Report on the impact of the Niigata-Chuetsu Offshore Earthquake on the Kashiwazaki-Kariwa Nuclear Plant and response by Tokyo Electric Power Company (TEPCO), national and local governments and other bodies (progress in October 2007)

Date	TEPCO and other power utilities and JANTI (Japan Nuclear Technology Institute)	National and local government
Monday 1 October	**TEPCO Press release: Progress report of internal inspection of No. 1 reactor (phase 2)** Notification of the results of the final verification of internal inspection of No. 1 reactor (Phase 2) <Inspection period> September 14 – October 1, 2007 <Scope of inspection> Upper part of reactor: flange reactor pressure vessel, guide rod, feed-water sparger, reactor core spray piping, reactor core spray sparger, core shroud upper ring, upper grid plate Middle part of reactor: reactor core support plate, fuel support clasp, jet pump, Pipe arrangement for low-pressure core infusion, local area output monitor, Inside of the pool for temporary placement of equipments: steam dryer, steam-water separator <Results of inspection> - No abnormality such as damage, deformation or dropout was found in the upper and middle parts of the reactor, or steam dryer, which was unloaded for regular inspection and temporarily placed in the pool used for temporally placement of equipments. - As a result of inspection conducted on 27 September concerning steam-water separator, which was unloaded for regular inspection and temporarily placed in the pool used for temporally placement of equipments, as in the case of steam dryer, deformations were identified in the feet used for temporary placement (4 of 4) and the guide pin (2 of 2) used to determine the location at the time of installation inside of the reactor. Te feet used for temporary placement and the guide pin are complementary equipments of steam-water separators and do not have impact on te functions or the structures. - In relation to the deformation of the feet of steam-water separator used for temporary placement, some damages were found on the floor of the pool used for temporary placement of equipments. However, no water leakage from the said area was identified. (Already notified on 27 September, 2007)	
Tuesday 2 October		**NISA press release: Survey/ Operation and management of countermeasure committee/ facility's integrity evaluation WG (2nd meeting)** <Venue> 11:00-11:30 2F, the Kashiwazaki-Kariwa Nuclear Power Station Disaster Prevention Center, Niigata Prefecture 12:30-13:30 Niigata Center, BWR Operator Training Center Co., Ltd. Simulated reproduction of response status on the operating floors in the case when K-4 and K-2 earthquake hit was executed at BTC. 13:45-15:45 Kashiwazaki-Kariwa Nuclear Power Station of TEPCO 16:15-17:15 2F, the Kashiwazaki-Kariwa Nuclear Power Station Disaster Prevention Center, Niigata Prefecture <Agendum> + On-site survey of the Kashiwazaki-Kariwa Nuclear Power Station
Friday 5 October		**Nuclear Safety Commission: Special committee on nuclear power safety standard/ policy** **On-site survey relating to protection from fire caused by earthquake at nuclear power stations conducted by the section meeting on protection measure against fire** Executed to grasp the current status of efforts made to reinforce protection measures against fire caused by earthquakes at power stations, in terms of both facility and management of nuclear power stations.
	TEPCO Press release: Regarding the result of inspections of main exhaust duct (aboveground and underground parts) <Outline of non-conformances> - Inspection was started from 10 September concerning the creeps of main exhaust duct of Nos. 1 through 5 reactors caused by the impact of the earthquake. As a result, cracks were identified in 2 parts of 18 parts of the bellows (already notified on 17 July and 11 September). - Then, inspection of underground main exhaust ducts of Nos. 2, 4, and 5 reactors (no underground exhaust duct exists in Nos. 1 and 3 reactors) was started on 2 October. As a result of the inspections, some creeps of duct covers were confirmed as regards 9 parts of 16 parts of bellows. As a result of inspection of the said 9 parts by detaching the duct covers, no abnormality in particular was	**NISA press release: Impact of Earthquake (Report No. 28)** - Received information from TEPCO as mentioned in the left - With respect to information provided at this time on the cracks in the main exhaust duct of No. 1 Unit, abrasion inside of the fuel pool of No. 7 unit, and the crack in the concrete inside of the water discharge channel of No. 7 unit, NIPA understands that necessary measures will be taken within the management mechanism against non-conformance by TEPCO. NIPA will continue to check such progresses. - Will continue to check if damages or significant deformations are found during inspections inside of the reactors from Unit No. 1 to 7.

identified although there was some deformation in the bellows inside the ducts.
- In addition, as regards the main exhaust stack duct (parts above ground), 7 cracks were newly identified in the same part of the same bellows as the one in which cracks were found in the previous inspection. (Maximum: about 2 cm, diameter of the duct: about 4 m, duct circumference : 13m)
- With respect to the 9 parts of the bellows in the underground parts of Nos. 2, 4 and 5 reactors, where creeps were found, the concentration of radioactive materials, the concentration of surface contamination and radiation dose rate were measured before detaching the duct covers. Then, the concentration of surface contamination was measured in the parts where the duct covers were detached. No radioactive material was found in either part, and no impact of radioactivity to the outside was identified.
- Furthermore, with respect to the newly identified 7 cracks in the parts above ground of No. 1 reactor, the concentration of surface contamination was measured. No radioactive matter was detected in either part, and no impact of radioactivity to the outside was identified.

<Response>
Immediately implement temporary repairs of the cracks in the main exhaust duct (parts above ground) of No. 1 reactor.

- Inspectors of NIPA are currently engaged in work to verify detailed facts, such as causes of events, etc. with respect to the plant conditions surveyed by TEPCO.
- Currently, no significant change is found in the main exhaust stack radiation monitors or the monitoring posts.

TEPCO Press release: Regarding non-conformances in post-earthquake inspection and restoration program (weekly report dated 4 October)

Announcing the status of major inspections and restoration works (from September 30th to October 27th, 2007) and non-conformance at TEPCO's Kashiwazaki-Kariwa NPS after the Niigata-Chuetsu-Oki Earthquake.

1. Inspection/restoration Status

1. Inspection/ Restoration Status

+ Inspection and restoration completed between September 28th to October 4th, 2007
- Unit No.1 In-core inspection (Phase2):
  Inspection completed on October 1st
- Unit No.2 Reactor building ceiling crane inspection:
  Inspection to be completed on October 4th
- Unit No.5 Reactor building ceiling crane inspection:
  Inspection completed on September 28th
- Unit No.6 Reactor building ceiling crane inspection:
  Inspection completed on October 2nd
- Unit No.6 Turbine building ceiling crane inspection:
  Inspection to be completed on October 4th
- Unit No.7 Refueling floor service tools inspection (stud tensioners, etc.):
  Inspection completed on October 1st
- Unit No.7 Turbine building ceiling crane inspection:
  Inspection to be completed on October 4th
- Unit No.7 Removal of spent fuel pool underwater work platform:
  Inspection completed on September 30th
- Standby Gas Treatment System verification run:
  Inspection completed on October 2nd
- Fuel pool cooling water system back up pump verification run:
  Inspection completed on September 28th

+ Inspection to be commenced between to October 5th to October 11th, 2007.
- Unit No.1 House transformers (1B) inspection (oil extraction/ internal inspection)
- Unit No.1 Excitation transformers inspection (oil extraction/ internal inspection)
- Unit No.2 Restoration for the blowout panel of reactor building
- Unit No.4 Refueling floor service tools inspection (stud tensioners, etc.)
- Unit No.6 Turbine internal inspection
- Unit No.7 Preparation to transport main transformers out of the factory
- Unit No.7 In-core inspection
- Unit No.7 Turbine internal inspection
- Unit No.7 Main generator inspection
- Solid Waste Storage Facility soundness confirmation

2. Non-conformances Found in the Inspection and Restoration Works Performed after the Niigata-Chuetsu-Oki earthquake

This announcement contains incidents information reported from September 27th to October 3rd 2007 and the occurrence status of non-conformances (that have been deliberated) reported from September 20th to 26th, 2007.

1)Incidents Information (related to the Chuetsu offshore earthquake)

From Sept. 27th to October 3rd, 2007 (Total Figure from Aug. 10th, 2007)		Number of Incidents by Announcement Category (Total Figure from Aug. 10th, 2007)	
No. of Reported Events	0 (1)	I	0(0)
		II	0(0)
		III	0(1)

<Reports from September 27 to October 3rd , 2007>

Announcement Category	Date of Detection	Title of Report	Status
I	-	-	-
II	-	-	-
III	-	-	-

2) Information on Non-conformances (those related to : the Chuetsu offshore earthquake:; Grades As – non-graded)

From Sept. 20th to 26th, 2007 (Total Figure from July 16th, 2007)	
No. of Reported Incidents	24(2,850)

3) Other Findings

- Unit No.7 Visual inspection of inside the spent fuel pool in connection to the removal of the underwater work platform (removed on September 28th). Confirmed 4 minor scratches on the legs of the work platform legs, scratches on the handle of 3 fuel bundles, and minor scratch on the wall of the pool.
- Unit No.6 Completed post-restoration inspection for 3 parts of damage to the reactor building ceiling crane drive joint (inspection completed and begun use of the crane on October 2nd).
- Units No.6 and No.7 Confirmed crack inside the discharge canal concrete during inspection.

Tuesday 9 October	**TEPCO Press release: Regarding the detection of well liner drainage water of No.7 reactor** On 8 October 2007, it was found that water was collected inside of the level gauge of the pipe arrangement connected to the well liner of the reactor. As a result of monitoring the tendency of water collected in the level gauge, and analyzing the water collected in the level gauge, traces of radioactive materials (antimony 124, etc.) were detected. Consequently, we assumed that the water detected was part of water used for filling the upper part of the reactor that was discharged into the level gauge through the liner. Discharge of water into the level gauge is continuing even now (approx. 500 cc /hour). In the days ahead, it is planned to remove the fuel and conduct inspection of the reactor core and the exposed parts, as well as the liner. No impact of radioactivity to the outside was caused by this incident.	**Nuclear Safety Commission: On-site survey of the Kashiwazaki-Kariwa Nuclear Power Station by the committee members** Executed on-site verification concerning the state of facilities of the power station (Locations where on-site verification was conducted) No. 7 unit: + Reactor building - Operating floor (verification of the alignment of fuel and control rod) - Upper part of dry well - Residual heat removal system pump chamber (B) - + Turbine building operating floor
Thursday 11 October	**TEPCO Press release: Regarding" The Report on Failures at Nuclear Reactor Facilities" in relation to the impact of the Niigata Chuetsu offshore earthquake** The Tokyo Electric Power Company, Inc. submitted reports regarding the following items to the Minister of Economy, Trade and Industry in accordance with "Article 19-17, Rules on the Installation, Operation and Others of Commercial Power Rectors". 1. Leakage of water containing radioactive materials into the non-controlled areas in the Unit 6 reactor building [Outline of the Event] It was confirmed that, on the refueling floor of fourth of the reactor building (controlled area), a sloshing (stirring of water surface caused by seismic motion) due to the Niigata-Chuetsu-Oki Earthquake had caused the water containing radioactive materials to flow out of the spent fuel pool into the mezzanine floor (non-controlled area) between the second and third floors through a electrical wire conduit tube connected to the power supply box of the refueling machine, and then run down into the third floor (non-controlled area) and into the non-radioactive drainage collecting tank on the first basement (non-controlled area), and had been finally released into the	**NISA press release: Impact of Earthquake (Report No. 29)** - Received report and information from TEPCO as mentioned in the left. - With respect to leakage of water containing radioactive materials into the non-controlled areas in reactor building in Unit No. 6, inundation on the operating floors of reactor buildings in Units Nos. 1 to 7, damaged travel transmission joints of the overhead traveling crane in the reactor building of Unit No. 6, the study / countermeasure committee in charge of nuclear power stations affected by the Niigata Chuetsu Offshore Earthquake, and its working groups will examine these issues in detail. Furthermore, as regards other reported non-conformances, we will check countermeasures for the prevention of recurrence of events and so on to be executed by TEPCO in the future.

sea through the discharge outlet. The amount of water released and its radioactivity was estimated to be about 1.2m3 and about 9×10^4 Bq, respectively.

[Possible Causes]

Based on the results of our investigations, we estimated the cause of the leakage of water containing radioactive materials into the non-controlled areas to be as follows:

- The water flowed into the power supply box leaked into the electrical wire conduit tube through a clearance which was formed by either insufficient design consideration or a defective seal in the tube penetration of the power supply box.
- The water which ran into the embedded electrical wire conduit tube dripped from the upper air conditioning duct of the mezzanine floor and onto the surface of the third floor through the opening of the mezzanine floor.

As a result, we estimated that the water which dripped down onto the surface of the third floor had flowed through the drain port on the third floor into the non-radioactive drainage collecting tank placed on the first basement, and subsequently had been released by the drain pump into the sea through the discharge outlet.

[Preliminary Measures]

As an emergency measure, the tube penetration of the power supply box in the refueling machine placed on the forth operating floor of the reactor building was refilled with a sealant to improve its sealing characteristic.

The leaked water was completely wiped off from the floors. The water accumulated in the non-radioactive drainage collecting tank on the first basement of the reactor building was transferred by means of a temporarily installed pump into the high-conductivity effluent collecting tank placed within the controlled area in the turbine building, and treated in the liquid waste treatment system. For the radioactive water which was released from the non-radioactive drainage collecting tank on the first basement of the reactor building into the sea through the discharge outlet, safety measures were taken so as to ensure that the drain pump on the tank would not automatically start. In the future, we plan to execute decontamination works for the water leakage route.

As permanent measures, we will consider design and structural improvements to be made for the tube penetration of the power supply box to be impermeable. In each plant, investigations will be made also on penetration between controlled and non-controlled areas to improve their sealing characteristics, if necessary.

2. Inundation on the operating floors of reactor buildings in Units Nos. 1 to 7

[Outline of the Event]

Following the Niigata-Chuetsu-Oki Earthquake that occurred on July 16, 2007, our team begun surveying the site of the nuclear power station at around 11:00 a.m. on the day. As a result, it was confirmed that the entire refueling floors (controlled area) of the reactor buildings in Units 1 to 7 were inundated with water that flowed out of their respective spent fuel pool. For all units, analyses of the water that flowed out confirmed that radioactive materials were contained.

- Unit 1 (Approx. 4.1×10^0 bq/cm^3)
- Unit 2 (Approx. 6.7×10^1 bq/cm^3)
- Unit 3 (Approx. 7.8×10^1 bq/cm^3)
- Unit 4 (Approx. 2.6×10^1 bq/cm^3)
- Unit 5 (Approx. 1.9×10^1 bq/cm^3)
- Unit 6 (Approx. 1.4×10^1 bq/cm^3)
- Unit 7 (Approx. 2.7×10^1 bq/cm^3)

[Possible Causes]

Based on the results of investigations, we estimated that the inundations on the refueling floors of the reactor buildings in Units 1 to 7 had been caused by the water that flowed out of their respective spent fuel pools due to the seismic sloshing.

[Preliminary measures]

The water that had flowed out of the spent fuel pool onto the refueling floors in Units 1 to 7 was completely wiped off and decontaminated by July 27.

Based on results of investigations and reviews on seismic measures to be conducted, we will take necessary measures in the future.

3. Damaged travel transmission joints of the overhead traveling crane in the reactor building of Unit No. 6

[Outline of the Events]

After the Niigata-Chuetsu-Oki earthquake occurred on July 16, 2007, during equipment inspection conducted on July 24, damages were confirmed in 4 out of 2 wheel-side cross-pins on the south-side and north-side travel gears for the overhead traveling crane driving shaft. On August 3, subsequent investigations and checking works also detected that one motor-sided cross pin of the travel transmission joint mounted on the south-side travel gear had been damaged; totaling 3 out of 4 cross pins that were damaged.

The joints with damaged cross pins were removed, and submitted for a fractography examination. The results indicated no sign of metal fatigue or any rust sticking considered as a trail of corrosion was found on the fracture surfaces.

[Possible Causes]

Based on the results of the investigations, we estimated that the travel transmission joints of the overhead traveling crane in the reactor building of Unit No. 6 were damaged by the following causes:

- When the earthquake occurred, the overhead traveling crane was at a halt with brakes stopping the traveling wheels.
- The seismic motion forced the traveling wheels of the overhead traveling crane in the reactor building to move with brakes still stopping the traveling wheels.
- Since the traveling force of the crane was blocked by the wheel brake, it led to an excessive force on the transmission joints placed between the traveling wheels and the motor and caused the damage.

[Preliminary Measures]

The set of travel transmission joints with damaged cross pins were replaced with new products (of the same model).

A detailed evaluation of seismic loads will be conducted accordingly.

- Continue to check if any damage or significant deformation is found during the inspections of inside of the reactors in Units Nos. 1 to 7.
- Inspectors of NIPA are currently engaged in work to verify detailed facts, such as causes of events, etc. with respect to the plant conditions surveyed by TEPCO.
- Currently, no significant change is found in the main exhaust stack radiation monitors or the monitoring posts.

NISA: Chuetsu Oki Earthquake Nuclear Power Plant Investigation and Countermeasures Committee
WG on internal fire protection systems and incident reporting structures in relation to the Chuetsu oki earthquake (3rd session)

Issues relating to:

(1) Liaison and communication structures
(2) Internal fire protection
(3) Other

TEPCO Press Release: Non-conformances Found in the Inspection and Restoration Works Performed after the Niigata-Chuetsu-Oki Earthquake (Weekly report dated October 11th)

We are announcing the status of major inspections and restoration works (from October 7th to November 3rd, 2007) and non-conformance at TEPCO's Kashiwazaki-Kariwa NPS after the Niigata-Chuetsu-Oki Earthquake.

1. Inspection/Restoration Status

+ Inspection and restoration completed between October 5th to 11th, 2007
  - Unit No. 2, 4 and 5 Main exhaust ducts inspection (in-trench duct): Inspection completed on October 5th
  - Unit No. 4 Turbine building ceiling crane inspection: Inspection completed on October 5th
  - Unit No. 6 Main transformers inspection (oil extraction/inner inspection): Inspection completed on October 6th
  - Unit No. 7 Reactor head opening: Inspection completed on October 8th
  - Unit No. 7 Discharge canal inspection: Inspection completed on October 10th
+ Inspection to be commenced between to October 12th to October 18th, 2007.
  - Unit No. 1 Excitation transformers inspection (oil extraction/inner inspection)
  - Unit No. 2 House transformers (2A) visual inspection preparation
  - Unit No. 2 Removal of spent fuel pool underwater work platform
  - Unit No. 3 Main transformers inspection (oil extraction/inner inspection)
  - Unit No. 3 House transformers (3A) inspection preparation and inspection (oil extraction/inner inspection)
  - Unit No. 3 Excitation transformers visual inspection
  - Unit No. 3 Restoration for the blowout panel of turbine building
  - Unit No. 7 Main generator inspection
  - Inspection of low-voltage start-up transformer 3SA (oil extraction/inner inspection preparation)
  - Dismantling of Arahama-side arrestor steel tower
+ Work Schedule for Major Inspection/Restoration from October 7th to November 3rd, 2007
  - Work Schedule of the Main Inspection/Restoration of Kashiwazaki-Kariwa Nuclear Power Station in Response to the Niigata-Chuetsu-Oki Earthquake (during 4 Weeks)

2. Non-conformances Found in the Inspection and Restoration Works Performed after the Niigata-Chuetsu-Oki Earthquake

Incidents information reported from October 4th to 10th, 2007 and the occurrence status of non-conformances (that have been deliberated) reported from September 27th to October 3rd, 2007.

1) Incidents Information (relating to the Chuetsu-Oki Earthquake)

From October 4th to 10th , 2007 (Total Figure from Aug. 10th , 2007)		Number of Incidents by Announcement Category (Total Figure from Aug. 10th, 2007)	
No. of reported events	1 (2)	I	0(0)
		II	0(0)
		III	1(2)

<Reports from October 4th to 10th, 2007>

Announcement Category	Date of Detection	Title of Report	Status
I	-	-	-
II	-	-	-
III	October 9th 2007	Detection of drain water from the well liners at the Nuclear Power Station Unit No. 7	Detection of radioactive water flowing in through the liner into the level gauge, when filling the upper reactor. (about 500cc/ hour, with radioactivity)

2) Information on Non-conformances (those related to: the Chuetsu-Oki Earthquake; Grades As - non-graded)

From Sept. 27th to October 3rd, 2007 (Total Figure from July 16th, 2007)	
No. of Reported Incidents	22(2,872)

3) Other Findings

Unit No. 2, 4 and 5: Observed creeps of ducts at 9 bellows out of 16 when inspecting the underground part of main exhaust ducts. No abnormality found despite deformation of bellows. No radioactive materials detected at the creeps at 9 bellows as a

	result of the measurement of surface contamination concentration, and there is no impact of radioactivity on the outside. Unit No. 1 and 3: Re-checked the aboveground part of main exhaust ducts with the increased number of air blower/ evacuator machines and newly observed 7 cracks at Unit 1. No radioactive materials detected at the cracks as a result of the measurement of surface contamination concentration, and there is no impact of radioactivity on the outside. The 7 cracks have been temporarily fixed on October 4th. **TEPCO Press Release: Geological surveys planned at the premises of Kashiwazaki-Kariwa Nuclear Power Station (NPS) and adjoining land area (Second survey of land area)** (1) Execution of survey of soil deformability in order to assess subsidence and liquefaction of ground caused by the late earthquake, which had been not yet determined. - Make assessment of subsidence and liquefaction of ground in the power station premises, which will be reflected in the repair works in the future - Survey of ground deformation will cover an extensive area encompassing the Nagaoka Plain Western Rim Fault Zone in addition to the immediate land area adjoining the Nuclear Power Station premises, which will be reflected in the evaluation of seismic safety. (2) Execution of survey of representative faults in the Power Station premises and immediate areas adjoining the Power Station taking into account views of the community - Execute survey of faults in the power plant premises and immediate areas adjoining the power plant premises, which will be reflected in the evaluation of seismic safety	
Friday 12 October		**NISA: seismic and structural design sub-committee joint earthquake, tsunami, geology and ground WG (1st session)** 3. Issues relating to: (1) Scope of investigation into the seismic resistance of and safety levels at the Kashiwazaki-Kariwa nuclear facility during the Chuetsu oki earthquake in Niigata prefecture (2) Progress of the investigation into the seismic resistance of and safety levels at the Kashiwazaki-Kariwa nuclear facility during the Chuetsu oki earthquake in Niigata prefecture
Monday 15 October	**TEPCO Press Release: Establishment of the "Countermeasure Center for the Niigata Chuetsu Offshore Earthquake" and reinforcement of disaster prevention structure at the Nuclear Power Station** TEPCO will execute internal reorganization of the company as follows in order to further strengthen the post-earthquake responses following the Niigata Chuetsu offshore earthquake. + Establishment of the "Countermeasure Center for the Niigata Chuetsu Offshore Earthquake" The "Countermeasure Center for the Niigata Chuetsu Offshore Earthquake" will be newly established in the Nuclear Power Plant Management Department of the headquarters as of October 15th. "Countermeasure Center for the Niigata Chuetsu Offshore Earthquake" will be newly established in order to unify the functions of executing the response operations to Niigata Chuetsu Offshore Earthquake and supporting the Nuclear Power Station, as well as further improve the quality of service and ensure safety. From now on, the Nuclear Power Station and the headquarters will work as one to forcefully promote the inspection/ restoration of the facility and examination of seismic safety, with the "Countermeasure Center for the Niigata Chuetsu Offshore Earthquake" as the central player. + Reinforcement of disaster prevention system at the nuclear power station Currently, each department at the Nuclear Power Station is mainly in charge of disaster prevention efforts against natural disasters such as tyhoon (sever tropical storms) and fires, as well as disaster prevention caused by nuclear power events such as release of radioactive materials to the outside. But, in the future, in order to realize "Disaster-resistant nuclear power station", we have decided to unify the disaster prevention system of nuclear power stations by the end of FY2007. Toward this goal, "Disaster Prevention and Safety Group" will be established in the Nuclear Power Station Management Department of the headquarters as of October 15th to prepare this program.	
Thursday 18 October	**TEPCO Press release: Internal inspection of No. 7 reactor** Workers began removing the fuel from the No. 7 reactor on October 11 to enable internal inspections. They then began removing the control rods, and found that one of the control rods could not be removed. All of the fuel next to this fuel rod has been removed. This does not impact on the safety of the fuel rod, which is securely supported by brackets. Investigation is continuing into the cause of the problem. **TEPCO Press release: Nonconformities identified in post-earthquake inspection and restoration program (Weekly report for October 18)** Notification of inspection and restoration process at Kashiwazaki-Kariwa Nuclear Power Plant following the Niigata Chuetsu oki earthquake (from October 14 to November 10 2007) including nonconformities 1. Inspection and restoration + Inspection/restoration work completed between October 12 and 18 - No. 1 reactor: removal of water from B5 floor of combined reactor chamber completed October 12 - No. 1 reactor: internal transformer (1B) oil clean-up/internal inspection completed October 12 - No. 1 reactor: excitation transformer oil clean-up/internal inspection completed October 18	**NISA Press release: Earthquake update (Report No. 30)** - Information received from TEPCO as per left-hand column - Information was received today that during the removal of fuel from the No. 7 reactor, which began on October 11, it was discovered that one of the fuel rods had become separated from the drive mechanism and consequently could not be removed. NISA will take action as appropriate based on the impending investigation by TEPCO. - NISA is still in the process of conducting internal inspections of the Nos. 1 through 7units to check for damage and significant deformation - NISA inspectors are currently investigating the causes and other details at the plants based on TEPCO findings - There are no significant changes in the main exhaust stack radiation monitor and monitoring posts

- No. 2 reactor: inspection of fuel exchanger completed October 16
- No. 2 reactor: inspection of operating floor service tools (such as stud bolt tensioner) completed October 13
- No. 2 reactor: removal of underwater workbench from spent fuel pool to be completed by October 18
- No. 5 reactor: inspection of ceiling crane in turbine building – completed October 17

+ Inspection/restoration work due to commence between October 19 and 25 2007

- No. 1 reactor: inspection of fuel exchanger
- No. 2 reactor: opening of reactor and internal inspection
- Nos. 2, 6 and 7 reactors: preliminary preparations for inspection of reactor vessels
- No. 2 reactor: exterior inspection of internal transformer (2A), oil clean-up and preparations for internal inspection
- No. 2 reactor: preparations for external inspection of internal reactor (2B)
- No. 3 reactor: inspection of operating floor service tools (such as stud bolt tensioner)
- No. 3 reactor: preparations for internal inspection and oil clean-up of excitation transformer
- No. 4 reactor: inspection of fuel exchanger
- No. 5 reactor: opening of reactor
- No. 5 reactor: confirmation of conditions inside turbine
- No. 7 reactor: inspection of main power generator
- No. 7 reactor: preparations for internal inspection and oil clean-up of internal transformers (7A, 7B)
- Oil clean-up and internal inspection of low startup transformer 3SA

2. Nonconformities identified in inspection/restoration work following the Niigata Chuetsu oki earthquake

Report of issues identified in the period 11 – 17 October 2007 and nonconformities (as per discussions) occurring in the period 4 – 10 October 2007

1) Issues related to the Chuetsu oki earthquake

11 - 17 October 2007 (cumulative total since 10 August 2007)		By category (cumulative total since 10 August 2007)	
No. of issues	0 (2)	I	0 (0)
		II	0 (0)
		III	0 (2)

<4 – 10 October 2007>

Category	Date identified	Name	Description
I	-	-	-
II	-	-	-
III	-	-	-

2) Nonconformities (related to Chuetsu oki earthquake: As excluded)

4 - 10 October, 2007 (cumulative total since 16 July 2007)	
No.	26 (2,898)

3) Other

- Report on inspection of solid waste storage drums, which began on October 9, will be provided during the next monthly progress report on inspection and restoration work
- The spent fuel pool of the No. 2 reactor was inspected in conjunction with the removal of the underwater workbench from the pool (completed October 17). Minor grating was discovered in two places on the legs of the workbench frame, and also on the sides of the pool (inspection to be completed on October 18)
- Inspection of the drainage channels in the Nos. 6 and 7 reactors revealed concrete cracking in the No. 7 reactor drainage channel (inspection completed October 10)

Sunday 21 October

TEPCO Press release: water leak in restricted area within No. 7 reactor building

Workers noticed water seeping from the wall in the vicinity of the elevator in a restricted area on the 2nd floor of the reactor building during a regular patrol on October 20, and also observed water collected on the floor.

Samples were immediately taken for analysis. No radioactivity was detected. The wall was repaired and cured in order to stem the seepage, which had not abated, and the outcome of the repairs was monitored.

Further water samples were taken on October 21. This time, radioactive substances were detected: cobalt 60 and cesium 137. The volume of water was approximately 6.5 liters, and the measured radioactivity was 250 Bq (equivalent to approximately 30 cm^3 of radon spa water). The water leak was confined to the restricted area, and there was no radiation impact beyond this area. The cause is

<table>
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<td>still under investigation.
The concrete wall is not designed to airtight or watertight specs; the cracks are extremely fine and are not considered to have any impact on the structural integrity or strength of the wall.</td>
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<td>Tuesday 23 October</td>
<td>TEPCO Press release: water leak in restricted area within No. 7 reactor building (continued)
(Water seeping from seams in concrete wall)
Further investigation revealed a minor amount of seepage from seams in the concrete floor at the northern end of the third floor of the reactor building. The water was analyzed and found to contain radioactive cobalt 60. The total volume was approximately 200 cm^3 and the measured radioactivity was 0.8 Bq (equivalent to 0.1 cm^3 of radon spa water). The water leak was confined to the restricted area, and there was no radiation impact beyond this area.
(Leakage into liner detection piping flow glass)
A check was performed on the internal walls of reactor well liner and spent fuel pool liner detection pipes where water had collected in the flow glass, as part of the wider investigation into leakage from the reactor well liner. Analysis of samples found traces of radioactive substances such as cobalt 60 and serium 137. The volume of water in the flow glasses was minimal. It was disposed of via the normal waste liquid treatment process. It did not enter pipes beyond this area.

No abnormality indicating a leakage has been found in the water level of the spent fuel pool or in the level gauge of pipes connected to the pool liner.</td>
<td>NISA: WG on Seismic Safety and Structural Design (6th session)
Topics
(1) Investigation of seismic safety standards at the Kashiwazaki-Kariwa nuclear facility in the Niigata Chuetsu oki earthquake
(2) Screening standards and criteria employed in the construction permit</td>
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<td>Thursday 25 October</td>
<td>TEPCO Press Conference: nonconformities identified in post-earthquake inspection and restoration program (weekly report dated October 25)
Notification of inspection and restoration process at Kashiwazaki-Kariwa Nuclear Power Plant following the Niigata Chuetsu oki earthquake (from October 21 to November 17 2007) including
1. Inspection and restoration
+ Inspection/restoration work completed between October 19 and 25
- No. 2 reactor: reactor opening process – completed October 24
- No. 3 reactor: internal inspection and oil clean-up of internal transformer (3A) – completed October 22
- No. 5 reactor: inspection of fuel exchanger: completed October 19
- No. 5 reactor: inspection of operating floor service tools (such as stud bolt tensioner) completed October 19
- No. 6 reactor: internal check of turbine - completed October 25
- No. 6 reactor: removal of internal transformer to factory - completed October 25
- No. 7 reactor: removal of main transformer to factory - completed October 25
- Oil clean-up and internal inspection of low startup transformer 3SA - completed October 25
- Building preparation work - completed October 22
+ Inspection/restoration work due to commence between October 26 and November 1 2007
- Nos. 1, 3 and 5 reactors: preliminary preparations for inspection of reactor pressure vessels
- No. 1 reactor: general inspection of main transformer
- No. 1 reactor: preparations for internal inspection and oil clean-up of main transformer
- No. 2 reactor: preparations for removal and transportation of main transformer to factory
- No. 2 reactor: general inspection of internal transformer (2B); preparations for external and internal inspection and oil clean-up
- No. 3 reactor: oil clean-up and internal inspection of excitation transformer
- No. 5 reactor: internal inspection
- Nos. 5, 6 and 7 reactors: inspection of reactor pressure vessels
- No. 7 reactor: inspection of reactor well (commenced October 25)
- No. 7 reactor: inspection of main power generator

2. Nonconformities identified in inspection/restoration work following the Niigata Chuetsu oki earthquake
Report of issues identified in the period 18 - 24 October 2007 and nonconformities (as per discussions) occurring in the period 11 - 23 October 2007
1) Issues related to the Chuetsu oki earthquake
<table>
<tr><th colspan="2">18 - 24 October 2007
(cumulative total since 10 August 2007)</th><th colspan="2">By category (cumulative total since 10 August 2007)</th></tr>
<tr><td rowspan="3">No. of issues</td><td rowspan="3">1
(3)</td><td>I</td><td>0 (0)</td></tr>
<tr><td>II</td><td>0 (0)</td></tr>
<tr><td>III</td><td>1 (3)</td></tr>
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<td>NISA Press release: Earthquake update (31st report)
- Information/reports received from TEPCO as per left-hand column
- An in-depth investigation will be conducted into the circumstances behind the control rod that could not be removed, and also into the radioactive water leak within the reactor building
- Inspection of the Nos. 1 through 7 reactors for damage and significant deformation is continuing
- NISA inspectors are currently investigating the causes and other details at the plants based on TEPCO findings
- There are no significant changes in the main exhaust stack radiation monitor and monitoring posts</td>
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<4 - 10 October 2007>

Category	Date identified	Name	Description
I	-	-	-
II	-	-	-
III	20 Oct 07	Water leak in restricted area of No. 7 reactor building	Workers discovered water seeping from hairline cracks in seams in a concrete wall near the elevator in a restricted area on the 2nd floor of the reactor building. The volume of water was approximately 6.5 liters, and the measured radioactivity was 250 Bq. Further seepage was discovered from seams in the concrete floor on the 3rd floor on October 23. The volume was approximately 200 cm^3 and the measured radioactivity was 0.8 Bq. Neither case resulted in radioactive emission into the external environment.

2) Nonconformities (related to Chuetsu oki earthquake: As excluded)

11 - 23 October, 2007 (cumulative total since 16 July 2007)	
No.	49 (2,947)

3) Other

- Internal inspection of No. 7 reactor: removal of fuel rods completed October 23
- The No. 7 reactor control rod that could be removed (previously notified October 18) was successfully removed at approximately 11:37 a.m. on October 24 in accordance with the prescribed procedure for potential nonconformities. The cause of the difficulty in removing the control rod will be investigated.

  * Details of procedure

    Control rods are normally inserted and removed via a powered process, with hydraulics used for emergency insertion (known as a scram operation). The prescribed restoration procedure is designed for use in the event of nonconformities in the drive mechanism.

    After the standard powered removal operation was attempted on the recalcitrant control rod, the rods were all inserted using the hydraulic scram operation, then removed using the standard removal operation.

- As part of the investigation into the water leaking into the No. 7 reactor well liner drain, we have checked the spent fuel pool and other large liquid tanks of all reactors and tested for radioactive substances. At the present point in time, we have not discovered any significant water leaks (for instance, from the reactor well liner) other than in the No. 7 reactor.

  Nevertheless, water seepage from other walls is clearly irrefutable in light of the continuing leakage of water into the liner drain of the No. 7 reactor, and the fact that sloshing of water during the earthquake caused water to leak onto the operating floors in all reactors. As a result, continuing patrols will be necessary on an ongoing basis.

  A very minor volume of seepage was detected in the wall of the spent fuel pool below the operating floor in the No. 1 reactor, and was thought to be attributable to sloshing. Analysis found trace levels of radioactive substances. Monitoring is continuing.