

Three Japanese nuclear reactors underwent meltdown

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The extent of the damage to the Fukushima Dai-ichi nuclear plant in north eastern Japan is only gradually emerging as engineers and workers struggle with the complexities of stabilising its stricken reactors.

Last week the plant operator, Tokyo Electric Power Company (TEPCO), acknowledged that the core of reactor 1 had undergone a meltdown and molten nuclear fuel had burned a hole in the bottom of its pressure vessel. On Sunday, TEPCO revealed that the cores of two more of the six reactors at the complex—reactors 2 and 3—had probably undergone a similar meltdown.

TEPCO spokesman Junichi Matsumoto said the pressure vessels—steel containers holding the reactor cores—were “likely to be damaged and leaking water at Nos. 2 and 3.” Each pressure vessel is surrounded by a concrete primary containment vessel, but these also appear to be leaking water from the damaged reactors.

During normal operations, the highly radioactive water in the pressure vessel of a boiling water reactor is turned to steam, drives turbines and then is recycled back into the reactor core. The March 11 earthquake and tsunami stopped power supplies to the Fukushima plant, severing its normal cooling systems. As a result, TEPCO has been forced to inject water continuously into the reactors to cool the fuel.

It is now clear that thousands of tonnes of highly radioactive water have been leaking out of the three damaged reactors. TEPCO announced on Saturday that it had found around 3,000 tonnes of water in the south-eastern section of the basement of reactor 1, filling it to a level of more than 4 metres. Some of the contaminated water that leaked from reactors 2 and 3 has already flowed into the sea.

The level of radioactivity inside the building that houses reactor 1 is up to 2,000 millisieverts an hour, which poses an extreme danger to workers. Following the disaster, Japanese

nuclear authorities lifted the annual maximum dose for nuclear workers to 250 millisieverts from 100 millisieverts, a figure that was already high by international standards.

TEPCO also provided preliminary data showing how quickly the crisis at reactor 1 emerged. The earthquake struck at 2.46 p.m. on March 11, causing the reactor to immediately shut down power production. By 6 p.m., water levels in the pressure vessel were falling, exposing the fuel rods, which were still generating intense heat through radioactive decay. The temperature soared to 2,800 degrees Centigrade. By 7.30 a.m. on March 12—that is, just 16 hours after the quake—most of the fuel pellets had melted and fallen to the bottom of the pressure vessel.

TEPCO began using fire trucks to pump water into the reactor in time to prevent further catastrophic damage. “Without the injection of water, a more disastrous event could have ensued,” TEPCO spokesman Matsumoto admitted.

The leakage of water has forced TEPCO to devise new plans to stabilise reactor 1. Engineers had proposed to flood the primary containment vessel, entombing the damaged fuel in water. Efforts are now being made to devise a method to recycle contaminated water from the reactor basement back into the reactor. Such a plan would be extremely dangerous, given the high levels of radioactivity. Moreover, the extent of damage to the reactor’s primary containment vessel, which acts as a shield from radioactivity, is still not known.

A 61-year-old contract worker at the Fukushima plant died on Saturday, apparently from a heart attack. While his death does not appear to be related to radiation, it is an indication of the huge stress being placed on workers at the site. TEPCO and other power companies are notorious for exploiting contract workers to carry out the most hazardous and difficult tasks at their nuclear plants.

TEPCO announced in mid-April that it had mapped out a blueprint to bring the three crippled Fukushima reactors to a safe state of cold shutdown within six to nine months. The company is due to announce a revised version of its plan today.

Despite the obvious complications confronting engineers, Prime Minister Naoto Kan declared yesterday that last month's timetable would be met. His special adviser Goshi Hosono claimed that the plan was realistic, pointing out that "the reactor cores are still being cooled down despite the apparent meltdown." The dubious assumption is that stabilisation operations will continue to proceed smoothly despite the fact that the full extent of damage to three reactors is unknown.

Kan's comments are driven more by political considerations, than a technical appraisal. Any delay in stabilising the Fukushima plant will only postpone the return of nearly 80,000 people who have been forced to leave the 20-kilometre exclusion zone around the facility. This week, another 15,000 people outside the exclusion zone are preparing to leave five towns where levels of radiation are high.

Kan's standing in opinion polls remains low, with most people critical of his handling of the nuclear crisis. The most recent polls showed that two thirds of respondents backed his decision earlier this month to close the Hamaoka nuclear plant, built on a fault line, pending tougher safety measures. However, a *Mainichi* poll found that support for the Kan government was at just 27 percent, up only slightly from 22 percent last month.

Kan's standing is likely to fall as the implications of a financial rescue plan for TEPCO, finalised last Friday, become apparent. The government plans to establish a new institution to provide funds to TEPCO to cover its compensation payments to individuals and businesses hit by the nuclear crisis, which could reach 4 trillion yen (\$US49 billion). The funds are to be structured to stave off a bankruptcy and paid back by the corporation, assuming it returns to profit.

Kan is walking a fine line. He risks public hostility if he funds the bailout by imposing higher taxes and cutting spending on essential social services. At the same time, he faces the ire of finance capital if the government makes further public borrowings. Japan's public debt already stands at more than 200 percent of gross domestic product. While TEPCO will be required to restructure and sell assets,

and other nuclear operators will contribute, the bulk of the money will come from public funds.

Last week Cabinet Secretary Yukio Edano hinted that "the public would not support" the rescue package unless TEPCO's creditors were willing to contribute by waiving or restructuring the company's debt. The suggestion brought the immediate disapproval of the markets expressed in a slump in shares for TEPCO and its main lenders—Sumitomo Mitsui Financial Group and Mitsubishi UFJ Financial Group.

The international credit rating agency, Moody's, yesterday cut TEPCO's rating to Baa3 from Baa1, one notch above junk status, and warned that further downgrades were possible. Its statement criticised the rescue plan for requiring TEPCO to pay back any funds, as it would "reduce the company's financial flexibility and diminish its capacity to pay other obligations." Moody's was particularly opposed to any suggestion that TEPCO's lenders be obliged to foot any portion of the huge costs, warning that it might downgrade its outlook for the major Japanese banks involved.

The government quickly backed off from Edano's statement. National Strategy Minister Koichiro Gemba told Asahi television: "I think Edano went a bit too far. The basic fact is that TEPCO, as a private firm, must voluntarily negotiate with banks for possible cooperation." Kan's special adviser Goshi Hosono declared: "I don't think Edano made any specific requests for banks [to waive debt]."

Just as in the US and Europe, the demand of international finance capital is that the working class must bear the brunt of the bailout of major banks and corporations—in this case caused by the worst nuclear disaster since Chernobyl. Inevitably, these new burdens will compound already sharp social tensions in Japan and fuel the political crisis confronting the Kan government and the political establishment as a whole.



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