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Step 3 of Active Tests Begins at Rokkasho

Japan Nuclear Fuel Ltd (JNFL) completed step two of the active tests ("hot tests") at the Rokkasho reprocessing plant on 6 December 2006 and commenced step three on 29 January 2007. The overall schedule was delayed in response to two incidents involving worker exposure to radiation in May and June last year ([NIT 113](#)). According to JNFL, the tests were 45% complete at the end of December.



Three stacks of the Rokkasho reprocessing plant (Photo by Noboru Kobayashi)

Schedule for start of full operations delayed again

On January 31st JNFL President, Isami Kojima, announced that the active tests would not be completed until October, meaning that the start of full operations would be delayed by 3 months to November 2007. This is the 10th time the schedule has been delayed. However, this date assumes the active tests, including

pre-start-up government inspections, will be completed without further incident. In reality, a number of procedures must be completed before full operations can start. Both central and prefectural governments must assess the results of the tests and Aomori Prefecture and Rokkasho Village must conclude safety agreements for full operations with JNFL. Given that there are likely to be more incidents and accidents during the remainder of the tests and that various alterations and extensions are being carried out at the plant, we presume that start-up will be further delayed.

One would expect the delay to increase the plant's total cost, but Mr. Kojima said that JNFL would absorb the costs through management efficiencies. Hence, the total cost remained at 2,193 billion yen. However, further cost increases are inevitable. It is just that JNFL is trying to hide the true cost of reprocessing. (See [News Watch](#) re subsequent cost increase to 2,353 billion yen.)

No checks after step 3

During the first two steps, 60 tons of spent fuel was reprocessed in a period of seven months. By comparison, during steps three to five, JNFL plans to reprocess 340 tons in ten months. From the beginning of step three, JNFL has commenced reprocessing a large quantity of BWR fuel. The Head End Building and the Separation Building have two process lines, one for PWR fuel and one for BWR. We are concerned that problems will arise in the BWR line, because only limited experience with BWR spent fuel has been accumulated at the plant on which Rokkasho is based, the French reprocessing plant in La Hague. A large quantity of higher burn-up

fuel will be reprocessed, so the amount of radioactivity released will greatly increase. Also, according to the current schedule, vitrification of liquid high-level waste will commence in the latter half of July.

However, the published schedule includes no "hold-point" from steps three through five. At the end of steps one and two there were hold-points, during which JNFL submitted reports which were assessed by the local, prefectural and central governments. Thus, external checks were built into the program. However, from now on, JNFL will proceed from one step to the next on the basis of its own judgment alone. JNFL should be made to release information about the tests for step three onwards, to enable external assessment of plant safety, the state of operations, the quantity of radioactivity released and contamination of the surrounding region.

In this regard, it is worth noting that the Aomori prefectural assembly abrogated its responsibility to carry out its own assessment of JNFL's report on step two. The report was submitted in December and the Nuclear and Industrial Safety Agency and the Nuclear Safety Commission completed their reviews on January 15th and 16th respectively. However, the prefectural assembly failed to exercise its right, as the representative of the people of Aomori, to directly question JNFL and the government about the report. Aomori Governor, Shingo Mimura, gave his approval for JNFL to proceed to step 3 on January 29th and the tests recommenced later that day.

Retraining for analysis work

Step two continued for 4 months from 12 August to 6 December 2006. It became clear that there were inadequacies in regard to the subcontracting of analysis work and staff training after two instances of internal radiation exposure occurred in the Analysis Building during step one. JNFL was under pressure to take corrective action, so during the first month and a half of step two JNFL trained staff in analysis procedures and tested the accuracy of their analysis. One must ask why such training was not carried out sooner. If it were not for the incidents of radiation exposure, this training would not have been carried out at all. This is a good illustration of the safety problems at the plant.

Production of MOX begun

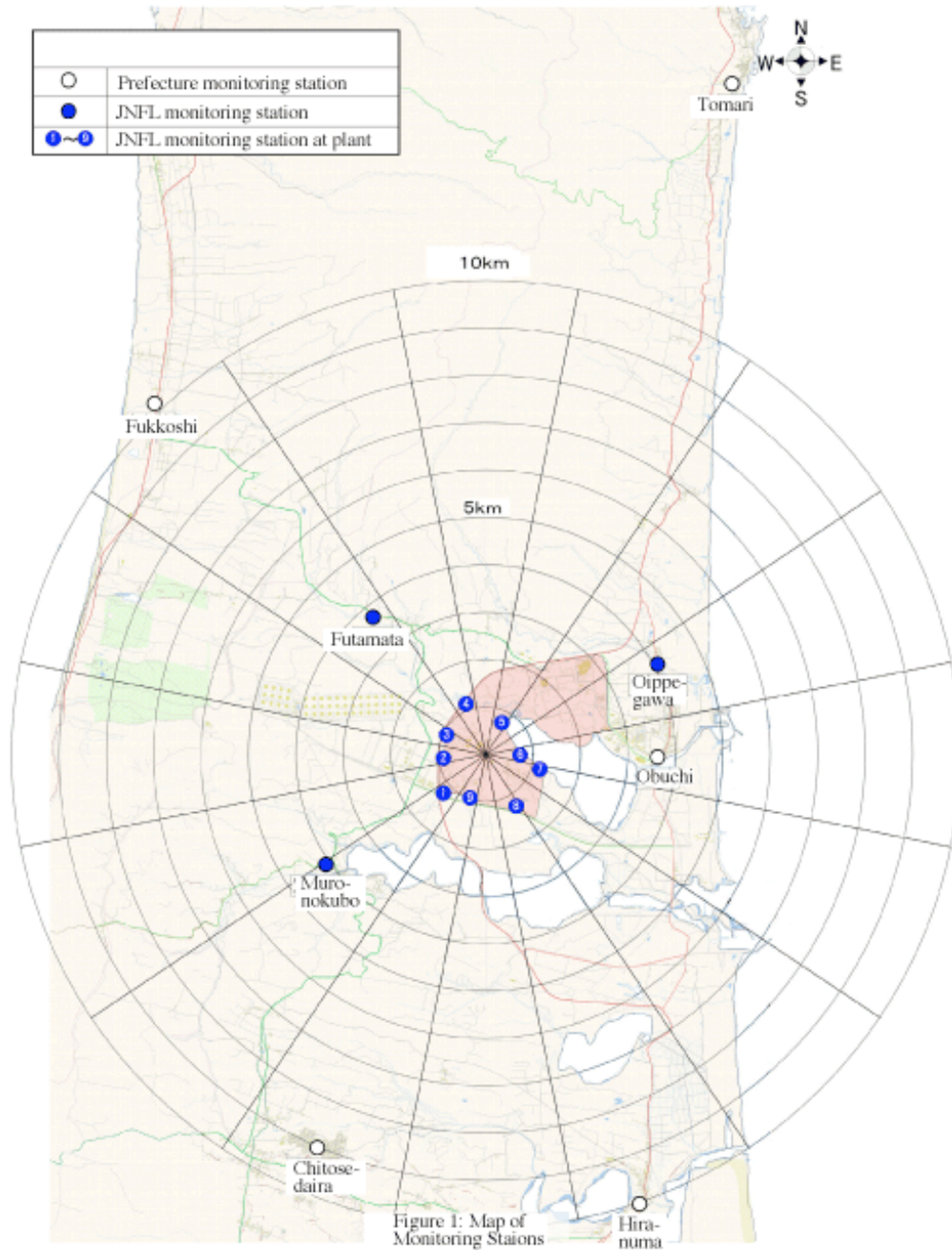
Sixty tons of spent fuel was reprocessed during step two, including 50 tons of PWR fuel (109 assemblies) and 10 tons of BWR fuel (57 assemblies). During step two, tests commenced in the Uranium Denitration Building and the Uranium-plutonium Co-denitration Building. A total of 212 kilograms of MOX powder (uranium-plutonium mixed oxide powder) was produced, 170 kilograms in November and 43 kilograms in December (figures do not add up due to rounding). A nuclear agreement between Japan and the US prohibits extraction of plutonium by itself, so solutions of plutonium nitrate and uranium nitrate are mixed in a one to one ratio. This is then denitrated to produce a mixed oxide, which is stored as mixed plutonium-uranium powder (see [NIT 115](#)). It is planned that a total of 7 tons of MOX will be produced during the active tests. (See other article in [NIT 117](#) for details of the electric power companies' MOX utilization plans released on 23 February 2007.)

Detection of Krypton 85

Monitors have begun to detect the release of krypton. According to JNFL's step 2 report and Aomori Prefecture's "Report on Environmental Radiation from Nuclear Facilities" (2006 Fiscal Year, second quarter (July-September)), on 18 August 2006 elevated radiation levels (beta emitting gases) were detected 4 kilometers south-west of the Rokkasho reprocessing plant by a monitoring station in the Muronokubo district of Rokkasho Village (see map below). Until then the concentration had remained below the minimum detectable level of $2,000 \text{ Bq/m}^3$, but on that day for one hour (22:00~23:00) the average concentration rose to $3,000 \text{ Bq/m}^3$. The radiation was detected when spent fuel was being sheared at the reprocessing plant, so it must have been beta rays from Krypton. Elevated levels of aerial gamma radiation has also been recorded 4 to 5 kilometers from the plant at Obuchi, Oipegawa and Muronokubo. JNFL says in its report that this is not a cause for concern, because the radiation recorded was within the range detected before active tests began.

However, it is clear that beta levels at least have begun to exceed this range.

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