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Fukushima Daiichi Status Report

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The IAEA issues regular status reports to the public on the current status of the Fukushima Daiichi Nuclear Power Plant, including information on environmental radiation monitoring, the status of workers, and current conditions on-site at the plant.

The information cited in this report is compiled from official Japanese sources, including the Ministry of Economy, Trade and Industry (METI), the Nuclear and Industrial Safety Agency (NISA), the Ministry of Education, Culture, Sports, Science and Technology (MEXT), the Ministry of Land, Infrastructure, Transport and Tourism (MLIT), the Ministry of Health, Labour and Welfare (MHLW) and the Ministry of Foreign Affairs (MOFA) through the Japanese Permanent Mission in Vienna and the Cabinet's Office of the Prime Minister. Information is also provided by the Tokyo Electric Power Company (TEPCO), the operator of the Fukushima Daiichi Nuclear Power Plant.

Questions on the information provided in this report may be directed to info@iaea.org.

What are the recent developments at the Fukushima Daiichi nuclear power plant?

On 17 November an updated version of the “Roadmap Towards Restoration from the Accident at Fukushima Daiichi Nuclear Power Station, TEPCO” [document](#) was released. The significant updates and changes that are mentioned in this updated document (many of which have been discussed in previous status summary updates) include, though they are not limited to, the following:

- Desalination equipment for the Spent Fuel Pool at Unit 2 is currently being prepared and planning for desalination of the Spent Fuel Pool at Unit 3 is underway;
- Approximately 161,580 tons of accumulated water has been treated onsite as of 4 November;
- On 28 October installation work for the (tsunami) water shield wall began. Land surveys and boring for construction activities are on-going;
- The building cover for the Unit 1 Reactor Building was completed on 29 October;
- Approximately 28000 m³ of debris has been cleaned up onsite. 6000 m³ of that debris is stored in waste containers onsite;
- Debris removal from the upper part of Unit 3 and Unit 4 is still on-going;
- The primary containment vessel (PCV) gas control system at Unit 2 began operation on 28 October;
- Installation work for PCV gas control system for Units 1 and 3 is on-going;
- Xenon was detected within the PCV gas control system at Unit 2. The measured xenon was in very low concentrations and based on TEPCO's calculations it was concluded that the measurement corresponded with xenon production via spontaneous fission of Cm-242 and Cm-244 and not a criticality event;
- The dose to someone at the site boundary is currently estimated to be 0.1 mSv/yr. The estimate is based on the current rate of material being released from Units 1-3, i.e., excluding all previously released material;
- On 8 November a model decontamination project has begun in the restricted area;
- TEPCO has been providing personnel to support the government's decontamination efforts in municipal environments as of 8 November;
- As of 1 November 20 onsite rest stations have been established covering 4750 m² and capable of supporting 1600 people;
- As of 8 November workers have been allowed to work without a full facemask and instead with a partial facemask in select locations; and
- As of 1 November workers onsite have been given flu vaccinations.

Table 1: Status of Cooling Water Flow, Temperatures and Pressure at Units 1, 2 and 3

TEPCO's Fukushima Daiichi nuclear power plant station reactors 1, 2 and 3 require circulating water to remove heat from their fuel.

Plant operators are working to bring the reactors into a "cold shutdown condition" defined by TEPCO and the Nuclear Emergency Response Headquarters as:

- 1) Lowering the coolant water temperature to below 100 degrees centigrade while reducing the pressure inside the reactor vessels to the same as the outside air pressure, or 1 atmosphere (atm); and
- 2) Bringing release of radioactive materials from primary containment vessel under control and reducing public radiation exposure by additional release (not to exceed 1 mSv/year at the site boundary as a target).

Indications	Measurement	Reactor		
		Unit 1	Unit 2	Unit 3
Water flow into the reactor ¹	Litres/hour	5500	10000	10500
Reactor vessel pressure	Atm	1.08	1.06	Downscale ²
Outer containment vessel pressure ³	Atm	1.19	1.09	1.02
Reactor vessel temperature (feed water nozzle) ⁴	°C	38.4	55.1	57.7
Reactor vessel temperature (at bottom of reactor) ⁵	°C	39.6	68.9	66.7
Suppression Pool Pressure ⁶	Atm	0.80	Below scale ⁷	1.89
Date/Time of Data Acquisition		23 Nov 03:00 UTC	23 Nov 03:00 UTC	23 Nov 03:00 UTC

Notes

1. Plant operators are pumping water into Unit 1 through one injection point and through two injections points in Units 2 and 3.
2. "Downscale" means the reading is below the lowest indication the instrument is capable of detecting. This is typically an indication that an instrument has somehow failed.
3. The containment vessel completely surrounds the reactor vessel and support systems. It is designed to prevent the release of radioactive materials following an accident. Japanese plant operators are working to reduce the pressure in the containment vessel to 1 atmosphere, the same as the outside air pressure.
4. The temperature of the coolant water as it is pumped into the reactor vessels.
5. The temperature of the coolant water, measured at the bottom of the reactor vessel.
6. The suppression pool is designed to limit pressure in the containment vessel during an accident by condensing steam from the containment vessel. Japanese workers are aiming to get this pressure down to 1 atmosphere.

7. “Below scale” means the reading is below the lowest indication the instrument is capable of detecting. This is typically an indication that an instrument has somehow failed.

Table 2: Most recently reported temperatures in the Fukushima Daiichi Spent Fuel Pools

Spent fuel removed from a nuclear reactor is highly radioactive and generates intense heat. Nuclear plant operators typically store this material in pools of water that cool the fuel and shield the radioactivity. Water in a spent fuel pool is continuously cooled to remove heat produced by spent fuel assemblies.

According to IAEA experts, a typical spent fuel pool temperature is kept below 25 °C under normal operating conditions. The temperature of a spent fuel pool is maintained by constant cooling, which requires a constant power source.

Location	Water Temperature	
	Temperature °C	Date measured
Unit 1	17.0	23 November
Unit 2	17.7	23 November
Unit 3	18.2	23 November
Unit 4	25.0	23 November
Unit 5	21.6	23 November
Unit 6	23.0	23 November
Common Spent Fuel Pool	21.0	23 November

Latest protective measures for the public

On 17 November METI released an [updated version](#) of the “Roadmap for Immediate Actions for the Assistance of Residents Affected by the Nuclear Incident”. The main updates added to the document include, though they are not limited to, the following points:

- As of 16 November the current numbers for the second round of temporary access has totalled 17337 households amounting to 40622 people being granted permission to travel to their homes by private car or by bus;
- As of 4 November 2094 households from Fukushima Prefecture have moved into their new homes (or been assigned new homes). Nationwide 16931 households have moved or been assigned new homes. Both figures include those displaced by the nuclear accident and those displaced by the earthquake and tsunami;
- As of 10 November 126 cattle remain in the deliberate evacuation zone out of the approximately 9300 that were originally located in the zone. As of 26 August, arrangements to protect 302 dogs and 190 cats have also been made;
- As of 7 November 7 elementary, junior high and high schools have resumed their normal lessons at the original school buildings located in Minamisoma City;
- In-depth monitoring of roadways, well water, rivers and other key infrastructure located within the previously designated evacuation prepared areas in case of emergency is on-going;
- On 29 October the Ministry of the Environment presented the “Basic Concept of the Interim Storage Facility Required for Handling of Environmental Pollution by Radioactive Materials Associated with TEPCO’s Fukushima Dai-ichi NPS Accident”. The general concept is that temporary storage sites will be established in each municipality or community. The location

of the interim storage facility will be decided by end of fiscal 2012. The final disposal site will be located outside Fukushima Prefecture;

- As of 7 November in-depth monitoring of the sites to be decontaminated has started;
- On 11 November the basic policy pursuant to the Act on Special Measures Concerning Handling of Radioactive Pollution was decided by the Cabinet as a policy for determining basic direction for addressing environmental contamination by the released radioactive materials resulting from the accident;
- On 8 November in-depth monitoring of Okuma Town began as part of the model decontamination project targeting locations in the restricted area;
- As part of the selection process for the decontamination technologies to be tested, 25 companies out of 305 applicants were selected on 9 November to participate in a validation test of their techniques and technologies. The testing process is being performed in a prompt manner;
- As of 31 October more than 230000 people have been screened for contamination – not a single case of adverse health effects has been found in the population;
- On 9 October the Fukushima Medical University Hospital began screening residents under the age of 18 for thyroid cancer as part of a preliminary survey. As of 31 October 2485 residents have been screened at the hospital. A mobile thyroid examination process began on 14 November;
- Fukushima Prefecture is now supporting a loan program for the distribution of personal dosimeters to children and pregnant women (approximately 300000 people). The number of dosimeters planned to be distributed within the 47 municipalities is approximately 230000;
- On 16 November MEXT updated the “Dose Rate Map” and the “Accumulated Dose Estimation Map”;
- The Ministry of Agriculture, Forestry and Fisheries is currently conducting air dose rate monitoring of the surrounding forests with an expected completion date for their surveys in February 2012; and
- On 20 October MEXT released their plans for future sea water and sea soil monitoring.

The updated document also includes information released on job creation activities, support to small and medium sized businesses and financial assistance measures that have been and will continue to be given. A summary is also [available online](#).

What is the latest information regarding radiation monitoring of foodstuffs?

Food monitoring data were reported from 16 to 19 November by the [Ministry of Health, Labour and Welfare](#) for a total of 3415 samples collected on 25, 27, 29-31 October and from 1-18 November in 34 different prefectures (Aichi, Akita, Aomori, Chiba, Fukui, Fukushima, Gifu, Gunma, Hokkaido, Hyogo, Ibaraki, Ishikawa, Iwate, Kagoshima, Kanagawa, Kyoto, Mie, Miyagi, Nagano, Niigata, Okayama, Osaka, Saga, Saitama, Shiga, Shimane, Shizuoka, Tochigi, Tokyo, Tottori, Toyama, Wakayama, Yamagata, Yamanashi).

These comprised samples of various vegetables and vegetable products, fruit and fruit products, wild and refined tea leaves, mushrooms, nuts, cereals, dairy products, meat, eggs, fish and seafood. Analytical results for 3399 (over 99.5%) of the 3415 samples indicated that Cs-134 and Cs-137 or I-131 were either not detected or were below the regulation values set by the Japanese authorities. However, 16 samples were above the regulation values for radioactive caesium (Cs-134 and Cs-137), as follows:

- As reported on 16 November, one sample of unpolished rice (unknown date of collection) in Fukushima prefecture, two samples of mushrooms collected on 13 and 15 November in Miyagi and Ibaraki prefectures, respectively, and four samples of fish and seafood sampled on 14 November in Fukushima prefecture;
- As reported on 17 November, one sample of mushrooms collected on 16 November in Chiba prefecture; and

- As reported on 18 November, one sample of refined tea leaves collected on 9 November in Saitama prefecture, six samples of mushrooms collected on 10, 15, 16 and 17 November in Fukushima prefecture, and one sample of dried dokudami (herb) sampled on 14 November in Fukushima prefecture.

Food restrictions

Updated information on food restrictions were reported by the Ministry of Health, Labour and Welfare (MHLW) on 18 November indicating that restrictions were implemented on the distribution of rice (produced in 2011) in certain parts of Fukushima prefecture and for the distribution of log-grown shiitake mushrooms (outdoor cultivation) in certain parts of Chiba prefecture.

Resources Available

TEPCO has posted a page on their [website](#) listing all of the video material they have posted between March and 30 September. These videos will remain available online until the end of December after which they may be removed.

The IAEA will continue to issues regular status reports to the public on the current status of the Fukushima Daiichi Nuclear Power Plant.

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