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# Japan: Fukushima nuclear plant cleanup may take more than 40 years... if...

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## **Fukushima nuclear plant cleanup may take more than 40 years: IAEA**

A U.N. nuclear watchdog team said Japan may need longer than the projected 40 years to decommission the Fukushima power plant and urged Tepco to improve stability at the facility.

The head of the International Atomic Energy Agency team, Juan Carlos Lentijo, said Monday that damage at the nuclear plant is so complex that it is impossible to predict how long the cleanup may last.

"As for the duration of the decommissioning project, this is something that you can define in your plans. But in my view, it will be nearly impossible to ensure the time for decommissioning such a complex facility in less than 30 to 40 years as it is currently established in the road map," Lentijo said.

The government and Tokyo Electric Power Co. have predicted the cleanup would take up to 40 years. They still have to develop technology and equipment that can operate under fatally high radiation levels to locate and remove melted fuel. The reactors must be kept cool and the plant must stay safe and stable, and those efforts to ensure safety could slow the process down.

The plant still runs on makeshift equipment and frequently suffers glitches.

Just over the past few weeks, the plant suffered nearly a dozen problems ranging from extensive

power outages to leaks of highly radioactive water from underground water pools. On Monday, Tepco had to stop the cooling system for one of the fuel storage pools for safety checks after finding two dead rats inside a transformer box.

Earlier this month, a rat short-circuited a switchboard, causing an extensive outage and cooling loss for up to 30 hours.

Lentijo said water management is “probably the most challenging” task for the plant for now.

The problems have raised concerns about whether the plant, crippled by the March 2011 earthquake and tsunami, can stay intact throughout a decommissioning process. The problems have prompted officials to compile risk-reduction measures and review decommissioning plans.

Lentijo, an expert on nuclear fuel cycles and waste technology, warned of more problems to come.

“It is expectable in such a complex site, additional incidents will occur as it happened in the nuclear plants under normal operations,” Lentijo said. “It is important to have a very good capability to identify as promptly as possible failures and to establish compensatory measures.”

He said Tepco’s disclosures have been problematic and urged the utility to take extra steps to regain public trust.

The IAEA team urged the utility to “improve the reliability of essential systems to assess the structural integrity of site facilities, and to enhance protection against external hazards” and promptly replace temporary equipment with a reliable, permanent system.

AP, April 24, 2013

<http://www.japantimes.co.jp/news/2013/04/24/national/fukushima-nuclear-plant-cleanup-may-take-more-than-40-years-iaea/#.UYOOzpkOj1U>

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## **NRA to open new study on role 3/11 quake played in damaging No. 1 plant**

The Nuclear Regulation Authority decided Wednesday to open a more thorough investigation into whether critical safety equipment at one of the reactors in the Fukushima No. 1 power plant was damaged before the complex was hit by tsunami in March 2011.

The decision was reached by a panel tasked by the NRA to look deeper into the cause of the Fukushima disaster and how it evolved to reconcile the differing conclusions reached by the three accident investigation commissions that probed the disaster.

The commission appointed by the government, which was responsible for nuclear oversight, reported that it was skeptical the magnitude 9.0 earthquake by itself caused the catastrophic damage that caused the cores of reactors 1 to 3 to melt.

The commission appointed by the Diet suggested the quake may have damaged the piping of an emergency cooling system called an isolation condenser at reactor 1. The report said several workers on the fourth floor of the building witnessed a water leak on the same floor, which houses two large tanks used by the isolation condenser and its piping, at the time of the quake.

The now-defunct panel also denied the possibility that the tremors caused radioactive water to slosh out of the spent-fuel pool on the fifth floor, although no on-site inspection has been carried out yet.

The third commission was independent and scathing in its findings.

**Kyodo News**, May 3, 2013

<http://www.japantimes.co.jp/news/2013/05/03/national/nra-to-open-new-study-on-role-311-quake-played-in-damaging-no-1-plant/#.UYTTA0pOj1U>

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## **U.S. officials concerned about Japan's plan to reprocess nuclear fuel**

TOKYO (Kyodo) — Some U.S. government officials and experts have strong concerns about Japan's plan to operate a nuclear fuel reprocessing plant in Aomori to reprocess plutonium while most of the nation's reactors remain shut down, a member of the government's Japan Atomic Energy Commission said Monday.

"It was an unprecedentedly severe reaction," Tatsujiro Suzuki, the commission's vice chairman, told reports after a commission meeting, referring to U.S. officials' comments during his trip to the United States in early April.

"I think this is because the Liberal Democratic Party stands firm to uphold a policy of reprocessing spent nuclear fuel, and also because plans to operate the reprocessing plant are moving forward," Suzuki said.

Arousing U.S. concern is Japan Nuclear Fuel Ltd.'s aim to start operating its fuel reprocessing plant in Rokkasho, Aomori Prefecture, in a full-fledged manner in October.

Japan possesses a large amount of plutonium but prospects for consuming it remain unclear as most of Japan's nuclear reactors are idled amid heightened concerns over the safety of nuclear power after the 2011 Fukushima nuclear crisis.

Since the Rokkasho plant operator needs to meet new regulations of the Nuclear Regulation Authority, it is still unclear when the plant can begin operation.

Suzuki quoted U.S. Assistant Secretary of State Thomas Countryman as saying that if Japan conducts nuclear spent fuel reprocessing while its profitability remains unclear, there is a chance that Japan's international reputation may be significantly damaged.

Countryman was also quoted as saying that Japan's reprocessing work could affect Iran and other countries with nuclear ambitions.

U.S. Deputy Secretary of Energy Daniel Poneman was quoted by Suzuki as saying that he has great concern that Japan may possess a large inventory of plutonium without plans to consume it.

Japan's 10 power companies operating nuclear power plants possessed a total of about 26.5 tons of fissile plutonium as of the end of 2012. Several kilograms of the material are said to be enough to make a nuclear weapon.

**Kyodo News**, April 23, 2013

<http://mainichi.jp/english/english/newsselect/news/20130423p2g00m0dm035000c.html>

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## **Fukushima nuke plant forced to stop cooling system for fuel pools due to dead rats**

The operator of the crippled Fukushima No. 1 nuclear plant said on April 22 it had to temporarily stop a cooling system for a spent fuel pool after finding two dead rats inside a transformer.

According to Tokyo Electric Power Co. (TEPCO), workers patrolling at the site found the dead rats at around 10:15 a.m. on April 22 inside the makeshift transformer which was built after the plant disaster in March 2011. TEPCO had to temporarily stop the cooling system for the No. 2 reactor's spent fuel pool for a cleanup. The cooling system restarted before 4 p.m. on the same day after the company covered a hole that rats apparently entered through.

Just last month the Fukushima No. 1 plant experienced a blackout caused by rats that disabled cooling systems for about 30 hours.

"Fortunately, we didn't have a blackout this time," Toshihiko Fukuda, general manager at TEPCO's Nuclear Quality and Safety Management body, told a news conference. "We'll continue our inspection around the plant to eliminate any problems," he said.

In addition, TEPCO said it finished transporting radioactive water from the No. 2 underground tank, which was found to be leaking earlier this month, to another cistern above ground before noon on April 22. The amount of water that was transported was 1,070 cubic meters. The company plans to start moving radioactive water from the No. 1 water tank as well.

*Mainichi Shimbun*, April 23, 2013

<http://mainichi.jp/english/english/newsselect/news/20130423p2a00m0na021000c.html>

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## **Claims against Tepco can run long**

The Cabinet endorsed a bill Tuesday that would allow people affected by the Fukushima nuclear crisis to seek damages from Tokyo Electric Power Co. after the statute of limitations runs out after three years.

Only half of around 6,000 damages claims have been concluded despite the efforts of a government organization to mediate settlement talks between victims and Tepco.

Because some cases may become invalid after next March, the third anniversary of the disaster, the government compiled the bill to allow people to file damages suits within one month after their settlement talks break down.

**Kyodo News**, April 24, 2013

<http://www.japantimes.co.jp/news/2013/04/24/national/claims-against-tepco-can-run-long/#.UYONxkpOj1U>

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### **TEPCO shuts down cooling system for spent nuclear fuel pool at Fukushima plant**

Tokyo Electric Power Co. (TEPCO) said it temporarily shut down the cooling system for a spent nuclear fuel pool of the No. 3 reactor at the Fukushima No. 1 Nuclear Power Plant at 9:39 a.m. on April 25 to install a multiplex power distribution system there.

TEPCO, the operator of the crippled Fukushima nuclear power station, said the cooling system was expected to remain shut for about 33 hours. While the cooling system is offline, the temperature of the water in the spent nuclear fuel pool is likely to rise about five degrees Celsius. But TEPCO said, "There is no problem. The water temperature was low enough at 16 degrees when it was shut down." The utility also said it would shut down the cooling system for the spent nuclear fuel pool at the No. 4 reactor for about nine hours on April 26 in order to conduct similar installation work.

In March this year, a power outage, triggered by a rat that touched a switchboard and caused a short circuit, disabled cooling systems for the spent fuel pools of the No. 1, 3 and 4 reactors. It took nearly 30 hours for the cooling systems to be fully recovered. The Nuclear Regulation Authority instructed TEPCO to take preventative measures promptly, including installing multiplex power distribution systems, among other measures.

*Mainichi Shimbun*, April 25, 2013

<http://mainichi.jp/english/english/newsselect/news/20130425p2a00m0na011000c.html>

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### **Fukushima safety monitoring body says TEPCO's handling of radioactive water 'sloppy'**

FUKUSHIMA — The Fukushima Prefectural Government's council to monitor the process of decommissioning the crippled nuclear power station described Tokyo Electric Power Co. (TEPCO)'s handling of radioactive water as "sloppy" after inspecting underground storage tanks on April 24 that were found to be leaking earlier this month.

After inspecting the three troubled underground storage tanks at the Fukushima No. 1 Nuclear Power Plant, the council tasked with monitoring safety involved with the decommissioning of the crippled atomic power station said, "It requires sophisticated supervision to store contaminated water. The work is sloppy." It is the first time that an on-sight inspection of the underground tanks has been disclosed to the media since the leakages of radioactive water came to light.

The council was established in December last year to monitor the process of decommissioning the crippled nuclear power complex. It consists of officials from 13 municipalities around the nuclear plant in Fukushima Prefecture and experts on handling of radioactive waste and other fields. On April 24, council members inspected how the piping system for the tanks was checked for safety as well as the area around leakage detecting holes on the Nos. 1 to 3 underground storage tanks. The leaky tanks are among seven underground cisterns at the nuclear complex. The council members

also inspected above-ground storage tanks to which radioactive water had been and would be transferred from the troubled underground storage tanks.

On the innermost “bentonite” sheet (6.4 millimeters thick) of the three-layered sheets covering the underground storage tanks, Susumu Nakamura, a council member and professor at Nihon University, said, “The leakages could have been prevented if it had been 50 centimeters to 1 meter thick.”

*Mainichi Shimbun*, April 25, 2013

<http://mainichi.jp/english/english/newsselect/news/20130425p2a00m0na013000c.html>

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## **Steps to halt increase of radioactive water at Fukushima plant studied**

TOKYO (Kyodo) — A government-appointed panel of experts on Friday started studying ways to prevent more radioactive water from accumulating at the Fukushima Daiichi nuclear power plant, including a plan to embed walls around the damaged reactor buildings to stop groundwater from entering.

About 400 tons of groundwater seep into the plant every day, flowing into the lengthy and complicated water circulation loop that keeps the plant’s damaged reactors cool. In the process, the groundwater becomes contaminated.

Plant operator Tokyo Electric Power Co. has so far dealt with the situation by increasing the number of water storage tanks at the site. It has also built a dozen wells to pump out part of the groundwater that enters the reactor buildings as it flows from the mountainside to the ocean-side.

But the panel, also joined by officials of the government and TEPCO, hopes to find a more fundamental solution because the utility could eventually run out of water storage capacity.

Some proposals were presented during the meeting of the panel members Friday, such as building an underground wall around reactor buildings by using a clay-like material.

TEPCO once considered building a wall on the mountain side of the reactor building after the plant was crippled by a huge earthquake and tsunami in March 2011, but it abandoned the idea because of the risk that contaminated water accumulating inside the reactor buildings could flow onto the soil outside.

The problem of keeping massive amounts of radioactive water at the plant has recently drawn renewed attention after TEPCO found some underground water storage pools containing contaminated water had leaked and had to find a secure storage space.

**Kyodo News**, April 27, 2013

<http://mainichi.jp/english/english/newsselect/news/20130427p2g00m0dm007000c.html>

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## **Monitoring hole samples around crippled nuclear complex contain radioactive elements: Tepco**

Samples of groundwater taken from monitoring holes around the sunken reservoirs at the Fukushima No. 1 nuclear plant are proving radioactive, Tokyo Electric Power Co. said Saturday.

Strontium and other radioactive elements were detected in samples taken from 13 of the 22 observation holes dug around the reservoirs, which were built to hold water tainted during the cooling of the reactors, Tepco said.

Some of the reservoirs are leaking.

The amount of radioactive material in the samples is small and within the range of normal fluctuations, Tepco said, but it is not known whether there is any link between the radiation and the reservoir leaks.

The utility said that 0.03 to 0.048 becquerels per milliliter of the radioactive materials was detected in Friday's groundwater samples. A similar amount was detected in water taken from two holes when the utility reanalyzed the samples to confirm the previous readings.

The observation holes range from 5 to 15 meters deep.

**Jiji Press**, April 27, 2013

<http://www.japantimes.co.jp/news/2013/04/27/national/groundwater-at-no-1-plant-tainted/#.UYR47UpOj1U>

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## **TEPCO begins preparing to transfer contaminated water at stricken Fukushima plant**

Tokyo Electric Power Co. on April 15 began preparing to move radioactively contaminated water from underground reservoirs at the crippled Fukushima No. 1 Nuclear Power Plant to storage tanks on the ground.

The move follows the recent discovery of leaks from three of the reservoirs, whose cause remains to be confirmed. It is expected to take until June to transfer all of the contaminated water, leaving the plant at risk of further leaks over the next two months.

TEPCO has seven reservoir tanks, each with the same design, at the plant. So far leaks have been confirmed at the No. 1-3 tanks, which as of April 12 held 6,000, 1,100 and 8,400 cubic meters of contaminated water, respectively. The No. 4 and No. 6 reservoir tanks respectively hold 3,000 and 8,100 cubic meters of water, while the No. 5 and No. 7 reservoir tanks are not in use.

The utility plans to prioritize the transfer of contaminated water from the No. 1 and 2 reservoir tanks, where relatively large leaks were detected, hoping to complete the work by around the Golden Week holiday period in May. On April 15, the company set up temporary piping and pumps and began preparing to pump water from the No. 2 reservoir tank to a storage tank on the ground about 200 meters away. It plans to move 1,400 cubic meters of tainted water from the No. 1 reservoir tank to a storage tank on the ground, and another 4,600 cubic meters to a filtrate tank. The company expects to complete transfers of contaminated water from the No. 3, 4 and 6 reservoir tanks by around June.

At first TEPCO said that if it didn't use the underground reservoirs, then it would find itself short of space to store radioactively contaminated water, and that it planned to continue using the seven underground reservoir tanks. However, as the threat of further leaks loomed, the Fukushima Prefectural Government and other parties have asked the company to move the water to storage tanks above ground.

*Mainichi Shimbun*, April 15, 2011

<http://mainichi.jp/english/english/newsselect/news/20130415p2a00m0na013000c.html>

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## **Radioactive water set to be shifted to aboveground tanks soon: TEPCO**

Tokyo Electric Power Co. (TEPCO) has announced that the transfer of radiation-tainted water in underground reservoirs to aboveground tanks at the Fukushima No. 1 Nuclear Power Plant is to start on April 16 at the earliest — a couple of days behind the initial schedule.

The measures come following a string of leakages of radioactive water from the No. 1 through No. 3 cisterns out of seven underground reservoirs at the crippled nuclear plant. The No. 4 and No. 6 cisterns — whose structures are the same as those of the leaking reservoirs — also contain tainted water.

The transfer of tainted water — which had originally been scheduled to start on April 14 — will begin as soon as the method's safety is confirmed during final checks on April 16.

TEPCO explained on April 15 that the planned water transfer was delayed due to a leakage of contaminated water from pipes during work to transfer water from the No. 3 cistern to the No. 6 cistern underground on April 11, which required "unexpected inspections."

"Even though the start (of the water transfer) was delayed, it won't affect the planned completion of the transfer (in June)," said TEPCO spokesman Masayuki Ono.

Regarding the reason why a power outage took place on April 5 during work to set up metal wire to ward off small animals from a power supply system for the spent nuclear fuel pool of the No. 3 reactor, which suspended the cooling system for about three hours, TEPCO explained that a piece of wire sticking out from the metal wire touched the terminal of a switchboard, shorting out and charring both the wire and the terminal.

"The fact that power had not been turned off before the work is partly to blame. We will strive to prevent a recurrence," TEPCO said.



The metal wire was set up following another earlier power outage in March believed to have been triggered by a rat that touched a switchboard, disabling cooling systems for spent fuel pools at the nuclear complex.

*Mainichi Shimbun*, April 16, 2013

<http://mainichi.jp/english/english/newsselect/news/20130416p2a00m0na014000c.html>

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## **Fukushima gov't forced to reveal children's thyroid gland tests**

FUKUSHIMA — The Fukushima Prefectural Government has been forced to reveal children's thyroid gland tests to an NPO after earlier refusing to release the results carried out following the Fukushima nuclear disaster, it has been learned.

The prefectural government had previously insisted that making the results public would be an invasion of privacy. However, under a prefectural ordinance on the release of information to the public, the data did not qualify to be withheld, forcing the prefectural government to release it.

The data covers ultrasound tests for lumps and other abnormalities, with four levels of diagnoses. The results are listed by municipality for 38,114 children tested in the 2011 fiscal year. The data was put together in April last year by Fukushima Medical University, which is charged with conducting the tests.

Yukiko Miki, president of the NPO Access-Info Clearinghouse Japan, demanded the release of the results in December last year, and they were given to the NPO in late January.

Some differences are seen in the results across municipalities. The ratio of children who were diagnosed "B," which meant they had lumps of more than five millimeters and would be subjected to further tests, ranged from 0 to 1.7 percent. The ratio for "A2," which meant they had lumps of under five millimeters, ranged from 25.2 to 41.6 percent.

Professor Toshihide Tsuda of Okayama University, an expert on pollution investigations, says, "Although we cannot say anything for certain based on numbers from a single round of tests, this is important information for looking into the causal relationships between the spread of radioactive material (iodine-131) and the incidence of thyroid gland cancer. The regular release of information is necessary for keeping tabs on health changes."

Regarding the release of the data, a representative for the regional government's department for management of prefectural citizens' health said, "We made our decision based on ordinance rules." The prefectural ordinance on information disclosure says that government documents that could cause misunderstanding or confusion among prefectural residents should not be released, but the thyroid gland test results were judged to fall outside that criteria.

Despite the fact the data was already released to the NPO, at a press conference on Feb. 13, Fukushima Medical University's professor Shinichi Suzuki, who holds responsibility for the tests, refused to reveal the test results, saying "individual areas would be identified (as having higher incidence of lump detection), causing problems for those who were tested."

Mainich Shimbun, April 22, 2013

<http://mainichi.jp/english/english/newsselect/news/20130422p2a00m0na016000c.html>

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### **No radioactive cesium found in any of 10,000 children examined**

TOKYO (Kyodo) — A research team of University of Tokyo and other experts said Wednesday its survey of people who used to live near the crippled Fukushima Daiichi nuclear power plant found no radioactive cesium in any of the 10,000 children 15 years or younger examined after May 2012.

“This shows that chronic internal exposure in Fukushima is very low compared with the case of the Chernobyl nuclear accident in 1986,” said Ryugo Hayano, a member of the research team and University of Tokyo professor.

“Food inspections at markets appear to be working well,” he added.

The research team checked 32,811 people — residents of Fukushima and neighboring Ibaraki Prefecture and those who evacuated to other prefectures — for the internal presence of radioactive substances. The team used whole body counters at a hospital in the village of Hirata, Fukushima Prefecture, from October 2011 to November 2012.

Radioactive cesium was found in about 1 percent of the people surveyed after March 2012, compared with 15 percent in November 2011.

Radioactive materials taken in shortly after the Fukushima Daiichi plant disaster in March 2011 are believed to have already left the body in many cases, while improvements in food inspection methods are also considered to have been effective in eliminating contaminated food.

The survey found no specific relationship between the degree of exposure and land contamination.

The minimum detection level for the whole body counters is 300 becquerels.

**Kyodo News**, April 11, 2013

<http://mainichi.jp/english/english/newsselect/news/20130411p2g00m0dm030000c.html>

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### **Nuclear body OKs new safety standards for serious accidents**

TOKYO (Kyodo) — Japan’s Nuclear Regulation Authority decided Wednesday on a new set of safety standards to tackle serious accidents in the event of earthquakes and tsunamis, which could affect the reactivation of the country’s reactors.

The NRA will solicit public comments on the standards as well as other regulations including a process to give exceptional extension to reactors operating more than 40 years, as the country continues to grapple with the disastrous March 2011 earthquake and tsunami.

Public opinion will be courted for 30 days from Thursday and could be reflected in the standards which will be enforced from mid-July.

The new standards will replace the current guidelines that proved insufficient in the wake of the Fukushima nuclear crisis triggered by the 2011 disaster.

The implementation of those standards is a major precondition for Japanese power companies to apply for government permits to put their idled reactors back online. Amid heightened concerns over nuclear safety, only two reactors in Japan are currently operating.

As a new safety requirement, the NRA calls on operators to install filtered venting systems that can reduce the amount of radioactive substances and lower the pressure inside a reactor container during emergencies. The Fukushima Daiichi complex had venting systems but not with radiation-screening filters.

Earthquake-tsunami countermeasures will undergo a drastic change with a ban on building reactors on active faults and reassessment of the timeframe of active faults.

At present, active faults are defined as those that have moved in the last 130,000 years, but the NRA will move the benchmark to 400,000 years ago. Countermeasures for volcanic eruptions were also drawn up.

The nuclear body said a special safety inspection process for reactors running beyond 40 years will be in place, targeting one reactor at Japan Atomic Power Co.'s Tsuruga plant in Fukui Prefecture and two at Kansai Electric Power Co.'s Mihama plant, also in Fukui.

Japan has decided to limit the operation of reactors to 40 years in principle, but an exceptional extension of no more than 20 years is allowed when safety requirements are met.

The NRA has also revised nuclear disaster mitigation guidelines which would pave the way for a briefing by local governments to residents and prior distribution of iodine tablets. Doctors will explain when to take the pills and their side effects at the briefing.

The revised guidelines state that iodine tablets will be given to people living within a 5-kilometer radius of a nuclear power plant so that they can promptly take the tablets after an accident occurs.

The iodine tablets will help prevent thyroid cancer in the event of exposure to radioactive iodine. Explanatory notes on safety precaution will be handed down to residents, while doctors will check if they suffer from any allergies.

Local governments will also prepare spare iodine tablets for residents who lost them.

In principle, tablets are to be offered at schools, public halls and other facilities after those outside the 5-kilometer radius start evacuation, but if this proves difficult, the pills can be distributed in advance.

Under the revised anti-disaster guidelines, an emergency radiation monitoring center will be set up where local and central governments as well as power companies will gather when an accident breaks out.

**Kyodo News**, April 11, 2013

<http://mainichi.jp/english/english/newsselect/news/20130411p2g00m0dm027000c.html>

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## **TEPCO to remove all radioactive water from troubled tanks by June**

TOKYO (Kyodo) — The operator of the crippled Fukushima Daiichi nuclear power plant on Wednesday unveiled a plan to transfer all the highly radioactive water stored in underground tanks to more reliable containers by the end of June to address the risks of further leaks.

Three of the seven underground tanks have been found to be leaking, and operator Tokyo Electric Power Co. has decided to empty not only those three but another tank as well. The tanks are used to store water for cooling reactors which experienced meltdowns during the 2011 nuclear crisis at the plant. A total of 23,600 tons of liquid will be pumped out by June.

Two of the tanks are not in use, and TEPCO said it will also eventually remove about 3,000 tons of water held in the remaining tank, which is much less contaminated because that water has not been used to cool the crippled reactors.

TEPCO said it came up with the plan because the utility found it can secure enough alternative storage capacity at the site, such as by using existing containers that have room for the water and by installing new tanks.

Economy, Trade and Industry Minister Toshimitsu Motegi told a parliamentary committee earlier in the day that TEPCO should eventually stop using the underground tanks after swiftly removing the contaminated water.

The situation regarding the radioactive water leaks has been worsening since TEPCO earlier this month disclosed the damage, with the number of underground cisterns with problems increasing.

There is speculation there may have been some flaws in the construction process of the containers, all seven of which were built by Maeda Corp.

TEPCO also said it confirmed a small amount of radioactive substances outside the water-containment sheets laid between the No. 1 tank, the latest container found with leaks, and the soil.

At the Fukushima plant, a massive amount of radioactive water is accumulating as a result of continuing water injections into the Nos. 1 to 3 reactors, which experienced meltdowns.

Water once used to cool the damaged reactors is recycled as coolant after radioactive cesium has been removed in a water-processing facility. But the total amount of contaminated water is increasing because the existing water flow allows an influx of about 400 tons of groundwater a day.

To reduce the risk of keeping a massive amount of polluted water at the plant's premises, TEPCO plans to install a new water treatment system capable of reducing various radioactive substances in addition to cesium to an undetectable level.

TEPCO started a trial run of the system in late March, but it will take at least about four months before shifting to full operation, officials said.

To enhance oversight at the plant, which has also recently seen the suspension of its cooling system for spent fuel pools, the Nuclear Regulation Authority said it has decided to increase the number of

inspectors at the plant from eight to nine.

NRA Chairman Shunichi Tanaka said during a meeting of regulatory commissioners Wednesday that TEPCO needs to remake its long-term plan for handling radioactive water.

“What is most important is to take measures so that the situation outside the plant’s premises will not be affected,” Tanaka said.

**Kyodo News**, April 11, 2013

<http://mainichi.jp/english/english/newsselect/news/20130411p2g00m0dm031000c.html>

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## **Radioactive water leak from pipe confirmed at Fukushima plant**

TOKYO (Kyodo) — Another radioactive leak was detected at the crippled Fukushima Daiichi nuclear power plant on Thursday while workers were pumping out contaminated water from one of the troubled underground tanks, Tokyo Electric Power Co. said.

Around 22 liters of radioactive water has leaked from a junction of the piping for transferring liquid, not from the tanks themselves. The water seeped into the soil covering the upper part of the tank, but has not spread outside the site, TEPCO said.

The incident occurred only a day after the utility announced a plan to remove all the highly radioactive water stored in the underground tanks to more reliable containers by the end of June to address the risk of further leaks from the tanks.

TEPCO spokesman Masayuki Ono told a press conference that it will not take long to solve the piping problem and the overall plan to transfer more than 20,000 tons of water is unlikely to be significantly affected.

The leak in the piping was detected only minutes after workers started transferring the content of the No. 3 tank to the No. 6 tank on Thursday afternoon. It was the first time that the equipment in question was used, Ono said.

Up to 6.4 billion becquerels of radioactive substances are estimated to have seeped into the ground, but TEPCO plans to remove the soil in the area.

TEPCO has seven underground tanks and some of them store part of the huge amount of radioactive water resulting from continuing water injections into the Nos. 1 to 3 reactors, which experienced meltdowns during the 2011 nuclear crisis.

The water in the underground tanks has passed through a water-processing facility for the removal of cesium, but it is still contaminated with other radioactive substances.

Three of the tanks have already been found to be leaking and TEPCO plans to eventually stop using the cisterns.

To determine the cause of the leaks, TEPCO has started work to visually check the condition of the No. 2 tank, which was the first found to be leaking radioactive water.

**Kyodo News**, April 11, 2013

<http://mainichi.jp/english/english/newsselect/news/20130411p2g00m0dm076000c.html>

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### **Leaky cisterns to be emptied ASAP**

NARAHARA FUKUSHIMA PREF. — Tokyo Electric Power Co. plans to remove all of the highly radioactive water from sunken reservoirs at its Fukushima No. 1 nuclear plant by early June, the utility's president said after Tepco said at least three of the seven cisterns are leaking.

Tepco will build more above-ground tanks to transfer the tainted water to, and the process will be completed as soon as early June, President Naomi Hirose said Wednesday at the firm's office in Naraha, Fukushima Prefecture.

It was the first news conference Hirose has held since Tepco announced on April 5 that radioactive water had leaked from one of the sunken reservoirs at the crippled nuclear plant.

Hirose apologized for the leaks, adding he is especially sorry for evacuees who had been planning to return to their homes.

On Wednesday, Tepco started removing soil from the area around reservoir No. 2, where the leaks were first discovered, to identify the cause of the problem. All seven cisterns are triple lined, have coamings that keep their edges higher than the ground around them, and have surface coverings.

Hirose said Tepco is unlikely to use the sunken reservoirs again, even though it previously said it would keep using some.

Tepco plans to start transferring a total of 7,100 tons of tainted water stored in reservoirs No. 1 and 2 to above-ground tanks Sunday and complete the transfer in early May.

**Jiji Press**, April 12, 2013

<http://www.japantimes.co.jp/news/2013/04/12/national/leaky-cisterns-to-be-emptied-asap/#.UWpxzkrS-gM>

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### **TEPCO yet to nail down cause of radioactive leaks at Fukushima plant**

TOKYO (Kyodo) — The operator of the crippled Fukushima No. 1 Nuclear Power Plant said Friday it has failed to find out why radioactive water leaked from underground tanks during visual checks of an area suspected to have been the cause of the incidents.

Workers removed part of the soil covering one of the troubled tanks and checked an area where a leak detection pipe, installed close to the tank, pierces through a water-containment sheet. But they could not find any irregularities there, plant operator Tokyo Electric Power Co. said.

“We have no choice but to think that the leakage occurred at another place in the case of the No. 2 tank,” TEPCO spokesman Masayuki Ono said at a press conference, while noting that junctions of water-containment sheets located around the tank could be seen as other suspicious areas.

But he added that even if there are holes in the water-containment sheets, they are unlikely to be large because the amount of water accumulating inside the pipe has been small.

To contain contamination caused by the leaks, TEPCO is collecting the polluted water that has flowed into the pipe and returning it to the tank again.

Workers cannot go inside the 6-meter-deep tank to directly find out the cause partly because it is contaminated with radioactive substances, according to Ono.

**Kyodo News**, April 13, 2013

<http://mainichi.jp/english/english/newsselect/news/20130413p2g00m0dm053000c.html>

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