



# IAEA

**International Atomic Energy Agency**

*Atoms for Peace*

## Fukushima Daiichi Status Report

*4 November 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](mailto:info@iaea.org).

The IAEA has received new information regarding the detection of xenon-133 and xenon-135 gases on 1 November inside the Primary Containment Vessel (PCV) of Fukushima Daiichi Unit 2. Based on further analysis, Japanese authorities have concluded that the xenon concentrations are not due to a criticality event but rather from the spontaneous fission of curium-242 and 244. (Spontaneous fission is a form of radioactive decay that does not involve chain reactions and is characteristic of very heavy isotopes. Spontaneous fission occurs in low levels in all nuclear reactors.)

This conclusion is based on three key factors outlined and discussed in the report:

- The inventory of Cm-242 and Cm-244 was calculated as was the concentration of Xe-135, resulting from the spontaneous fission of Cm-242 and Cm-244. If nuclear fission of the reactor's uranium fuel were occurring, at the lowest possible level, the levels of xenon detected would be several orders of magnitude higher than those measured. Current levels of xenon are consistent with those that would be generated by spontaneous fission of Cm-242 and Cm-244.
- If the core had been experiencing a criticality event, the injection of boron water should have stopped the criticality and terminated the generation of xenon. However, the xenon levels were not influenced by injection of boron water into the core.
- If the core was undergoing a criticality event the temperature and pressure readings would be expected to rise as the event would increase heat production within the core. However, the temperature and pressure levels have not undergone any significant increases either before or after xenon were detected, indicating that no criticality event is occurring.

Presently the report detailing these findings is only available in Japanese. A link to the English version will be provided once it is made available.

***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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