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<h2>Summary Report of Peer Review</h2>
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(Provisional Translation)

Place of Evaluation:	Nuclear Fuel Industries, Ltd. Tokai Works (Tokai-mura, Naka-gun, Ibaraki prefecture)
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1. Objectives

The purpose of the NSnet peer review is to achieve an improvement in the “safety culture” of the entire nuclear power industry by sending review teams of member specialists to member facilities, where they conduct reciprocal evaluations on common nuclear safety subjects among members and share mutual knowledge about the horizontal progress of good practices as well as subjects that have been singled out.

2. Areas of Review

In this peer review, a lesson was learned from the occurrence of the nuclear criticality accident (hereafter referred to as “the JCO accident”) that occurred last year at the JCO uranium processing plant. The areas of review at nuclear fuel facilities, therefore, center upon the appropriate performance of work on nuclear safety, including the prevention of serious accidents such as criticality and fires/explosions.

The review was divided into six areas: organization/administration, emergency measures, education/training, operation/maintenance, radiation protection, and serious accident prevention. An evaluation was made by comparing performance to the best practice in the nuclear energy industry.

In the area of serious accident prevention, nuclear criticality accidents were added to the accidents involving explosions and fires when the safety of nuclear fuel facilities was evaluated. The prevention of occurrence was the target of this review.

In the other areas, the review targeted a number of issues that relate to the factors behind the occurrence of the JCO accident. These are organizational policies and activities aimed at stimulating the development of a “safety culture,” the system of organization and the clarification of responsibility, worker education/training, worker knowledge/skill, observation of written operation procedures, and the transfer of technical knowledge.

Moreover, the company’s self-checking activities that affect operation safety were especially targeted in the review of the process, facilities, and equipment. Emphasis was placed on the safety awareness and ethics of the employees.

At the time of the review, it was also thought that one factor behind the JCO accident was the implementation of efficiency improvement measures by the management that drastically reduced the number of personnel. These measures were implemented because of poor business performance, which was caused by the international price competition started in 1990's.

3. Execution of Review

From May 23rd to the 26th of this year, a review was conducted at Nuclear Fuel Industries, Ltd. Tokai Works in Tokai-mura, Ibaraki Prefecture. The review team consisted of seven people in all. There was one clerical manager from NSnet and six reviewers, one each from The Kansai Electric Power Co., Inc., Ishikawajima-Harima Heavy Industries Co., Ltd., Central Research Institute of Electric Power Industry, Hokuriku Electric Power Co., Mitsui Engineering & Shipbuilding Co., Ltd., and the NSnet office. To conduct the review, the six reviewers were assigned to one of three groups, two reviewers per group.

The first group was responsible for reviewing organization/administration, emergency measures, and education/training. The second group handled operation/maintenance, and radiation protection. The third group reviewed the prevention of serious accidents.

The review recognized a number of good practices and some suggestions for improvement by mainly observing the plant, targeting various activities promoted by the workers themselves for the improvement of safety, and by interviewing workers, confirming documents presented, and asking questions based on the documents.

In the course of the review, the review team aimed at exchanging ideas about the nuclear power "safety culture." One way the team attempted to accomplish this was through the communication of useful practices carried out by the members, such as an appropriate presentation of the power plant's periodic inspection handbook.

4. Summary of the Facility Operation

Tokai Works targeted in this review is one of the two nuclear fuel manufacturing plants of Nuclear Fuel Industries, Ltd., where the other one is Kumatori Works in Kumatori-cho, Osaka Prefecture. Tokai Works began operations in January 1980 and its main business has been the manufacturing of boiling water reactor fuel (BWR fuel). As a secondary business it also carries out the manufacturing of other type of fuels such as pressurized water reactor nuclear fuel (PWR fuel) pellets for Kumatori Works, advanced thermal reactor nuclear fuel (ATR fuel), and high-temperature, gas-cooled reactor nuclear fuel (HTR fuel). The number of employees including those at the company's subsidiaries totals about 270 people.

At Tokai Works, there are business licensed processing facilities and the HTR fuel production facility permitted to use of nuclear fuel material in accordance with the Law on Regulation of Nuclear Source Material, Nuclear Fuel Material and Reactors.

The manufacturing of BWR fuel, PWR fuel pellets, and ATR fuel is carried out at the processing facilities. The approved uranium enrichment is below 5%.

The main process consists of a pelletizing step (the process where uranium dioxide powder is pressed and sintered in the form of small columnar pellets) as well as a subsequent process. (a fuel rod process that encapsulates the fuel pellets in a fuel cladding tube made of the alloy zircaloy, and a fuel assembly process that converts the fuel rods into fuel assembly)

The manufacturing of BWR fuel at the processing facility yielded 100-150 tons of uranium per year over the past five years. This meets about 20% of Japan's demand for BWR fuel. Over the past four years, the results of PWR fuel pellet manufacturing came to 2-5 tons of uranium per year, and over the past five years, the manufacturing of ATR fuel yielded 3-6 tons of uranium per year. This was used in Japan Nuclear Cycle Development Institute's Fugen advanced thermal reactor.

The production of HTR fuel is carried out at the HTR fuel production facility with approved uranium enrichment below 20%. From 1995 to 1997, the manufacturing results of this facility yielded about one uranium ton of high-temperature engineering test reactor (HTTR) initial loading fuel (enrichment level is below 10%) at Oarai Research Establishment of the Japan Atomic Energy Research Institute.

5. Main Conclusions

Taking a broad view of the results of the review, which took place this time at Nuclear Fuel Industries, Ltd. Tokai Works, with respect to nuclear safety, no problems were found that would lead to the occurrence of a serious accident, even if the improvement measures were not adopted immediately. Moreover, it is confirmed that the administration and employees are united as one and are conscientiously working toward continuing and strengthening the guarantee of nuclear industry safety. In the future, it is desirable that Nuclear Fuel Industries, Ltd. Tokai Works continues making further efforts for fostering a better “safety culture” and that Tokai Works will never forget the lessons learned from the JCO accident.

It is also desirable that the results of Tokai Works’s review are also reflected at the company’s Kumatori Works.

At the peer review this time, a number of good practices were discovered that should be introduced by the other NSnet members and the nuclear energy industry. The main examples are listed below.

- The administration learned some very important lessons from the JCO accident. As well as actively playing a leading role in overall safety inspection, a safety administrative department under the direct control of the president of the company has been established. They are now working toward improving safety.
- In an effort to prevent human error, very thorough training is being carried out with SD Education (skill development) to improve the technical level of individual employees. After the skill level of each employee for each type of job is understood, the necessary education and training is then carried out.
- The occurrence of possible deviation from the nuclear limitation value is assumed for each facility and piece of equipment used in each process. In connection with prevention measures, the possibility of criticality is evaluated in detail. This sort of systematic approach that aims at more high-level criticality safety management is promoted throughout the entire facility.

In order to continue the good performance to date and further improve the present safety level of Nuclear Fuel Industries, Ltd. Tokai Works, some proposals are given, the main ones of which are listed below.

- Nuclear safety has managed in part with the issue of safe and hygienic operations. However, with the JCO accident as a turning point, various operations have been implemented to further strengthen nuclear safety. It has been decided that one of these, an internal safety audit conducted by the safety administrative department should be regularly performed. We expect this to be a fixed operation from now on.
- A good training/education textbook on criticality safety has been prepared, but to strongly emphasize the lessons of the JCO accident, they should be given to the workers using more effective education materials.

In the future, we expect this “safety culture” to reach all concerned employees, including the workers involved in production especially in the area of criticality safety.

- The chief technician of nuclear fuel should check safety aspects with regards to the enactment and revisions of the Operation Procedure textbook that contains regulations, standards, and subordinate standards.
- Extensive fire measures have been taken, but we would like detailed methods of action to be clarified, assuming there is an emergency fire, so that the fire station’s fire fighting operations may provide better support.

Other details concerning this report may be found on the Japanese homepage.