

Worker's death exposes the dirty secrets of Japan's nuclear industry

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Hisashi Ouchi, one of three workers exposed to massive doses of radiation during last September's accident at the Tokai-mura nuclear fuel processing plant, died of heart failure on December 21 at the University of Tokyo Hospital. He had been exposed to 17,000 times the legally sanctioned dose of radiation—comparable with radiation levels at the epicentre of the atomic bomb dropped on Hiroshima. His immune system had been destroyed, with his white blood cell count barely registering.

For 83 days medical staff exerted unprecedented efforts to keep Hisashi alive, including daily blood transfusions, multiple skin transplants and what is believed to be the world's first transfusion of peripheral stem cells. Doctors treating him stated that he displayed signs of pain throughout his treatment, despite huge doses of painkillers. He was resuscitated from a heart failure on November 27. He lost consciousness in mid-October and never regained it.

A preliminary investigation published by Japan's Science and Technology Agency (STA) on November 5 makes clear the Tokai-mura accident and Hisashi's death are the direct product of cost-cutting and appalling safety standards inside the plant.

The JCO Corporation, which operated the Tokai-mura plant, chemically purified enriched uranium dioxide, which was supplied to many of Japan's 51 nuclear reactors. Along with two other workers, Hisashi was delegated on the day of the accident to finish an order for a specialised type of uranium fuel for an experimental reactor known as Joyo. Production of fuel for Joyo involved handling enriched uranium with 18.8 percent of the fissile U-235 isotope as compared to just 5 percent for commercial reactor fuel.

The process involved mixing a uranium oxide with nitric acid in a dissolving tank to produce uranyl nitrate. The mixture is transferred by pump into a specially designed buffer tank and from there it is passed into a precipitation tank. It is then mixed with ammonia to precipitate solid uranium oxide that is of a purer grade. This is repeated until the required level of chemical purity is reached. JCO had altered the safety manual to permit workers to combine

uranium oxide and nitric acid in steel buckets rather than the dissolving tank. The solution was manually poured into the buffer tank.

Due to the risk of forming a critical mass of uranium fuel that would initiate a nuclear chain reaction, the Japanese government standards stipulated that no more than 2.4 kilograms of enriched uranium oxide could be mixed at a time. The buffer tank is shaped to prevent a critical mass occurring, even if the limit is exceeded. The STA investigation stated that it was common practice at JCO for up to 16 kilograms to be poured into the buffer tank.

On September 30, JCO was rushing to produce enriched uranium oxide to fulfill an order for Joyo fuel. Two of the three workers assigned to the task had never carried out the process before. None of them were aware of the dangers involved nor were they under the supervision of technicians or managers. Over the previous years, JCO had cut its staffing levels from 162 to 110 due to falling profits and sales. University qualified technical staff had been reduced from 34 to 20.

To save time the untrained and unsupervised workers mixed seven buckets, or some 16 kilograms, and poured them directly into the precipitation tank instead of the specially shaped buffer tank. As the seventh bucket was poured in the mixture reached critical mass initiating a sustained chain reaction.

The nuclear reaction lasted up to 20 hours exposing the plant and 500 metres beyond to levels of radiation many times above the official safe dose. Even though hundreds of people live and work in the immediate vicinity, the company did not inform the STA for at least 45 minutes and government authorities gave no evacuation order for four-and-a-half hours.

At least 69 people, mainly JCO workers, but also firefighters and local residents, were exposed to unsafe levels of radiation. The long-term impact on the estimated 300,000 workers and residents within a 10-kilometre radius of the plant will not be known for years.

The Tokai-mura plant was incapable of containing a

radiation leak and had no emergency plan in place in case of a nuclear accident. The company had received approval from the government for construction on the basis that an accident was impossible because the density and mass of mixtures could never approach critical mass. No government regulator had inspected the operation in 10 years.

The accident at Tokai-mura was not an isolated event. There have now been five nuclear-related accidents since 1995. In the aftermath of Tokai-mura, there was a public outcry with opinion polls showing 70 percent of the population opposed to nuclear energy on safety grounds and criticisms of the lack of government control of the privately owned and essentially self-regulated nuclear industry.

As a result the Labor Ministry conducted inspections of 17 facilities. Health and safety violations were found at 15. Inspections of nine nuclear fuel processing plants and laboratories found 25 violations ranging from inadequate training of staff, failure to provide workers with regular medical checkups and failure to report radiation exposures. These were not, however, snap inspections. Lacking its own protective equipment, the Labor Ministry had given the companies 24 hours advance notice.

The safety record of Japan's nuclear industry as a whole is now coming under intense public scrutiny. Particular attention is being given to the research of Yuko Fujita, an associate professor of Physics at Keio University, who has been campaigning for years for better safety conditions in nuclear industry. He told that the *Japan Times* on December 27: "The nuclear industry is sustained by workers exposed to deadly radiation".

Fujita cites a case two years ago when around 1,000 unskilled workers were hired by the Fukushima No.1 Nuclear Power Plant to replace a core shroud in one of the plant's reactors. The atmosphere inside the reactor was so radioactive that workers could only remain inside for three minutes. Under Japanese health standards, it is entirely legal for a worker to be exposed to the maximum official annual dose of radiation in a matter of minutes. The limit in Japan is 50 millisieverts per year as compared to international recommendations of 100 millisieverts over five years.

Fujita has focused on the abuse of sub-contract workers. While the nuclear plants maintain a core staff of technicians and skilled workers, the bulk of labour is supplied by subcontracting firms. Of the 71,000 workers currently working in the nuclear industry, at least 63,000 or 89 percent, are employed by contractors. The companies who own the plants are therefore not responsible for monitoring their health or providing stable employment. Yuko Fujita believes that of the 300,000 workers employed in the nuclear industry since the 1970s, at least 800 have been exposed to potentially cancer-causing levels of radiation.

Many of the workers employed for the most dangerous labour are believed to be hired on a day-to-day basis from the swelling numbers of homeless and destitute workers in areas like Tokyo's Sanya district and the Kotobuki area of Yokohama. With work in the nuclear power plants paying up to three times more than the construction sites and factories, there is no lack of volunteers. When they have been exposed to the annual radiation limits, the workers are fired and sent back to the streets. It is feared that some workers are then re-hired for work in other plants under false names, where they are exposed to further radiation. Japanese trade unions only cover one third of nuclear industry workers and maintain a close collaboration with the major employers. They have done little to halt the abuse of contract workers and deny it is taking place.

Among the poorest of the poor, these workers rarely know their legal rights and generally do not pursue court actions against the nuclear companies or the subcontractors. A report by the *Los Angeles Times* on December 31 cited the case of Kunio Murai. In 1970 he was hired as a day labourer for janitorial work in a nuclear power plant. Along with another worker, he was instructed to mop up a leak of radioactive water. They were provided with no safety equipment and worked two hours in a confined space. Their radiation meter registered off the scale, but the untrained workers believed it must have been broken. Six months later Kunio's teeth and hair fell out and his joints ached. A diagnosing doctor, provided by the nuclear company, assessed his medical problems as unrelated to his work. Later, on the understanding that no legal action would be taken, he was paid off with \$60,000.

A Japanese Labor Ministry spokesman, quoted in the *Los Angeles Times*, summed up the official position toward the continuing health concerns: "There is work that exposes people to radiation that has to be done so long as you want to sustain the current energy supply. They say it is discrimination, but there is freedom of work in our country, and if people don't want these jobs they can quit".

Speaking to the *Japan Times*, Fujita commented: "I often go to the Yokohama's Kotobuki area and tell workers not to work at nuclear power plants, but they ask me, 'How else can I keep from starving to death?' For many day labourers, earning money for tomorrow's bread is much more important than the risk of cancer several years down the line."



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