

Fukushima Report: No.4

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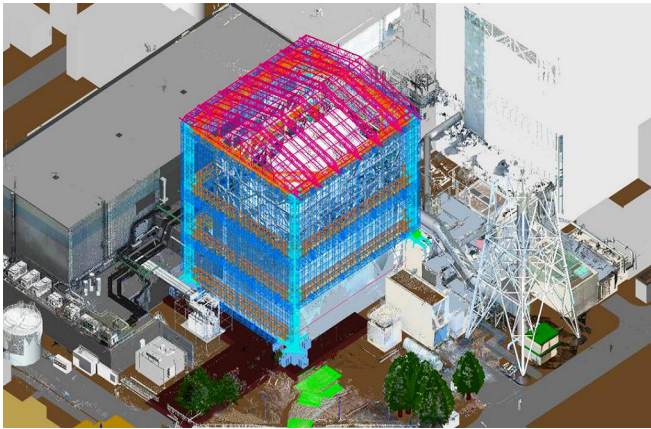


Image of Reactor Building Protective Cover
(No.1 Unit Reactor Building)



Provisional Assembly of Framework
for Protective Cover

1 Overview

(1) Six months since March 11

(i) Key points of the accident

It has passed six months since a magnitude-9 earthquake and an ensuing tsunami inflicted devastating damage on northeastern Japan on March 11.

The earthquake caused three nuclear reactors that were in operation at the Fukushima Daiichi Nuclear Power Station to be shut down as a safety mechanism through the emergency insertion of control rods, which halted the nuclear chain reaction. The giant tsunami, more than 14 meters high, subsequently struck the nuclear power station, causing the loss of all auxiliary power sources, including emergency backups. For the following 10 days or so, the nuclear power station had no power sources. As a result of the complete loss of power sources, there was no means to cool the three nuclear reactors that had been in operation and the spent fuels stored in the fuel pool of the Unit 4 that had been out of operation, making it impossible to cool down the decay heat.

Later, it came to light that within all these three nuclear reactors, the decay heat had damaged fuel rods, causing a meltdown. It also became known later that at the reactors of Units 1 to 3, there were likely to have leakages at the bottoms of the pressure vessels and the reactor containers.

In the meantime, zirconium contained in the alloy material constituting the fuel casing reacted with water, generating hydrogen. Hydrogen eventually concentrated in the upper portions of the buildings of the Unit 1, 3 and 4 reactor buildings through containment vessels, reached the inflammability limit, and exploded. As a result, the upper portions of the reactor buildings were significantly damaged. The explosions released radioactive materials outside the reactor buildings and beyond the premises of the nuclear power station. The released radioactive materials were mainly iodine 131 and cesium 137. The current level of released radioactivity is one ten-millionth or less than the level at the time of the release of radioactive materials caused by the hydrogen explosions.

(ii) Disposal of massive radioactive water

After the accident, the injection of massive amounts of water into the reactors started in order to cool the fuels and the reactors. After the run out of fresh water, seawater was injected. While the water injection operation helped to cool down the reactors, it led to the radioactive contamination of a massive amount of water. The volume of contaminated water reached more than 140,000 tons at its peak, creating a serious challenge as to how to manage and dispose of the radioactive water. However, this challenge has

been overcome as water decontamination and treatment facility has started operating after being built in just three and a half months through collaboration between Japan, France and the United States. Decontamination work (removal of cesium) is proceeding, with decontaminated water recycled as cooling water.

(iii) Roadmap toward stabilizing the accident

On April 17, Tokyo Electric Power announced a one-year roadmap toward stabilizing the nuclear accident and has been publishing a monthly review of the progress status of the roadmap since then.

(2) Recent situation of the damaged nuclear power station

Under the roadmap, April to June is characterized as the first-step period and the subsequent three to six months as the second-step period. In the second-step period, fuels are to be cooled down through a cooling water circulation system and additional release of radioactivity is to be reduced to a minimum so that residents evacuated from houses located near the damaged nuclear power station can return home.

In order to minimize the additional release and emission of radioactive materials from the damaged power station in autumn, which is a typhoon season in Japan, the construction of a protective cover for the Unit 1 reactor building has started, and preparations for similar work are under way for the Unit 3 and 4, too.

Measures have already been taken to prevent soil and dust particulates on the premises of the nuclear power station from being blown from the land surface into the air. With these first-step activities, which are preparations for the attainment of goals in the second step, most of the initial objectives have been achieved.

(3) Surrounding areas: Worries are growing with progress in monitoring

With the release of radioactive materials significantly reduced, the monitoring survey concerning soil in the surrounding areas is proceeding. Consequently, the status of contamination with radioactive cesium has gradually come to light. Some locations have been identified as "hot spots," where there is a high concentration of radioactivity due to wind conditions and geographical environment. Radioactive contamination has also fueled public concern over some foods. For example, as rice straw is widely used to feed for beef cattle, some contaminated meat of the cattle that ate rice straw with cesium has been found.

Mothers of local residents are most concerned over the impact of radioactive contamination on the health of their children. Many mothers wish to prevent their children from being exposed to the risk of contamination by playing on school grounds that may have been contaminated. Some schools and kindergartens have dug up the ground and covered the ground surface with soil retrieved from underground so as to reduce the level of radioactivity.

2. Recent electric power supply and developments related to energy policy

(1) New cabinet and energy debate

Following the resignation of Prime Minister Kan, the ruling Democratic Party of Japan (DPJ) held a leadership election on August 30 and Minister of Finance Yoshihiko Noda was elected as the new DPJ leader. Subsequently, the Diet elected him as Japan's 62nd Prime Minister on September 2, making him the third Prime Minister elected from the DPJ.

There are hopes that the Noda cabinet will clear the muddle over Japan's energy policy that has continued since the March 11 disaster, paving the way for substantive debate.

(2) Restriction on the usage of electricity and request for electricity conservation

This summer, northeastern Japan in particular has faced the risk of an electricity supply shortage due to the considerable damage done by the earthquake and tsunami disaster to electricity generating facilities.

Consequently, the government issued an order for large users such as industrial facilities in this region to reduce the usage of electricity by 15% compared with the peak demand of the previous year. Meanwhile, the government also called for efforts by households to reduce the usage of electricity by the same margin.

(3) Tough stance of the heads of host communities

Nuclear host communities have grown distrustful of the central government's nuclear policy because of the policy muddle as represented by former Prime Minister Kan's abrupt request for the shutdown of Chubu Electric Power's Hamaoka Nuclear Power Station and the confusion over the restart of nuclear reactors at Kyushu Electric Power's Genkai Nuclear Power Station. Many heads of nuclear host communities have considerably hardened their stance on the restart of reactors that have been suspended from operation for periodic inspection. Depending on circumstances, there is a risk that after the last of Japan's 54 nuclear reactors is suspended from operation for periodic inspection in May 2012, there will be no reactor in operation due to host communities' refusal to give the go-ahead for the restart of reactors.

Under these circumstances, the electric power utilities and other industries are hoping that the new cabinet will make a realistic decision based on the premise of the "safety first" approach and will regain the trust of the heads of host communities.

(4) Public opinions

(i) Opinion polls

Amid media reports over the energy situation as described above, some citizens are starting to pay renewed attention to the importance of electric power after experiencing electricity supply constraints in the form of the government's request for electricity conservation efforts and the order for manufacturing plants to reduce the usage of electricity.

This trend is apparent in the results of opinion polls conducted by various media organizations, which have also made clear that citizens are struggling with the question of energy options.

Generally speaking, as a result of the Fukushima accident, antipathy toward nuclear power generation is growing in Japanese society. At the same time, there are growing calls for using renewable energy as an alternative to nuclear power. On the other hand, not a few people are aware of the limitations of the use of renewable energy and believe that nuclear power will continue to be essential for the foreseeable future while large-scale use of renewable energy should be pursued as a long-term goal. On July 13, former Prime Minister Kan proclaimed the goal of creating a nuclear-free society. According to an opinion poll conducted by a Japanese news agency, 40.2% agreed with that goal, while 47.7% did not agree with it. While we must discount this finding somewhat given the unpopularity of the former prime minister himself, it is nonetheless noteworthy.

An opinion poll conducted on June 11-12 by a major newspaper critical of nuclear power generation) showed that 74% supported the abolition of nuclear power generation as a long-term goal. The same poll showed that 42% opposed the current use of nuclear energy and 37% expressed support (of the people who expressed support for the current use, 63% supported the abolition of nuclear energy as a long-term goal).

(ii) Crossroads in national debate and expectations for the new government

Japan is at an energy policy crossroads, as it faces the question of whether or not to continue with nuclear energy. Of course, the decision is up to the Japanese people to make.

The results of opinion polls conducted since the nuclear accident show that the Japanese people are starting to pay renewed attention to energy.

There are expectations that the new government will conduct substantive debate on energy issues while clarifying its policy priorities.

(End)