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NSnet document number：（NSP-RP-029）
Date of publication: March 3, 2003

Summary Report of Peer Review

(Provisional Translation)

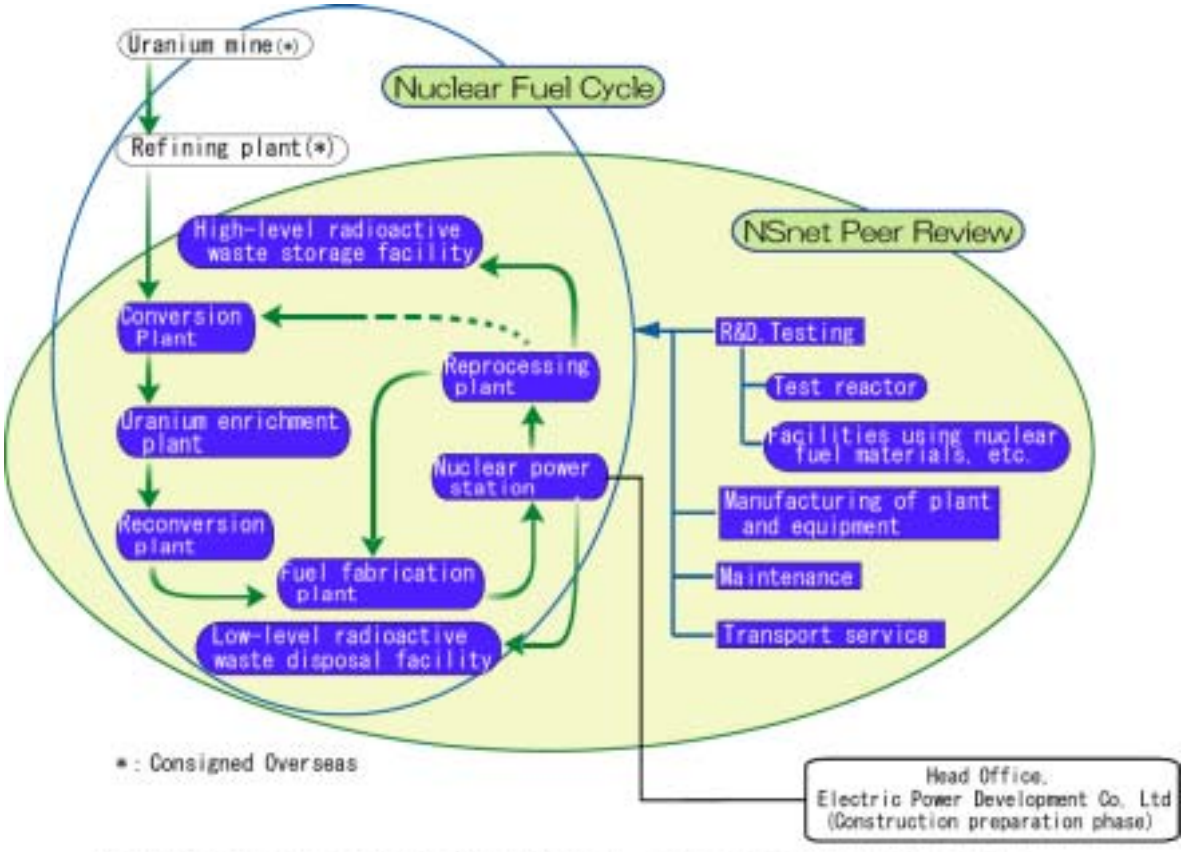
Place of Review:	Electric Power Development Co., Ltd. (Chuo-ku, Tokyo)
Date of Review:	January 21 to 23, 2003
Publisher:	Nuclear Safety Network

Contents

1. Objectives

The purpose of the NSnet peer review (hereafter referred to as “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. Summary of Facility Operations



Head Office, Electric Power Development Co, Ltd in the nuclear fuel cycle

Electric Power Development Co, Ltd. is planning the construction of its first nuclear power station in Oma-machi, Shimokita District, Aomori Prefecture. Preparatory work for the construction is currently underway.

This review examined the company’s efforts for developing a nuclear safety culture.

Electric Power Development Co, Ltd. (hereafter referred to as “J-POWER”) was established in 1952 as a special company that develops and supplies electric power supporting the economic development of Japan. Since then, it has contributed to stable electric power

supply as a wholesale electric power operator.

Since its establishment, in accordance with the national government's energy policy, it has constructed large-scale hydraulic power stations that are difficult to construct, domestic coal thermal power stations in harmony with the national coal policy and imported coal thermal power stations as alternative energy to oil thermal power. At present, these power generation facilities are located at 66 sites nationwide, generating approximately 16 million kW and are connected to 2,400 km of power-transmission lines.

J-POWER is currently endeavoring to drastically improve its managerial efficiency and financial conditions to achieve full privatization in accordance with the Cabinet decisions in 1997 and 2001. It is also promoting new operations with the keywords "Energy" and "Environment" aiming to develop new businesses after its privatization. In view of a significant change in its managerial environment expected in the context of privatization and electric power liberalization, it is actively carrying out CI (Corporate Identity) activities with the aim of reforming its corporate culture and improving its corporate image. As part of these activities, a new communication name "J-POWER" has been introduced since April 2002.

J-POWER's nuclear business is planning the construction of its first nuclear power station in Oma-machi, Shimokita District, Aomori Prefecture (hereafter referred to as "Oma Nuclear Power Station.")**.** Oma Nuclear Power Station is an Advanced Boiling Water Reactor (ABWR) aiming to use mixed-oxide (MOX) fuel assemblies[i] in all of its reactor cores (full MOX-ABWR) with the support of the national government and electric power companies. It has the political position of expanding the flexibility of the plan to utilize plutonium at light water reactors in Japan (Plutonium-thermal plan).

In J-POWER's Nuclear Power Dept., the Head Office of the Dept. (hereafter referred to as the "Head Office") is actively carrying out preparatory work for the construction of Oma Nuclear Power Station together with its local organizations Oma Nuclear Power Project Construction Preparation Office and Aomori Branch Office. The Head Office is composed of 14 groups to which 125 personnel are assigned.

3. Points of Review

Although J-POWER does not own nuclear facilities yet, it was decided to conduct this peer review centering on its current activities to ensure nuclear safety from the viewpoint that it will own and operate nuclear power stations in the future.

Specifically, considering that J-POWER is presently in the stage of preparing for the construction of a nuclear power station, the review was conducted focusing on the following five points:

(1) Activities to ensure nuclear safety
(2) Corporate culture and ethics education
(3) Quality assurance activities
(4) Educating nuclear engineers
(5) Reflecting experience from earlier nuclear power stations

The review was divided into four sections: (1) Organization/Administration, (2) Education/Training, (3) Design management, and (4) Handling of important issues. It was carried out with a focus on the nuclear industry's best practices.

Of these, the reviews were carried out with a focus on, in (1) Organization/Administration, "composition of organization and system of responsibility", "activities related to fostering a nuclear safety culture and improving morale" and "quality control"; in (2) Education/Training, "education and training planning (including improving engineers' skills, technology dissemination and ethics education)"; in (3) Design management, "manuals and observance of the manuals," and "design information exchange and design review "; and in (4), Handling of important issues, "efforts to ensure nuclear safety" and "reflecting practices of nuclear power stations of other companies."

In addition, in view of the "problem of manipulating self inspection records at nuclear power stations" and the "problem concerning the leakage rate inspection of pressure containment vessels" (hereafter collectively referred to as the "data manipulation issues in self inspection") that have been brought to light recently, an in-depth review was conducted with respect to activities that help establish a climate in which no dishonest acts would occur, recognizing anew the importance of engineers' morals and corporate ethics.

4. Period and Outline of Review

(1) Date
January 21st (Tue.) to January 23 (Thu.), 2003
(2) Formation of Review Teams
A group: Mitsubishi Heavy Industries, Ltd., Kobe Steel, Ltd.
B group: Shikoku Electric Power Co., Inc., NSnet Office
Coordinators: NSnet Office
(3) Fields of Responsibility
A group: Organization/Administration, Handling of important issues (including reflecting practices of earlier nuclear power stations)
B group: Education/Training, Design management, Handling of important issues (Efforts to ensure safety associated with the use of MOX fuel assemblies)

(4) Facilities to be reviewed

Based on “3. Points of Review,” safety promotion activities concerning the preparation work of the construction at the Head Office were subjected to the review.

5. Schedule of Review

The review was carried out over a three-day period for each field according to the schedule shown below.

<table>
<tr><th colspan="2"></th><th colspan="2">A Group</th><th colspan="2">B Group</th></tr>
<tr><td rowspan="5">1/21
(Tue.)</td><td>A
M</td><td colspan="4">Opening (Greetings, Members Introduction, explanation of plant facilities, work summary, etc.)</td></tr>
<tr><td>A
M</td><td>1. Organization/
Administration</td><td>- Effective organization and management
[Document Examination]</td><td>2.Education/
Training</td><td>- Planning and implementation
[Document Examination]</td></tr>
<tr><td rowspan="3">P
M</td><td rowspan="3">1. Organization/
Administration</td><td rowspan="2">- Safety culture
[Document Examination]</td><td rowspan="2">2.Education/
Training</td><td>- Planning and implementation
[Document Examination]</td></tr>
<tr><td>< Responsible persons >
[Interviews]</td></tr>
<tr><td>< Director >
[Interviews]</td><td>3. Design management</td><td>-Design management organization
- Design management
[Document Examination]</td></tr>
<tr><td rowspan="4">1/22
(Wed.)</td><td rowspan="3">A
M</td><td rowspan="2">1. Organization/
Administration</td><td>< Manager class >
< Responsible persons >
[Interviews]</td><td>3. Design management</td><td>< Manager class >
< Responsible persons >
[Interviews]</td></tr>
<tr><td>- Quality control
[Document Examination]</td><td rowspan="2">4. Handling of important issues</td><td>- Efforts to ensure safety associated with the use of MOX fuel assemblies
[Document Examination]</td></tr>
<tr><td>4. Handling of important issues</td><td>- Reflecting practices of earlier nuclear power stations
[Document Examination]</td><td>- Preparing measure to prevent human errors
[Document Examination]</td></tr>
<tr><td>P
M</td><td colspan="2">Verification of Facts</td><td colspan="2">Verification of Facts</td></tr>
<tr><td rowspan="2">1/23
(Thu.)</td><td rowspan="2">A
M</td><td colspan="4">Verification of Facts</td></tr>
<tr><td colspan="4">Closing</td></tr>
</table>

6. Methods and Items of Review

6.1 Methods of Review

The review was conducted with respect to safety promotion activities concerning the preparation work of the construction at the Head Office and identified good practices and suggestions for improvement through the examination of the documents presented, discussions and interviews based thereon as shown below.

In addition, nuclear safety cultural exchange took place in the review process, represented by opinion exchange facilitated by the provision of reference information from the review team, such as methods for disseminating targets and examples of other companies' codes of conduct.

6.1.1 Execution of Review

(1) Document examinations

For the document examination, the review was conducted by requesting necessary relevant documents based on explanations regarding related documents for each review item.

(2) Interviews

Interviews based on the following objectives were conducted with the director, deputy director, managers and responsible persons.

(a) Examining the level of the effort and awareness toward the fostering of safety culture including nuclear safety measures

(b) Gathering additional information not confirmed in the documentation

(c) Questions and answers including ones arising from document examination

(d) Evaluating the level of understanding of the items determined and the responsibility imposed on each member

(e) Evaluating whether the rules that have been established are being implemented or whether they are merely carried out in name only.

6.1.2 Standpoint for selecting Good Practices and Suggestions for Improvement

(1) Good Practices

"Information on good practices incorporating appropriate, effective, and unique methods into activities to ensure safety should be widely distributed to the members of the NSnet and the nuclear industry"

(2) Suggestions for Improvement

"After comparing practices of the Head Office with the best in the nuclear industry, suggestions to improve and enhance safety activities should be implemented so as to achieve the highest level of nuclear safety."

Even if current activities are equal to or higher than general standards in the nuclear industry, there is still room for improvement.

6.2 Items of Review

The Field observations and confirmations, document examinations, and interviews were carried out based on the review items shown below. The results were evaluated and organized in the Itemized Results, and those were summarized as the Main Conclusions.

Section 1: Organization/Administration

Investigations were conducted to see whether organizational structure and accountability is clear, whether objectives to ensure nuclear safety have been defined and disseminated positively, whether activities to promote safety culture and improve morality are being carried out (for example, ethics related programs and the system and culture of seriously accepting internal opinions), whether its efforts to address quality assurance systems and issues are appropriate, and the status of the organization of a cooperative system in emergencies at other companies.

Review items

(1) Effective organization management

a. Clarifying the organization and the system of responsibility
b. Securing the suitable personnel
c. Setting up goals of the organization
d. The leadership of the managers
e. Cooperative system in emergencies at nuclear power stations of other companies

(2) Activities to promote safety culture and improve morality

a. Concrete activities related to fostering safety culture
b. Concrete activities related to improving morale
c. Public acceptance activities for the local community

(3) Quality control

a. Effective audit system
b. Preventing data falsification

Section 2: Education/Training

Considering that J-POWER will operate nuclear plants in the future, investigations were conducted to see whether appropriate education and training is being offered for present nuclear engineers to improve their abilities, facilitate technology dissemination, and acquire basic knowledge of nuclear safety, ethics and morals.

Review items

(1) Planning and carrying out education and training

a. Planning education and training

b. Carrying out education and training (to improve nuclear engineers' skills and promote technology dissemination)

Section 3: Design management

Investigations were conducted to see whether personnel and working environments concerning nuclear plant design management are secured, whether the development of design management manuals and the compliance are ensured, and whether design processes are controlled appropriately.

Review items

(1) Design management

a. Design management organization

b. Design management

Section 4: Handling of important issues

Investigations were conducted with regard to their efforts to address issues to ensure safety in constructing and operating a full MOX-ABWR, cope with good and problematic practices from earlier plants, and develop measures to prevent human errors.

Review items

(1) Efforts to ensure nuclear safety

a. Efforts to ensure safety associated with the use of MOX fuel assemblies

(2) Reflecting practices from nuclear power stations of other companies

a. Reflecting practices from earlier nuclear power stations

b. Measures to prevent human errors

7. Main Conclusions

In summing up this review of the Head Office, we have not found any item in the nuclear safety field that would lead to a serious accident unless immediate remedies were taken.

Since Oma Nuclear Power Station is presently in the stage of preparing for its construction, its current tasks are mainly:

(1) Examining designs to prepare for approval
(2) Examining construction plans
(3) Local construction work (preparatory work)
(4) Developing rules and manuals
(5) Developing personnel for construction and operation
(6) Fuel procurement related tasks
(7) Information exchange with earlier power companies

Specifically, while preparing for construction, they are actively carrying out to maintain a foundations for improving communication, revitalizing workplaces, and promoting nuclear PA[ii] setting "Changing attitudes toward privatization" as a basic theme. Among them, multiple good practices were observed, which may serve as a good reference for other companies.

On the other hand, to make sure not to let problems, such as the recent data manipulation issues in self inspection, happen in the company in the stages of full-scale construction and operation, it is expected that the current activities will be expanded and that specific measures will be taken according to the progress of its business.

In this review, we have found some good practices that should be introduced not only to other NSnet members, but also to the nuclear industry at large. The good practices are described below.

<u>- Revitalizing communication by group discussion and practice activities</u>

The Head Office actively carried out group discussion and practice activities to address three major themes in twelve teams based on free questionnaire involving all personnel: 1. PA, 2. Business Promotion, and 3. Revitalization.

These activities contribute to revitalizing communication among employees of various levels and raising consciousness.

In addition, it is a good idea considering the psychological aspect of participants to have middle class employees involved as organizers aiming at revitalizing communication, so that the group leader class employees can support activities of each team and help smoothly fill

generation gaps.

This is a good practice that has lead to the management's support to general QC circles and activities at the management level, which may serve as a good reference for other companies.

- Dispatching employee as lecturers to classes of local schools

As an activity to promote public acceptance in the Oma area, J-POWER employees are dispatched as lecturers to schools in the area of education support about scientific experiments and teaches scientific knowledge. This has been greatly contributing to building a relationship of mutual trust.

- Appointing young employees as lecturers for transferred employees

Training is offered by lecturers in the Nuclear Power Dept. approximately twice a year for employees transferred from other departments to the Head Office. Appointing young employees as lecturers for transferred employees has the dual effect that lecturers themselves study and trainees attend lectures with the sense of familiarity.

- Utilizing the full MOX-ABWR CAI system

A CAI (Computer Assisted Instruction) system with simulation functions has been introduced to make it possible to study visually using the assistance of computer terminals. Offering personal training ensures the systematic learning of technical knowledge about ABWR facilities. This CAI system covers extensive study areas, such as full MOX cores, control systems, and plant behavior, which is effective enough to understand the characteristics of a full MOX-ABWR, contributing to improving the knowledge of employees in engineering sections. The CAI training software is an original one created by J-POWER designed for its full MOX-ABWR. It allows sequential or repetitive study about the system and core characteristics and so forth in basic and applied courses and theme study. In addition, CAI study schedules are prepared and made known to ensure the effective operation of the CAI system.

The following represent proposals toward the further improvement of safety culture of the Head Office.

- Utilizing internal audits

Internal audits have been conducted focusing on the implementation of quality assurance activities prescribed in manuals. However, it is desirable for the internal audit team to have stronger awareness that they will discover matters that would lead to business improvements.

- Clarifying educational subjects regarding criticality safety

Although criticality safety related education is implemented in external basic training and internal training for transferred employees, it is not clarified as a subject in "education and training programs." It is desirable to publish it as a specific subject in annual plans to repetitively promote the understanding of criticality safety that has been considered important since the JCO accident.

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

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[i] Mixed-Oxide Fuel : Nuclear fuel that contains fissile nuclides composed of two or more types of oxides. Generally, it refers to nuclear fuel mainly composed of uranium oxide and plutonium oxide (excerpted from "Nuclear Dictionary: The Nikkan Kogyo Shimbun Ltd.")

[ii] PA: public acceptance: "Public Acceptance" means activities to promote the social understanding of corporate activities, so that corporate activities and operations can be carried out smoothly (excerpted from the homepage of the Civil Engineering Association for Power Companies.