquarters was moved to Fukushima city, about 60 kilometers from the nuclear power plant.

Several other failures of the center to prepare for major earthquakes became evident after the March 11 disaster, such as failing to cover the building with materials to block radiation.

A spokesman of the Nuclear and Industrial Safety Agency said: "Off-site center buildings meet the quake-proofing standards of the Building Standards Law, but we apparently did not pay attention to the earthquake resistance of generators. We deeply regret the inconvenience caused to local residents [near the power plant]." The Nuclear Safety Commission is now discussing matters related to off-site centers, such as the suitability of their locations. We'll take necessary measures on off-site centers after the commission announces its conclusion."

Yomiuri Shimbun , September 27, 2011

<http://www.yomiuri.co.jp/dy/national/T110926005539.htm>

Gov't panel projects TEPCO's compensation to top 4 tril. yen

TOKYO (Kyodo) — A government panel tasked with overseeing Tokyo Electric Power Co.'s financial standing has estimated so far that the utility could face more than 4 trillion yen in compensation costs related to the nuclear crisis at the Fukushima Daiichi power plant, panel sources said Monday.

The third-party panel calculated the figure based on government compensation guidelines, but the amount could increase as discussions are continuing on issues such as how far the plant operator should shoulder the costs to compensate people who have voluntarily evacuated from around the radiation-leaking plant.

The estimate is expected to provide a basis for talks over Tokyo Electric's special operating plan, to be compiled as a condition for the company to seek assistance from a state-backed entity to secure funds to pay the massive amount of compensation.

The panel, headed by lawyer Kazuhiko Shimokobe, has also calculated that the utility, known as TEPCO, could avoid falling into negative net worth without raising electricity bills if it is allowed to

restart nuclear reactors at the Kashiwazaki-Kariwa power plant in Niigata Prefecture next summer.

But it also expected that a rise in electricity charges would become unavoidable if there are delays in restarting the reactors as the likelihood of accumulating liabilities would increase if the restart is pushed back, raising fears that the company could be crushed by debt.

The assessment, however, does not take into account the costs of decommissioning the Fukushima Daiichi plant, crippled since the March 11 earthquake and tsunami, the sources said.

Kyodo Press, September 27, 2011

<http://mdn.mainichi.jp/mdnnews/national/archive/news/2011/09/27/20110927p2g00m0dm011000c.html>

NISA releases safety plan for Fukushima plant after cold shutdown

The Nuclear and Industrial Safety Agency (NISA) for the first time presented a plan to secure the safety of the reactors at the Fukushima No. 1 nuclear power plant after cold shutdown is achieved.

In the plan released by NISA officials on Oct. 3, four major objectives were laid out: limiting and managing the emission of radioactive materials; removing decay heat from the nuclear fuel; preventing criticality in which a nuclear chain reaction continues; and preventing hydrogen explosions.

The agency included 57 measures that must be implemented to achieve those objectives, covering such areas as cooling the reactors and fuel storage pools while maintaining stable operations of purification equipment processing water contaminated with high levels of radiation.

A major reason for the plan is that many current facilities being used to achieve cold shutdown are temporary ones, raising concerns about whether a state of cold shutdown can be continued in a stable manner.

Under the government's road map to settle the Fukushima nuclear accident, the target date for achieving cold shutdown, in which temperatures in the reactors are under 100 degrees and no radioactive materials are being emitted, is next January. That would mark the conclusion of the second step of the road map.

Three additional years are needed between the end of the second step and the start of work to decommission the four reactors at the Fukushima plant, officials said.

Learning a lesson from the nuclear accident triggered by the March 11 Great East Japan Earthquake, the NISA plan calls for at least two different sources of external electric power as well as alternative equipment in the event emergency power sources are lost.

The plan also calls for backup measures to cool the reactors and fuel storage pools.

A recycling cooling system at the Fukushima plant is purifying highly radioactive water and returning it to cool the reactors. However, much of the equipment is temporary and for emergency

use, raising doubts about whether the system can continue operating stably if another earthquake or tsunami causes a blackout.

Officials of Tokyo Electric Power Co., the operator of the Fukushima plant, will have to submit a report to NISA by Oct. 17 on how they plan to continue operating the recycling cooling system.

NISA officials will have to verify the safety of the system before determining if a state of cold shutdown has been achieved.

“There will be a need for an appraisal of the TEPCO report that can reassure the public,” Goshi Hosono, the state minister in charge of the Fukushima nuclear accident, said at an Oct. 3 news conference.

NISA’s plan also includes steps to be taken when removing nuclear fuel from the storage pools as well as installing a temporary fuel storage facility. Such measures are needed because the nuclear fuel rods are believed to have been damaged.

The plan calls for careful work to prevent the spewing of radioactive materials when the fuel rods are removed from the storage pool.

BY JIN NISHIKAWA STAFF WRITER, *Asahi Shimbun*, October 5, 2011
<http://www.asahi.com/english/TKY201110040377.html>

Fukushima nuclear plant moves closer to ‘cold shutdown’

TOKYO (Kyodo) — Tokyo Electric Power Co. said Wednesday all three crippled reactors at its Fukushima Daiichi nuclear power plant have met a key condition in achieving a stable state known as “cold shutdown.”

The utility made the announcement after the temperature reading at the base of the No. 2 reactor pressure vessel at the plant, which has been crippled since the March 11 earthquake and tsunami, fell below 100 C.

Bringing the temperature at the base of each vessel to below 100 C is a key condition for achieving a cold shutdown of the plant. The Nos. 1 and 3 reactor vessels are already below 80 C.

As of 5 p.m., the base of the No. 2 reactor vessel was at 99.4 C, the utility known as TEPCO said.

The government and TEPCO believe that the other condition — reducing the leakage of radioactive substances from the plant — is also about to be met.

According to the road map for containing the nuclear crisis, efforts are currently at the “step 2” phase aimed at achieving a cold shutdown.

To step up restoration efforts, TEPCO has adopted a method of showering water onto the Nos. 2 and 3 reactor cores.

The radiation level around the plant site has fallen to 0.4 millisievert per year, lower than the government-set reference limit of 1 millisievert.

Though the figures indicate that the plant has achieved a cold shutdown, it is “somewhat too early” to make such a judgment as the radiation readings have yet to be confirmed, TEPCO spokesman Junichi Matsumoto said at a press conference.

Kyodo Press, September 29, 2011

<http://mdn.mainichi.jp/mdnnews/news/20110929p2g00m0dm017000c.html>

Diet panel could seek to pin blame in Fukushima disaster

The Diet will set up a panel effectively authorized to clarify responsibility of key individuals in the Fukushima nuclear disaster, such as former Prime Minister Naoto Kan and executives of Tokyo Electric Power Co.

The investigation committee, designed to verify the causes of this unprecedented nuclear accident from a nonpartisan stance, will be made up of 10 private-sector experts.

It will be able to summon politicians, bureaucrats and TEPCO executives, such as Chairman Tsunehisa Katsumata, to testify at the Diet, but only as unsworn witnesses.

The committee will be the first investigation organ of private-sector experts to be set up within the Diet under the Constitution.

Its authority will be endorsed by its governing body, a council of 20 Diet members with parliamentary investigation powers.

The council will be able to call key individuals to give sworn testimony, which means they can be punished if they commit perjury.

In principle, hearings will be conducted in public.

The Diet committee is expected to shed more light on the Fukushima disaster than an existing government committee tasked with verifying the causes of the accident.

The government panel has no legislative backing, nor is it tasked with seeking responsibility of individuals.

It reported the results of hearings with individuals in a closed session on Sept. 27. The panel expects to question an additional 300 people, including Kan, but has no plans to release the results to the public.

The Diet investigation committee was proposed by the opposition Liberal Democratic Party, New Komeito and the Sunrise Party of Japan, which said the government’s in-house investigation will not be sufficient to gain public trust.

The ruling Democratic Party of Japan was initially cool to the proposal but relented because it needed the cooperation of the opposition parties to pass the third supplementary budget through the Diet.

Officials from the DPJ, the LDP, New Komeito and the Japanese Communist Party agreed Sept. 28 to pass related legislation during the current Diet session.

The Diet committee is expected to begin investigations after it is set up during the next extraordinary Diet session.

Critics have expressed concerns that political parties could exploit the investigation panel solely for their political gains.

For example, opposition parties may simply take potshots at the DPJ-led government. The ruling camp could take the opportunity to include LDP's past policies to promote nuclear power generation in the scope of investigations.

In view of those concerns, the ruling and opposition parties agreed on the need to ensure that no doubts are raised about the committee's political neutrality.

The Diet investigation committee's members will be picked by the council of Diet members, which include directors of the committees on rules and administration of both chambers.

A key focus is whether the council will select impartial members. Eight of the 10 experts who sit on the committee will be drawn from among those not specializing in nuclear power and radiology.

It will submit reports to the Lower House speaker and the Upper House president within six months after its establishment.

Asahi Shimbun , September 30, 2011

<http://www.asahi.com/english/TKY201109290261.html>
