

## Evaluation of comprehensive checks on power generation facilities and responses

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Ministry of Economy, Trade and Industry  
Nuclear and Industrial Safety Agency

Falsification of data came to light one after another last year at power generation facilities of utilities. The Ministry of Economy, Trade and Industry (hereinafter referred to as "METI") directed electric utilities to conduct comprehensive checks, under directions of Mr. Amari, Minister of Economy, Trade and Industry, on November 30, 2006. The utilities reported the comprehensive check results on March 30, and also reported measures to prevent recurrence on April 6.

METI scrutinized the contents of the reports and the measures to prevent recurrence. METI's evaluation results and responses are presented here.

### 1. Background

- (1) Concerned cases came to light such as inappropriate corrections of measured values of dams at hydraulic power generating facilities, temperature measurements of cooling sea water at thermal and nuclear power generating facilities. METI directed utilities\* to conduct comprehensive checks on existence of any data falsification, failure of required procedures or other concerns at the hydro, thermal and nuclear power generating facilities, and to report the results of such checks by the end of March this year.  
  
\* 12 companies of Hokkaido Electric Power Company Inc., Tohoku Electric Power Company Inc., Tokyo Electric Power Company Inc., Chubu Electric Power Company Inc., Hokuriku Electric Power Company Inc., Kansai Electric Power Company Inc., Chugoku Electric Power Company Inc., Shikoku Electric Power Company Inc., Kyushu Electric Power Company Inc., Okinawa Electric Power Company Inc., Japan Atomic Power Company Inc. and Electric Power Development Company Ltd.
- (2) These comprehensive checks were conducted based on the directions by Mr. Amari, the Minister of Economy, Trade and Industry, that the utilities should "tell the whole truth." The directions aimed at achieving the following to further enhance safety at power generating facilities:
  - (i) To sever the vicious circle of data falsification which drags the past wrongdoing;
  - (ii) To establish a system to disallow wrongdoing;
  - (iii) To share information of incidents and accidents, and to take advantage of it to prevent recurrence;
  - (iv) To improve the utility's tendency by making steady efforts.
- (3) The utilities submitted their reports to METI of their comprehensive check results regarding data falsification on March 30, and also submitted measures to prevent recurrence on April 6.
- (4) METI scrutinized these reports and the measures to prevent recurrence. METI's evaluation results and responses are presented here.

### 2. Reports and other information

The reports and other information are shown in the following appendices;

- Appendix 1: "Evaluation of comprehensive checks on power generating facilities and responses", (Message from the Minister of Economy, Trade and Industry)
- Appendix 2: "Evaluation of comprehensive checks on power generating facilities and responses", (summary)\*

*\* Full text of the report is available only in Japanese for the time being.*

## **Evaluation of comprehensive checks on power generating facilities and responses**

### **Message from Mr. Akira AMARI, the Minister of Economy, Trade and Industry**

I directed electric utilities to conduct comprehensive checks regarding data falsification at each of their power generating facilities in November last year, since the data falsification came to light one after another last autumn.

This is based on my directions that “the utilities should tell the whole truth.” The aims of the directions are the following:

- 1) To sever the vicious circle of data falsification that drags past wrongdoing;
- 2) To establish a system to disallow wrongdoing;
- 3) To share information of incidents and accidents, and to take advantage of it to prevent recurrence;
- 4) To improve the utility's tendency by making steady efforts.

The utilities conducted a vast amount of work, such as interviews with more than 70,000 persons in total, including not only their current and retired staff but also personnel of subcontractors and manufactures. Results of comprehensive checks and measures to prevent recurrence were reported to me by April 6.

It is important to utilize the results of such comprehensive checks effectively, to improve the safety of power generating facilities. For this purpose, METI has conducted evaluations on the results of comprehensive checks and on the measures to prevent recurrence at utilities.

Especially, concerning the evaluation of them, METI conducted rigorous evaluations based on criteria independently established in the context of incompliance with laws and orders as well as safety assurance.

NISA has completed the work and wrapped up the evaluation results of the comprehensive checks and 30 items that should be responded. METI discloses those today. METI will be committed to materializing responses and will strongly ask the utilities and manufacturers to implement measures to firmly prevent recurrence.

Today, based on such philosophy, I will ask the top management of all electric companies directly, as utilities which assume important work of supplying stable electric power, that each company shall never conduct data falsification and cover-ups under the “system of disallowing wrongdoing” and also ask to make a renewed start with sincerity to ensure public confidence.

I regret that the cases came out during the comprehensive check caused anxiety for the public. From now on, METI will committed itself to materialize 30 measures and explain such efforts to the public in a clear way.

Among others, nuclear power generation does not emit carbon dioxide and is also superior to others in stable power supply, it is extremely important for the Japan's energy policy and global environmental preservation to promote nuclear energy. In this context, I will promote nuclear energy policy to make Japan the safest and securest nuclear-energy-based country in the world.

## Evaluation of comprehensive checks on power generating facilities and further actions (Summary)

### 1. Background

- (1) In 2003, the government tried to fundamentally improve the inspection system of nuclear power generation, to deal with the wrongdoing of electric utilities. On the other hand, data falsification came to light one after another last autumn at the power generation facilities of electric utilities. METI directed all electric utilities to conduct comprehensive checks on whether there was data falsification, inadequacy of the required legal procedures or other similar problems in the past at nuclear power generating facilities on November 30, 2006, under the directions of Mr. Amari, the Minister of Economy, Trade and Industry.
- (2) Responding to the directions, all electric utilities reported comprehensive check results on March 30, 2007, and reported measures to prevent recurrence on April 6, 2007.

### 2. Aims of the comprehensive check

The aims of this comprehensive check are the following:

- (1) To sever the vicious circle of data falsification that drags past wrongdoing. It is necessary to liquidate wrongdoing including the past wrongdoing to keep correct records.
- (2) To establish a system to disallow wrongdoing. It is necessary to establish a system, even a case that might have deviated from the standards, to disclose correct information of the case with causes of deviation and evaluation results without falsification and cover-ups.
- (3) To share the information of incidents and accidents, and to take advantage of it to prevent recurrence. Safety is further enhanced by investigating causes of individual incidents and accidents, taking measures to prevent recurrence, and sharing information with other companies.
- (4) To improve the electric utility's tendency by making steady efforts. To establish robust foundation so as to supply stable electricity on the premise of safety by improving the tendency as a public utility.

### 3. Evaluation of the results on comprehensive check

#### 3.1. Evaluation of the results on comprehensive check

- (1) Before evaluating the results of the comprehensive check, a categorization system was established and cases were categorized as I, II, III and IV from the viewpoint whether it violated the Law for the Regulation of Nuclear Source Material, Nuclear Fuel Material and Reactors and the Electricity Utilities Industry Act, and whether they impaired safety. (Attachment 1)
- (2) Among 316 subject cases (309 were submitted by the Federation of Electric Power Companies), 50 cases fell into Category I, 104 cases Category II, 149 cases Category III and 13 cases Category IV.
- (3) Among Category I, in which cases are categorized as "violated laws and affected safety," 11 cases were nuclear such as the cover-up of criticality in Shika Nuclear Power Station Unit 1 of Hokuriku Electric Power Company and the false indication of pump start-up in Kashiwazaki Kariwa Nuclear Power Station Unit 1 of Tokyo Electric Power Company. (Attachment 2)  
21 cases were hydro and 18 were thermal.
- (4) For nuclear, there were no report of data falsification which violated the laws after enactment of a new inspection system which started in October, 2003.

### 3.2. Evaluation of measures to prevent recurrence

- (1) In the measures submitted by electric utilities to prevent recurrence, the utilities proposed to establish a system in order to comply with laws and codes of company ethics and to find wrongdoing.
- (2) The utilities also proposed to promote further sharing of information through communication within and without the company and utilization of “Nuclear Information Archives (NUCIA)”.
- (3) Regarding the measures to prevent recurrence of each utility, it is necessary to specify and materialize an action plan by taking into account the feasibility of their measures in order to secure prevention of recurrence and to make utmost efforts to ensure safety.

## **4. Response**

Based on the results of this comprehensive check, the responses will be proposed not only regretting the past wrongdoing, but also further ensuring safety of power generating facilities, considering the four aims of the comprehensive checks. (See the 30 items)

(The number at the end of each paragraph indicates the corresponding number of the action in the Attachment 4)

### 4.1. Administrative actions and special responses according to the comprehensive check (See Attachment 3)

- (1) For the 7 nuclear power stations (9 units) which were categorized as evaluation category I, NISA orders them, as the administrative action pursuant to Paragraph 3 of Article 37 of the Law for the Regulation of Nuclear Source Material, Nuclear Fuel Material and Reactors, to revise the Operational Safety Program so as to establish a system to report serious accidents immediately to the top management from the viewpoint of preventing recurrence. (Attachment 4 (1))

For these nuclear power stations, special inspections will be conducted in addition to the periodic inspection in order to rigorously confirm safety by taking additional time. Furthermore, the Special Nuclear Facilities Oversight Officers of NISA will conduct special supervision on nuclear power stations. (Attachment 4 (6) and (7))

- (2) For the hydro and thermal areas, regarding 10 electric utilities categorized as Category I, NISA orders them, as the administrative action pursuant to Paragraph 3 of Article 42 of the Electricity Utilities Industry Act, to revise the Safety Rules so as to make the Chief Engineer possible to carry out sufficiently his supervising responsibility to ensure safety from the viewpoint of preventing recurrence. (Attachment 4 (2))

- (3) Furthermore, for 2 power stations of the hydro area, as they do not conform to the Technical Standards even now, NISA orders them, as the administrative action pursuant to Article 40 of the Electricity Utilities Industry Act, to shut the stations down and repair so as to make them conform to the Technical Standards. (Attachment 4 (3))

For the hydro and thermal power stations (125 hydro power stations and 5 thermal power stations), which had failed to confirm safety related problems until the comprehensive checks, onsite inspections will be conducted pursuant to Article 107 of the Electricity Utilities Industry Act, from the viewpoint of confirming conformity to the Technical Standards. (Attachment 4 (21))

### 4.2. Requirements for utilities and manufacturers

- (1) NISA asks electric utilities to develop action plans with time scheduled to materialize the measures to prevent recurrence. (Attachment 4 (4))
- (2) NISA asks major manufacturers of nuclear plants to develop action plans, including a system to share information in order to improve the level of nuclear safety. (Attachment 4 (5))

### 4.3. Other responses

(Nuclear)

- (1) Thorough implementation of unescorted access to facilities by the resident nuclear safety inspectors (Attachment 4 (9))

- (2) Establishment of a system to assure independence of the Chief Engineer for Reactors (Attachment 4 (12))
- (3) Obliging the electric utilities to report withdrawal of control rods, etc. (Attachment 4 (13))
- (4) Disclosure of the results of safety inspections on nuclear power generating facilities (Attachment 4 (14))

(Hydro and thermal)

- (1) Implementation of onsite inspection (Attachment 4 (21))
- (2) Improvement in the description of the Safety Rule pursuant to the Electricity Utilities Industry Act (Attachment 4 (22))
- (3) Reexamination of the codes and standards regarding thermal and hydro power generation (Attachment 4 (25)) etc.

**Evaluation criteria and evaluation results on  
the comprehensive check results**

**(i) Evaluation criteria of NISA**

Category	Evaluation Category of NISA
I	Cases that failed to comply with the requirements specified by the Law for the Regulation of Nuclear Source Material, Nuclear Fuel Material and Reactors or the Electricity Utilities Industry Act, and impaired or could impair safety.
II	Cases that were confirmed or evaluated by April 20, 2007, that they failed to comply with the requirements of the Law for the Regulation of Nuclear Source Material, Nuclear Fuel Material and Reactors or the Electricity Utilities Industry Act, but did not or could not impair safety. They, however, had compliance implications.
III	Cases that failed to comply with laws other than the Law for the Regulation of Nuclear Source Material, Nuclear Fuel Material and Reactors and the Electricity Utilities Industry Act (including the requirements provided for stable and efficient electric power supply) and had compliance implications.
IV	Others (errors in writing, etc.)

**(ii) Evaluation results**

Evaluation category	Nuclear	Hydro	Thermal	Total
I	11	21	18	50
II	38	22	44	104
III	40	45	64	149
IV	9	0	4	13
Total	98	88*	130	316

\* For the hydro area, there were seven cases in the report of Tokyo Electric Power Company, which were not contained in the report of the Federation of Electric Power Companies, and NISA conducted the evaluation including such cases.

**List of 11 cases evaluated as Category I in the nuclear area**

Name of Electric Power Co.	Name of plant	Time	Description
Hokuriku Electric Power Co.	Shika Nuclear Power Station Unit 1	June, 1999	<ul style="list-style-type: none"> <li>○ Criticality accident occurred during reactor outage (during the periodic inspection)</li> </ul> <p>During the periodic inspection outage, a criticality accident with the withdrawal of 3 control rods occurred by failure of the work of isolating the hydraulic control unit. Regarding this accident, the operational log and others were falsified, and the accident was not reported to the regulatory body, which was required by the law. Furthermore, cause investigation and measures to prevent recurrence were not taken.</p>
Tokyo Electric Power Co.	Fukushima Daiichi Nuclear Power Station Unit 3	November, 1978	<ul style="list-style-type: none"> <li>○ Reactor criticality with the withdrawal of control rods and falsification of operational log</li> </ul> <p>During the periodic inspection outage, five control rods were <b>withdrawn</b> due to failure of the work of isolating the hydraulic control unit and the reactor became critical. The shift personnel on duty at that time had no recognition of the criticality, and took no action on it. Therefore, the critical state continued for seven and a half hours. In addition, the operational log was falsified and the fact was covered up.</p>
	Fukushima Daini Nuclear Power Station Unit 4	October, 1988 ~ January, 1990	<ul style="list-style-type: none"> <li>○ Wrongdoing in the process of construction plan and in the pre-service inspection for control rod mechanism</li> </ul> <p>During the scram test for a unit of the control rod drive mechanism (CRDM), replacement work of the relevant unit of CRDM was planned to be conducted due to defect of one unit of CRDM, but it was not noted in the construction plan. After that, wrongdoing was committed such that pre-operational inspection of CRDM was conducted using an imitation product.</p>
	Kashiwazaki Kariwa Nuclear Power Station Unit 1	May, 1992	<ul style="list-style-type: none"> <li>○ False indication of start-up of the residual heat removal cooling intermediate pump (A)</li> </ul> <p>Although the motor for the residual heat removal cooling intermediate (RHIW) pump (A) had failed, the indicator lamp in the main control room was made to indicate falsely as it started, and the inspection by the regulatory body was conducted under such conditions. After that, the reactor was started without confirmation of integrity of other systems which was required by the Operational Safety Program.</p>
Chugoku Electric Power Co.	Shimane Nuclear Power Station Unit 2	May, 1998	<ul style="list-style-type: none"> <li>○ Non-confirmation of operability of other trains during repair work for leakage of the cooling water of diesel engine</li> </ul> <p>Although one train of the emergency diesel generator was not available during rated power operation, it was not identified by the records that the tests of other trains, which were required by the Operational Safety Program for continuing operation, were performed.</p>
	Shimane Nuclear Power Station Unit 1	June, 2001	<ul style="list-style-type: none"> <li>○ Non-confirmation of operability of other systems during repair work for failure-to-open of the main stop valve of the high pressure injection system (HPCI MSV)</li> </ul> <p>Although repair work was conducted due to failure-to-open of the main stop valve during rated power operation, it was not identified by the record that confirmation of operability of the alternative emergency core cooling system, which was required by the Operational Safety Program for continuing operation, was performed.</p>

Japan Atomic Power Co.	Tsuruga Power Station Unit 2	January, 1994	<ul style="list-style-type: none"> <li>○ Non-confirmation of operability of other systems during replacement work of the parts (gasket) for maintaining leak-tightness of the emergency diesel generator</li> <li>When leakage of the cooling water system for the emergency diesel generator occurred, operation was continued without confirming the integrity of other systems.</li> </ul>
	Tsuruga Power Station Unit 1	August, 1995 ~ March, 2000	<ul style="list-style-type: none"> <li>○ Cover-up of corrosion event on the outside of condensate water storage tank</li> <li>Thickness of the tank became less than the required minimum thickness specified in the application document for authorization of the construction plan due to corrosion of the lower part of the tank. However, the tank was used, as it was, with lowering the water level, without confirmation of its required strength.</li> </ul>
	Tsuruga Power Station Unit 2	April ~ December, 1996	<ul style="list-style-type: none"> <li>○ Cover-up of the time of the occurrence of small leakage of primary coolant</li> <li>When leakage was discovered on the piping in the containment, the plant should have been shut down and repaired. However, the fact was covered up, and operation was continued for about 8 months in such a state.</li> </ul>
	Tsuruga Power Station Unit 2	July, 1997	<ul style="list-style-type: none"> <li>○ False operation of pressure equalizing valve during a containment leakage test</li> <li>During containment leakage testing, a test was conducted with a closing plate, which was put at the outlet of the inside pressure equalizing valve of normal airlock having identified leakage, without authorization of the adequate internal procedure. After the test, the pressure equalizing valve was replaced and the reactor was started, but a local leakage test was not performed before the reactor start-up.</li> </ul>
	Tokai Daini Power Station	Before 2001	<ul style="list-style-type: none"> <li>○ Falsification of flow rate data at the functional test of gas treatment system in the reactor building</li> <li>As the air flow rate did not meet the prescribed flow rate condition during a functional test of the emergency gas treatment system, measured value was falsified so as to satisfy the prescribed value by adjusting the instrument.</li> </ul>

**Administrative actions and special responses  
according to the comprehensive check**

(Numbers in parenthesis correspond to the number of 30 items)

Category	Item	Description	Station
<b>Administrative actions</b>	(1) Order to revise the Operational Safety Program (Article 37, Paragraph 3 of the Law for the Regulation of Nuclear Source Material, Nuclear Fuel Material and Reactors), (Nuclear)	<ul style="list-style-type: none"> <li>To strengthen involvement of the top management.</li> <li>To enhance independency of the Chief Engineer for Reactors.</li> <li>To assign unplanned withdrawal of control rods as an abnormal event.</li> </ul>	Seven power stations of the evaluation category I : <ul style="list-style-type: none"> <li>Hokuriku EPC, Shika NPS (Unit 1)</li> <li>Tokyo EPC, Fukushima Daiichi NPS (Unit 3)</li> <li>Tokyo EPC, Fukushima Daini NPS (Unit 4)</li> <li>Tokyo EPC, Kashiwazaki-Kariwa NPS (Unit 1)</li> <li>Chugoku EPC, Shimane NPS (Unit 1 and 2)</li> <li>Japan Atomic Power Co., Tsuruga NPS (Unit 1 and 2)</li> <li>Japan Atomic Power Co., Tokai Daini NPS</li> </ul>
	(2) Order to change the Safety Rule (Article 42, Paragraph 2 of the Electricity Utilities Industry Act), (Hydro and Thermal)	<ul style="list-style-type: none"> <li>The Chief Engineer shall be independent.</li> <li>Safety awareness education shall be improved.</li> <li>System to confirm procedures in order to notify the plan for construction work shall be established.</li> <li>Records and their storage shall be performed adequately. etc.</li> </ul>	Ten utilities of the evaluation category I : <ul style="list-style-type: none"> <li>Hokkaido EPC</li> <li>Tohoku EPC</li> <li>Tokyo EPC</li> <li>Chubu EPC</li> <li>Hokuriku EPC</li> <li>Kansai EPC</li> <li>Chugoku EPC</li> <li>Kyushu EPC</li> <li>Okinawa EPC</li> <li>Electric Power Development Co.</li> </ul>
	(3) Order to conform to the Technical Standards (Article 40 of the Electricity Utilities Industry Act), (Hydro)	The hydraulic power stations be shutdown and repaired so as to conform to the Technical Standards.	Two power stations of the evaluation category I : <ul style="list-style-type: none"> <li>Tokyo EPC, Komukawa third PS, Kamikurisawagawa Dam</li> <li>Hokuriku EPC, Ichinose PS, Nishitani Dam</li> </ul>
<b>special responses based on the comprehensive check</b>	(6) Special inspection during the nearest periodic inspection (Nuclear)	<ul style="list-style-type: none"> <li>In addition to the periodic inspection, the special inspection will be conducted.</li> <li>In the special inspection, availability of safety system will be confirmed during reactor outage.</li> </ul>	Seven power stations of the evaluation category I (Nine plants):
	(7) Special Nuclear Facilities Oversight Officer (Nuclear)	<ul style="list-style-type: none"> <li>NISA designates the Special Nuclear Facilities Oversight Officers, and conducts special oversight and supervision.</li> <li>Witness of routine inspections and enhanced inspections into compliance with the Operational Safety Program.</li> </ul>	7 power stations of evaluation category I
	(21) Implementation of onsite inspection (Hydro and Thermal)	Confirmation of conformity to Technical Standards	Hydro: 125 power stations Thermal: 5 power stations (* Regarding 7 hydro-power stations out of the above, actions are already taken.)

## **Responses (30 items)**

### **1. Administrative actions**

- (1) Order to revise the Operational Safety Program (Nuclear)
- (2) Order to revise the Safety Rule (Hydro and Thermal)
- (3) Order to conform to the Technical Standards (Hydro)

### **2. Requirements for utilities to prevent recurrence**

- (4) Development of action plans on measures to prevent recurrence

### **3. Requirement for manufacturers to improve safety**

- (5) Development of manufacturers' action plan for improving safety

### **4. Responses in the nuclear area**

- (6) Implementation of special inspection during the nearest periodic inspection
- (7) Special oversight of nuclear power stations by the special nuclear facilities oversight officer
- (8) Oversight on the alarm print out by the resident nuclear safety inspector
- (9) Thorough implementation of unescorted access to facilities by the resident nuclear safety inspectors
- (10) Clear definition in the Operational Safety Program concerning the management of compliance with laws and orders in the Operational Safety Program
- (11) Addition of measures to "measures to be taken for safety"
- (12) Establishment of the system assuring independency of the Chief Engineer for Reactors
- (13) Obliging the electric utilities to report withdrawal of control rods etc.
- (14) Disclosure of the results of safety inspections for nuclear power generating facilities
- (15) Promotion of international disclosure and sharing of information related to incidents and accidents
- (16) Holding of an international workshop concerning control rod withdrawal
- (17) Promotion of registering events in the "Nuclear Information Archives (NUCIA)"
- (18) Advancement of partial implementation of a new inspection system and to improve it
- (19) Oversight of information on operational data
- (20) Assurance of access to the information

### **5. Actions in the hydro and thermal areas**

- (21) Implementation of onsite inspection
- (22) Improvement in the description of the Safety Rule required by the Electricity Utilities Industry Act
- (23) Thorough implementation of education and training concerning laws/regulations and technology
- (24) Reinforcement of the roles of the Chief Engineer for Electricity and others
- (25) Reexamination of the codes and standards for thermal and hydro areas
- (26) Reinforcement of activities across departments
- (27) Appropriate reflection of lessons gained by other companies and industries
- (28) Study of a system to comply with the Safety Rule and others
- (29) Study of a system to conduct external evaluation on the Operational Safety activities at the utilities.
- (30) Improvement in the treatment of allegation in the hydro and thermal areas