Four workers die in Japanese nuclear plant accident

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On August 9, a fatal accident at a Japanese nuclear power plant raised new concerns about the safety of the country's nuclear energy program. Four contract workers were killed at a plant in Mihama, a small city 320 kilometres west of Tokyo, and seven were seriously injured when a cooling pipe carrying super-heated water burst.

The four workers killed—Hiroya Takatori, 26, Kazutoshi Nakagawa, 41, Tom oki Iseki, 30, and Eiji Taoka—suffered severe burns, and heart and lung damage. They were employed by contractor Kiuchi Keisoku Co, which was preparing the reactor, owned by Kansai Electric Power Co (KEPCO), for a weekend maintenance inspection.

According to a doctor who treated the victims at the nearby Tsuruga City Hospital, they suffered horrible injuries. Dr Yoshihiro Sugiura, quoted in the *Guardian* newspaper of August 11, said: "The ones who had died had stark white faces. This shows that they had been rapidly exposed to heat."

According to media reports in Japan, two workers remain critically injured, three suffered serious injuries and two received minor injuries. A lack of cooling water in the reactor's turbine was said to have caused the tragedy. Steam with an estimated temperature of 270 degrees Celsius was released from the burst pipe and hit the workers.

Company officials told reporters that no radiation leaked from the burst pipe in the secondary cooling system, as it did not carry radioactive water, and there was no need to evacuate the plant or the surrounding area in Mihama, which has a population of around 11,500.

The No. 3 nuclear reactor at the plant, which began operation in 1976, is said to have automatically shut down after the steam began leaking. Later, it was revealed that a steam generator detected a lowered water level as the result of the leak. Officials at the plant learnt of the accident only when a fire alarm sounded.

According to a report in *Yomiuri Shimbun*, "The disaster could have been prevented if the abnormality had been detected earlier with a system to locate minor leaks. A system to detect abnormalities before a fire alarm is the minimum required for the main piping system."

Prime Minister Junichiro Koizumi told reporters: "We must put all our effort into determining the cause of the accident and to ensuring safety." His government would respond "resolutely, after confirming the facts."

However, a review of the events leading up to the accident and the history of other nuclear industry incidents over more than a decade reveals that far from "ensuring safety", the government, together with the self-regulated nuclear power companies, is squarely to blame for the horrific deaths and injuries suffered at the KEPCO plant.

KEPCO admitted this week that the burst pipe had not been checked in the 28 years since the nuclear reactor began operating, even after a maintenance sub contractor notified it of the urgent need for inspection in November 2003. Further reports emerged that up to 17 such pipes at up to 10 other nuclear power plants operated by KEPCO throughout Japan have never been inspected.

Government investigators and police are conducting searches and interviews with workers and senior officials at the Mihama plant, and criminal charges may be laid over company negligence. An August 13 article in the *Asahi Shimbun* reported: "Police said the companies should have learned a lesson from a similar steam-leakage accident in 1986 at the Surry nuclear power plant in the US state of Virginia. The 1986 accident also killed four workers when a ruptured pipe spewed out steam."

The article explained that the Virginia accident was caused by corrosion wastage, due to water turbulence at high temperatures, which over time reduced a pipe's thickness. Police investigating the Mihama disaster believed that the "risky section of the pipe would have been discovered if an ultrasonic checkup was properly conducted".

According to the article, no checkups were made on the pipe after Mitsubishi Heavy Industries Ltd, which was in charge of inspections at the plant until 1996, failed to enter the pipe section on its checklist. The Osaka-based Nihon Arm Company, which took over the inspection contract in 1996, stated that it did not notice the omission until April

last year.

KEPCO claimed that it was not informed of the lack of inspection until later in 2003. Nevertheless, even then it put off an examination of the section until a routine inspection that was due to take place two days after the fatal accident.

A *Daily Yomiuri* report raised concerns about KEPCO's laxity in precautions to prevent accidents at the Mihama plant and four other nuclear reactors it operates in the Fukui Prefecture. Comments by a senior KEPCO official revealed that the company concerned itself only with the safety and maintenance of primary cooling systems linked to the reactor vessel, not so-called secondary equipment. "The main problem in terms of the plant's equipment and facilities is that the ruptured section was part of the main piping system of a nuclear power plant," the article stated.

A visiting professor from Tohoku University's Fracture and Reliability Research Institute, Tatsuo Kondo, commented: "The main piping requires the highest attention since an accident in this section can lead to a catastrophe." His remarks are a chilling warning of future calamities, given the self-regulation regime that exists in Japan's nuclear industry, the advanced age of the 23 pressurised water reactors similar to the Mihama plant and the inferior materials used in secondary piping.

Primary piping is made of stainless steel, which is much stronger than the carbon steel used in secondary systems. "A source close to the power industry said it would cost a fortune if stainless steel was used for all piping," *Daily Yomiuri* reported.

The *Yomiuri Shimbun* article referred to additional concerns over the software used to run the Mihama plant. "Under a security system provided for the primary system, a minor leak can be located quickly to prevent a small crack in a pipe from developing into a blowout. The primary system is also equipped with various other detectors. But there are few safety features protecting the secondary system."

This month's incident is the worst since a radiation leak in a uranium processing plant at Tokaimura in September 1999 killed two workers and irradiated hundreds of others. But numerous other less-reported accidents have happened. On August 20, the *Japan Times* said the Nuclear and Industrial Safety Agency had reported nine steam leakages over an unspecified time period.

In 1991, the KEPCO Mihama plant leaked 55 tonnes of radioactive water from its No. 2 reactor. In 2000, just a little under six months after the Tokaimura radiation leak, a fire was reported to have broken out at a nuclear power plant in Onagawara.

Two years ago, Tokyo Electric, Japan's largest power company, was forced to close its 17 nuclear power plants temporarily after admitting that it had covered up inspection reports revealing dozens of cracks in its reactors during the 1980s and 1990s.

In February 2004, eight nuclear workers were exposed to low-level radiation when they were accidentally sprayed with radioactive contaminated water.

Despite this troubling record, the Koizumi government plans to build several new reactors by 2010, adding to the 52 already in operation. To offset Japan's dependence on oil imports, the government wants to increase the nuclear power output from 30 to 40 percent of the country's energy consumption.

The accident at Mihama on August 9, the anniversary of the 1945 atomic bombing by the US of the city of Nagasaki will understandably raise the concerns of the Japanese people over the safety and regulation of this industry. Since the accident at Tokaimura, numbers of communities throughout Japan have voted against the construction of nuclear power plants in their regions.

On August 10, Aileen Mioko Smith, director of Green Action in Japan, told the *Guardian*: "There is already widespread mistrust beneath the surface. But when something like this happens, those feelings will come to the fore. There have been fewer inspections and a reduction in the number of items that are checked ... the continuing deregulation of the Japanese nuclear power industry would encourage power companies to cut costs when they should be investing more in safety."

On August 13, Economy, Trade and Industry Minister Shoichi Nagakawa told reporters that the Mihama accident was a "disaster caused by human factors". But what has been revealed since the accident points to more underlying causes: an official policy that serves the interests of profit-driven power companies.