

Japan: Fuel removal begins at stricken nuclear plant

By John Watanabe
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Tokyo Electric Power Company (TEPCO), the operator of the stricken Fukushima Daiichi power plant, officially started transferring nuclear fuel rods from the damaged reactor 4 building on November 18. The dangerous process could result in the release of large amounts of radioactivity if anything goes wrong. It is a critical step in decommissioning the plant, which TEPCO estimates will take 30 to 40 years.

The highly radioactive rods have to be kept underwater while being moved from the building. If they are exposed at any point, the rods will emit huge quantities of radiation, drive workers from the site and produce another catastrophe. Arnold Gunderson, a nuclear power expert, told journalists there was “the equivalent of 700 nuclear bombs worth of material in that fuel pool.”

As perilous as the fuel removal might be, leaving it in the spent fuel pool on top of a structurally damaged building would potentially be even more hazardous. The building is reportedly sinking into the ground, its foundations undermined by groundwater.

On March 11, 2011, a magnitude 9.0 earthquake and 15 meter-high tsunami hit the plant, knocking out power supplies and stopping the cooling systems for the nuclear reactors and spent fuel pools. This caused partial meltdowns in reactors 1, 2 and 3, which were active at the time. The radiation around these reactors is still so high that TEPCO cannot ascertain their state, and the company is not planning to start removing their melted fuel cores until 2020 at the earliest.

Reactor 4 was shut down at the time, undergoing a regular safety check. Its fuel, both spent and still to be used, was submerged in the fuel pool on the fifth floor. When not in use, nuclear fuel needs to be kept underwater and cooled. This contains its radiation, and keeps it from overheating, catching fire and releasing

its radioactive content.

A hydrogen explosion blew the top off reactor 4’s building just four days after the quake, exposing the fuel pool directly to the atmosphere, significantly weakening the whole building structurally, and causing a lot of debris to fall into the pool. The buildings housing reactors 1 and 3 also suffered hydrogen explosions.

In the weeks after the disaster, resupplying water to reactor 4’s fuel pool was one of the top priorities. Military helicopters poured water from above, and seawater was pumped from below, in a desperate attempt to keep the fuel cool. Since then, TEPCO has built a steel structure to reinforce the reactor 4 building, cover the exposed pool and support two cranes to remove the fuel.

According to the three-stage plan for decommissioning the Fukushima reactors, announced by the Japanese government and TEPCO in December 2011, removal of nuclear fuel from the reactor 4 fuel pool belongs to stage two, after an initial debris removal and preparatory phase.

Because of the uncertainties surrounding the level of damage to the fuel rods, the removal will have to be conducted by human crane operators, rather than by computers as in normal circumstances. One expert told Reuters it was like trying to pull cigarettes undamaged from a squashed pack.

Thirty-six workers will conduct the operation, working in teams of six for just two hours at a time because of the high radiation levels. Three layers of gloves and heavy protective gear restrict their visibility and freedom of movement and will exacerbate the dangers in the highly delicate task.

“Handling spent fuels involves huge risks ... It would be a disaster if radioactive materials come out ... during

the work,” Shunichi Tanaka, chairman of the Japanese government’s own Nuclear Regulation Authority, admitted.

There are 1,553 fuel rods or assemblies in the pool, 202 of which are unused. TEPCO will start removing the unused rods first, as their radioactive levels are lower, and they are deemed safer to move. At least 3 assemblies are known to have been damaged even before 2011, and will require special treatment.

The assemblies are slowly moved by a special crane—all underwater—to a submerged cask that can contain 22 of them. A bigger crane then lifts the tightly sealed cask and loads it on a trailer truck, which takes it to a storage pool, some 100 meters west of the reactor 4 building. The fully-loaded cask will weigh 91 tonnes. The first such cask was reportedly moved successfully on November 21. TEPCO estimates it will only finish removing the fuel by the end of 2014, leaving the plant highly vulnerable for some time to come.

TEPCO is under pressure from its creditors—Japan’s top financial conglomerates—to turn a profit in the fiscal year ending March 2014. Following the 2011 disaster, TEPCO cut wages by 20 percent and its workforce by 2,400. Presently going through another round of talks for further loans and refinancing, it is soliciting an additional 1,000 “voluntary” retirements.

At the same time, decontamination work at and around the Fukushima plant—subsidized by the government—is plagued by a shortage of workers and appalling, slave-like conditions. According to Reuters, “TEPCO sits atop a pyramid of subcontractors that can run to seven or more layers,” with unscrupulous middlemen, including Yakuza crime syndicates, skimming up to a half of workers’ earnings.

The subcontractors often prey on the most vulnerable, homeless or indebted people, who are brought in without any previous experience, often lied to about the prospective work conditions, dumped in overcrowded company housing and left with no social security. A labor ministry report in July found that nearly 70 percent of the small firms involved in decontamination work violated labor regulations, but no penalties were levied.

Despite the government having taken a controlling stake in TEPCO last year, in order to bail it out, Economy Minister Toshimitsu Motegi, who is in charge of decommissioning the plant, has claimed that

he “can only go so far in telling TEPCO to improve workers’ conditions.” TEPCO’s general manager for nuclear power, Masayuki Ono, also washed his hands of the abuses. He told Reuters that the contractors “hire their own employees, taking into account our contract. It’s very difficult for us to go in and check their contracts.”

As this dangerous work is taking place, the damaged plant continues to be plagued by problems it has suffered since the catastrophe: radioactive water seeping into the ocean, a lack of adequate storage for radioactive water, and the ongoing risk of further tremors or quakes.

Backed by successive Japanese governments and the official nuclear safety agencies, TEPCO has a long record of underreporting leakages and exposure risks, both for the workers inside the plant, and for the wider population (See: “TEPCO reports new leaks at Fukushima reactor”). What dominates are the interests of the nuclear industry’s profits and the Japanese ruling elite’s determination to keep open its option to develop nuclear weapons.

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