IAEA

International Atomic Energy Agency

Atoms for Peace

Fukushima Daiichi Status Report

27 October 2011

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 is the situation regarding evacuation areas and protective measures for the public?

Measurements of gamma dose rates are being taken continuously at fixed reference locations in each Japanese prefecture. Since 13 March, the dose rates generally show a decreasing trend. The current rate of this decrease is small due to fact that short half-life radionuclides have decayed.

Japanese authorities have compiled data on the concentrations of radioactive caesium on the ground surface at roughly 2,200 locations within approximately 100 kilometers from the Fukushima Dai-ichi nuclear plant. These studies have been conducted by measuring air dose rates and collecting soil samples. More information on these studies and distribution maps of radiation doses can be found in this 30 August report "*Corrections to the Readings of Airborne Monitoring Surveys (Soil Concentration Map) based on the Prepared Distribution Map of Radiation Doses*," available at:
http://radioactivity.mext.go.jp/en/1270/2011/08/1270_083014-2.pdf

On 30 September, the Nuclear Emergency Response Headquarters lifted the restriction of the '*Evacuation Prepared Areas in Case of an Emergency*.' Current evacuation areas are shown in this map provided by METI:
http://www.meti.go.jp/english/press/2011/pdf/0930_09b.pdf

Japanese authorities have allowed temporary access to evacuated areas for residents and business owners. Access is provided to allow for retrieval of belongings and is conducted such that proper radiation protection and monitoring measures are taken.

For more details on actions taken by Japanese authorities to assist residents in the area, please refer to the 17 October version of the document "*Roadmap for Immediate Actions for the Assistance of Residents Affected by the Nuclear Incident*," available at:
http://www.meti.go.jp/english/earthquake/nuclear/roadmap/pdf/111017_assistance_02.pdf

Food monitoring collection and data is provided by the Ministry of Health, Labour and Welfare. As of 26 October, current food restrictions are available at:
http://www.mhlw.go.jp/english/topics/2011eq/dl/Instructions1026.pdf

What is the current status of the Fukushima Dai-ichi nuclear power plant?

An important element of TEPCO's "*Roadmap Towards Restoration*" is to use circulating water to remove heat from Units 1-3 at the Fukushima plant. TEPCO has established a system to circulate cooling water through the reactors, treat accumulated water in the affected buildings and reuse water to inject into the reactors. Systems have been established to remove radioactive materials desalinate accumulated water.

On 22 October, TEPCO made available an English-language overview of the "*Effort for treating radioactive accumulated water*" at: http://www.tepco.co.jp/en/nu/fukushima-np/images/handouts_111022_02-e.pdf. (A companion video presentation is available at: http://www.tepco.co.jp/en/news/110311/images/111022_3e.wmv)

TEPCO has reported that the temperatures in the reactor pressure vessels (RPV) of Units 1-3 have stabilized below 100 degrees. Bringing the temperatures below 100 degrees Celsius is an important step in stabilizing the reactors.

In addition to recirculating water to remove heat from Units 1-3, additional measures have been taken by TEPCO to manage the volume of water used to cool the reactors. Large tanks to store contaminated water from the cooling process have recently been set up, and an additional 2800 tons of water storage capacity was installed on 17 September.

Approximately 128,140 tons of accumulated, contaminated water has been processed chemically as of 13 October. This process reduces caesium concentration in the water, improving its suitability for storage and further treatment.

TEPCO has also taken action to reduce the amount of contaminated water entering the ocean. On 28 September, a steel pipe sheet pile was completed at the south side of the intake canal for Units 1-4.

To reduce the dispersion of radionuclides to the environment, a steel superstructure has been constructed to cover Unit 1. The final roof panel was installed on 14 October.

Measures to remove loose debris on-site continue, and approximately 700 container-loads of debris have been gathered and stored as of 17 October.

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

TEPCO's Fukushima Dai-ichi 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).

All data below are provided to the IAEA by Japanese authorities.

Indications	**Measurement**	**Reactor**		
		Unit 1	Unit 2	Unit 3
Water flow into the reactor[1]	litres/hour	4,000	10,000	10,800
Reactor vessel pressure	atm	1.10	1.22	-0.80
Outer containment vessel pressure[2]	atm	1.21	1.22	1.02
Reactor vessel temperature (feed water nozzle)[3]	°C	67.2	72.8	67.8
Reactor vessel temperature (at bottom of reactor)[4]	°C	69.3	77.7	71.6
Suppression Pool Pressure[5]	atm	.95	Below scale[6]	1.88
Date/Time of Data Acquisition		27-Oct 12:00 UTC	27-Oct 12:00 UTC	27-Oct 12:00 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. 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.
3. The temperature of the coolant water as it is pumped into the reactor vessels.
4. The temperature of the coolant water, measured at the bottom of the reactor vessel.
5. 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.
6. "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.

Further information regarding progress on-site is available in the 17 October update "*Roadmap Towards Restoration from the Accident at Fukushima Dai-ichi Nuclear Power Station*," available at: http://www.tepco.co.jp/en/press/corp-com/release/11101703-e.html

What protective measures have been taken for the workers at Fukushima Dai-ichi?
TEPCO has worked to improve working conditions at Fukushima Dai-ichi by increasing the number of rest stations at the work site. In addition, the living environment has been improved through the provision of temporary dormitories, meals, bathing and laundry facilities. TEPCO has constructed and continues to develop an onsite medical facility staffed by doctors and nurses trained in treatment for radiation injuries. This staff and its services are available 24/7 in the event of a medical emergency.

TEPCO preforms regular monitoring of its workers for both internal and external radiation exposure. Workers use industry standard personal dosimeters that provide a reading of how much external radiation each individual has been exposed to throughout the course of their work. Radiation monitoring capabilities continue to be enhanced. One example of these enhanced capabilities is through the installation of an additional 12 whole body counting units since 3 October. Whole body counting units are specialized radiation monitoring units that are used to detect if any radioactive material has been received internally.

What is the IAEA's strategy for strengthening global nuclear safety?

In response to the Fukushima accident, IAEA Member States unanimously approved the *IAEA Action Plan on Nuclear Safety* in September 2011 that sets out a programme of work to strengthen the global nuclear safety framework. These actions require a concerted effort from the IAEA Member States and the IAEA Secretariat for the coming years. A dedicated Action Plan Team is now implementing measures set out in the *Action Plan*.

To learn more about the *Action Plan*, please visit:
http://www.iaea.org/About/Policy/GC/GC55/Documents/gc55-14.pdf

How has the IAEA responded to the Fukushima accident?

In the event of a large-scale radiation emergency, the IAEA's role is to provide prompt notification of the event to its member states and international organizations, coordinate international assistance upon request of the accident state and disseminate accurate and timely public information on the accident.

The IAEA conducts these activities primarily through its Incident and Emergency Centre (IEC), a 24-hour round-the-clock response centre based at IAEA headquarters in Vienna. The IEC was activated on 11 March in the hours following the Japanese earthquake and tsunami and established contact with the IAEA's emergency counterpart in Japan, the Nuclear and Industrial Safety Agency (NISA).

Upon activation, the IEC 1) began to distribute information on the accident status to the IAEA's 151 member states and several international organizations, 2) offered emergency assistance to Japan, and 3) provided continuous updates on the accident status via the IAEA website and other communications channels.

Since March 11, the IAEA instituted several measures to assist Japan through arrangements established by the organization and international nuclear and legal frameworks. Following the accident, the IAEA dispatched several teams of specialized technical missions to Japan to 1) monitor radiation levels throughout the country, including locations around the Fukushima Daiichi nuclear plant, 2) discuss technical issues with the Japanese authorities related to the boiling water nuclear reactor design used at the Fukushima plant, 3) participate in marine radiation monitoring missions off the coast of the Fukushima plant and 4) provide assistance, in coordination with the Food and Agricultural Organization (FAO), on technical issues related to food and agricultural safety.

IAEA Director General Yukiya Amano travelled twice to Japan to express solidarity and full support to the Japanese people, confer with the Japanese government and to survey the damage and current recovery efforts at Fukushima Daiichi.

Two high-level international missions have been sent to Japan in recent months. From late May through early June, the IAEA dispatched a team of nuclear power and safety experts to Japan to gather a comprehensive set of conclusions and lessons learned that have been distributed through the global nuclear community. Its full mission report can be accessed at: http://www-pub.iaea.org/MTCD/Meetings/PDFplus/2011/cn200/documentation/cn200_Final-Fukushima-Mission_Report.pdf

A recent mission conducted in October focused on the remediation of areas off-site the Fukushima nuclear power plant affected by the consequences of the 11 March accident. A preliminary report of its findings can be accessed at: http://www.iaea.org/newscenter/focus/fukushima/pre_report.pdf

Since the accident occurred on 11 March, the Director General has provided updates on the Fukushima Dai-ichi accident to the general public and IAEA member states. The IAEA is now issuing regular updates on its website (www.iaea.org) and Facebook page (www.facebook.com/iaeaorg).