Plant Status of Kashiwazaki-Kariwa Nuclear Power Station after the Niigata-Chuetsu-Oki Earthquake (as of August 10th)

Plant Status: All units were shutdown after the occurrence of the earthquake.

1. Visual Inspection Results After the Earthquake: A total of 65 incidents have been confirmed to date (excluding 4 incidents of reactor automatic scram due to the earthquake).

(1) Incidents related to radioactive materials (15 cases).

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Unit	Status Prior to Earthquake	Status at the Time of Earthquake	Cur
		Displacement of the duct connected to the main exhaust stack. Detailed investigation underway.	Investigation on the size of the displacement and being conducted.
Unit 1	Shutdown (in an outage)	Damage to fire protection system piping leading to a 40 cm-deep puddle of water on the B5 floor (the lowest floor, controlled area) of the Reactor Combination Building.	Amount of leakage: about 1,670m ³ . Confirmed r After repairing the fire protection system piping, Maximum amount of leakage: about 2,000m ³ .
		Water puddle on the reactor building refueling floor.	Completed soaking up water from the floor on Ju
	Startin a un	Displacement of the duct connected to the main exhaust stack8c . Detailed investigation underway.	Investigation on the size of the displacement and being conducted.
Unit 2	Starting up	Water puddle on the reactor building refueling floor.	Completed soaking up water from the floor on Ju
Lucit 2	Operating	Displacement of a duct connected to the main exhaust stack. Detailed investigation underway.	Investigation on the size of the displacement and being conducted.
Unit 3		Water puddle on the reactor building refueling floor.	Completed soaking up water from the floor on Ju
	Operating	Displacement of a duct connected to the main exhaust stack. Detailed investigation underway.	Investigation on the size of the displacement and being conducted.
Unit 4		Water puddle on the reactor building refueling floor.	Completed soaking up water from the floor on Ju
Unit 5	Shutdown	Displacement of a duct connected to the main exhaust stack. Detailed investigation underway.	Size of the displacement: about 4cm. Investigating whether there had been a leakage o
Unit 2 Unit 3	(in an outage)	Water puddle on the reactor building refueling floor.	Completed soaking up water from the floor on Ju
Unit 6	Shutdown	Minuscule amount of radioactivity found on the 3rd floor of the reactor building (0.6 liter; 2.8×10^{2} Bq) and mezzanine 3rd floor of the reactor building, which is an uncontrolled area (0.9 liter; 1.6×10^{4} Bq). Leaked water discharged to the sea via water discharge outlet (Total amount of discharged water: 1.2 m^{3} ; radioactivity: 9×10^{4} Bq; no change observed on the seawater radioactivity monitor.) No water is discharged at	Radionuclides discharged to the sea is as follows Cobalt-58: 7.7×10^3 Bq Cobalt-60: 4.3×10^4 Bq Antimony-124: 3.5×10^4 Bq
	(in an outage)	this moment. Water puddle on the reactor building refueling floor.	
Unit 7	Operating	Detected Iodine and particulate material (Cr-51 and Co-60) during a weekly periodic measurement of the main exhaust stack. Detected radioactivity: 3x10 ⁸ Bq. Water puddle on the reactor building refueling floor.	The measurements made on July 18 th detected the the period of July 19 th to July 23 rd no radioactive Detected radioactivity on July 20 th . Completed soaking up water from the floor on Ju

Appendix

urrent Status
d whether there had been a leakage of radioactivity is
re-leakage with radioactivity. g, depth of water is 48 cm.
July 27 th .
d whether there had been a leakage of radioactivity is
July 24 th .
d whether there had been a leakage of radioactivity is
July 20 th .
d whether there had been a leakage of radioactivity is
July 23 rd .
of radioactivity.
July 24 th .
/S:
July 23 rd .
he release of iodine-131 and iodine-133. However, for we material has been detected.
July 21 st .

(2) Incidents NOT related to radioactive materials (54 cases).

Unit 1 Surdium base. Investigating the size of the displacement of the control basic from the electrical instrument noom of the emergency dised generator (A) No departure from LCO since the unit LCO sinc		Status Prior		
Unit 1 Departure from Limiting Condition of Operation (LCO) due to low water level of specific flace pool and subsequent return to normal level. Small amount of oil leakage (still continuing) from the exciter power transformer, displacement from the Brandation base. No departure from LCO states the unit in Displacement form the Brandation base. Unit 1 Shardown (in an outloge) A paddle of vatere extending from the electrical information on or the energency due of power loss. No departure from LCO states the unit in power hand been materianed in Displacement (A) controlled network moundary doet to noncontrolled area. No signature from LCO states the unit in power hand been materianed in Displacement (A) controlled network moundary doet to noncontrolled area. No signature from LCO states the unit in power hand been materianed in Displacement (A) controlled network moundary doet noncontrolled area. No signature from LCO states the unit in power hand been materianed in Displacement (A) controlled network moundary doet network between hand the unit and inducted phase bas. Presentage of the joint: 10 locations, mail transformer. Notes (read alone) found on top of the bulk head inside the reactor well at the unit 1 reactor building refining the size of the displacement foor mound of the content prace. Planned to be picked up. (Liperaded not fool the displacement and the conter main printing (still continuing) Wradage of the displacement of exciter power transformer and the conter main printing (still continuing) Wradage of advaced on the displacement of the tarbage. Unit 2 Starting up Water intake screen woulding blowout panel. No takage of radiosacrivity, Temporalities (D)	Unit		Status at the Time of Earthquake	Cu
Unit 1 Small amount of oil leakage (still continuing) from the excitor power transformer, displacement from the foundation base. Instrument of oil leakage. Small a foundation base. Unit 1 Shutdown (in an outget) A paddle of water extending from the electrical instrument noon of the emergency died geterator (A) controlled noon boundary door to more-controlled net. No departure from 1.CO since the unit of the controlled net on boundary door to more-controlled net. Unit 1 Shutdown (in an outget) No impact on plant monitoring. No impact on plant monitoring. Displacement at the connection boundary lost to none-control pand. No impact on plant monitoring. No impact on plant monitoring. Displacement at the connection between bouse transformers 1A and 1B and isolated planse bus. Breakage of foundation boil. No impact on plant monitoring. Subsidience, State, crack and abruption of conceste, opening of the joint on the oil protection bank of transformer. Opening of the joint: 10 becations, maxin transformer. Unit 2 Starting up Reactor automatic serum due to carthquake. Planted to be picked up. (Upgraded not foundation boil. Unit 2 Starting up Water imake serve mashing pump unable to start. Reactor automatic serve of the displacement foundation boil. Unit 2 Starting up Water imake serve of the unitrue contor factor founet result inconting. No lakage of radiosectiviny		-		
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Unit 3 Operating Water intake screen washing pump unable to start. Restoration completed for 2 pumps on Ji Water intake screen washing pump unable to start. Displacement of the turbine building blowout panel. No leakage of radioactivity. Temporaril Oil leakage in the oil tank room of the turbine driven reactor feedwater pump (B). Amount of oil leakage: about 800 liters. Oil recovery completed on July 19 th . (Pu Subsidence and lateral displacement of the oil protection bank of transformer. Lateral displacement: one location; 2cm Reactor automatic scram due to carthquake. LCO due to low water level of spent fuel pool and subsequent return to normal level. Departure from the LCO due to displacement of the reactor building blowout panel and subsequent return to normal level. Displacement of the turbine building blowout panel. House transformer 3B caught on fire. Oil leakage from oil exhaust piping of K-3/4 low voltage start-up transformer (3SB). Unknown amount of oil leakage. Confirmed that oil leakage ceased on Jul			Lateral displacement of exciter power transformer foundation and duct for power bus.	Investigating the size of the displacement.
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Unit 3 Operating Within the LCO. Temporarily replaced the blowout panel. Displacement of the turbine building blowout panel. Temporarily replaced on July 20 th . House transformer 3B caught on fire. On July 16 at 10:15, house transformer 3 day. Oil leakage from oil exhaust piping of K-3/4 low voltage start-up transformer (3SB). Unknown amount of oil leakage. Confirmed that oil leakage ceased on July Confirmed that oil leakage ceased on July		Operating	LCO due to low water level of spent fuel pool and subsequent return to normal level.	
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Onit 3 Operating House transformer 3B caught on fire. On July 16 at 10:15, house transformer 3 day. Oil leakage from oil exhaust piping of K-3/4 low voltage start-up transformer (3SB). Unknown amount of oil leakage. Leakage continuing oil leakage. Confirmed that oil leakage ceased on July			within the LCO.	Temporarily replaced the blowout panel on July
Onit 3 Operating House transformer 3B caught on fire. On July 16 at 10:15, house transformer 3 day. Oil leakage from oil exhaust piping of K-3/4 low voltage start-up transformer (3SB). Unknown amount of oil leakage. Leakage continuing oil leakage. Confirmed that oil leakage ceased on July			Displacement of the turbine building blowout panel.	Temporarily replaced on July 20 th .
continuing oil leakage. Confirmed that oil leakage ceased on Jul				On July 16 at 10:15, house transformer 3B was for day.
			Oil leakage from oil exhaust piping of K-3/4 low voltage start-up transformer (3SB).	Unknown amount of oil leakage. Leakage contin continuing oil leakage.
				Confirmed that oil leakage ceased on July 23 rd .
Displacement in the exciter power transformer foundation and power bus duct. Investigating the size of the displacement			Displacement in the exciter power transformer foundation and power bus duct.	Investigating the size of the displacement.

urrent Status
of leakage continues.
d shutdown condition.Closed the double door after the to normal condition).
ased. No radioactivity.
ridth 7cm.
ll into the reactor well at the time of the earthquake. Trmance grade from C to B on Aug. 3^{rd} .)
oil removal. Leakage stopped by covering with filler.
red on July 20 th .
ge ceased. l on July 19 th .)
o a cold shutdown condition. y 21 st .
found on fire. Fire extinguished at 12:10 on the same
inuing. Low voltage start-up transformer shutdown due to

Unit	Status Prior to Earthquake	Status at the Time of Earthquake	Current Status
	Latinquake	Reactor automatic scram due to earthquake.	
11-14 4	Or contine	Leakage of seawater from a crack occurred in rubber flexible joint between condenser B seawater box and connecting valve.	Size of the crack: 3.5m. Amount of leakage: 24m ³ .
Unit 4	Operating	Service platform in the spent fuel pool fell on the spent fuel storage rack with spent fuels. No damage to the fuels.	Leakage ceased on July 19 th . Spent fuel pool water analyses confirmed there is no damage to
		Subsidence and tilt of the oil protection bank of transformer (partial opening of the joint).	Opening of the joint: one location; maximum width 20cm.
	Shutdown	Leakage from No. 4 filtered water tank.	Amount of oil leakage: about 900 m ³ . Leakage ceased. No radi
Unit 5	(in an outage)	Water intake screen washing pump unable to start.	
		Oil leakage from low voltage start-up transformer (6SB).	Low voltage start-up transformer shutdown due to small amoun Confirmed that oil leakage ceased on July 23 rd .
Unit 6	Shutdown (in an outage)	Dislocation of the service platform in the spent fuel pool.	Spent fuel rack is underneath the dislocated service platform; he Considering how to handle the situation.
		Reactor automatic scram due to earthquake.	Stabilization measures, such as fixing the wire to a handrail, have
Unit 7	Operating	Degradation of water tightness of the water-tight doors of the Reactor Core Isolation Cooling System and Residual Heat Removal Systems (A) and (C). Subsidence, slant, opening of the joint on the oil protection bank of transformer. Service platform in the spent fuel pool fell on the spent fuel storage rack with spent fuels. No damage to the fuels. Confirmed dropping of light fixture, dropping of ceiling decorative sheet, crack, displacement of emergency	Opening of the joint: 2 locations; maximum width 4cm. Spent fuel pool water analyses confirmed there is no damage to (Upgraded non-conformance grade from C to B on Aug. 3rd.)
		lighting, and opening of inspection door in the units 6/7 main control room.	
		500kV New Niigata 2L shut down. Slight gas leakage from breaker of 500kV New Niigata 2L.	Resumed operation on July 29th. Temporarily repaired with rubber bands. Restoration completed on July 28th.
Switch yard	—	Oil leakage from 500kV South Niigata 2L black phase bushing (South Niigata 2L shut down).	Unknown amount of oil leakage. Considering oil removal.
		Slippage of soil from the east-side slope.	Crack with width of about 10 cm.
Solid Waste Storage Warehouse	_	Several hundred drums in the solid waste storage warehouse tipped over and several tens of drums were found with their lids open.	No radioactive material detected from measurement of airborne locations of the solid waste storage warehouse. Confirmed water leakage from tipped over drums. Amount of le Soaked up leakage from the floor. Although no impact on external environment has occurred, all in warehouse were sealed on July 20th.
Administration Office Building	_	Normal power supply to the main office building were shut down. Power is supplied from emergency power source for the emergency response room, etc. No damage occurred to the building structure (columns and beams) of the office and information buildings. An expansion joint was damaged; many cracks occurred; many glass panes broke; the rooftop air conditioning unit was damaged; the waterproof tank was damaged; ducts fell; cooking equipment fell.	Power supply to the emergency response room has been restored

Current Status
there is no damage to fuels
um width 20cm.
kage ceased. No radioactivity.
n due to small amount of continuing oil leakage. 23 rd .
d service platform; however the platform is fixed on a wire.
wire to a handrail, have been taken on July 25^{th} .
m width 4cm.
there is no damage to fuels.
C to B on Aug. 3rd.)
ring oil removal.
asurement of airborne radioactive material concentration in 4 puse.
drums. Amount of leakage: 16 liters. No radioactivity.
ent has occurred, all intake and exhaust opening of the
oom has been restored to normal power.

Unit	Status Prior to Earthquake	Status at the Time of Earthquake	Curr
Site and others		 KK-1: West side of the turbine building KK-1: Near the fire hydrant adjacent to the diesel oil tank KK-2: Feed line to the service building KK-2: Feed line to the heat exchanger building The environmental minicomputer (Unit 1 service building) and telemeter transmission to the prefecture became disabled. The station road was cut off. Soil liquefaction occurred in a wide area of the site. 	No damage found on main frame. Restored on July 20 th . KK-1: Northeast side of the reactor building - rest KK-1: West side of the turbine building - restored KK-1: Near the fire hydrant adjacent to the diesel KK-2: Feed line to the service building - restored KK-2: Feed line to the heat exchanger building - 1 Restored telemeter transmission to the prefecture 18:00. Restoration completed on July 18 th at 18:00. Currently travelable. Size of crack: maximum about 8 cm. Maintenance work completed on August 2 nd . Restored on July 19 th .

2. Incidents found after start of detailed inspection.

Unit	Status Prior to Earthquake	Incidents Found after Start of Detailed Inspection	Curre
Unit 6	Shutdown (in an outage)		Breakage found on two couplings of the drive axis on July 24th). An additional breakage was found based on extern parts. Detailed inspection underway for other part

Current Status

	•
restored on July 18 th .	
bred on July 20 th .	
esel oil tank - restored on July 19 ^h .	
red on July 17 th .	
g - restored on July 20 th .	
ure on July 17 th at 15:40.Restored all system on July 18 th	• =
	• = 1
	. = 1
	•

urrent Status

xis of the unit 6 reactor building ceiling crane (published

ernal visual inspection for the relevant two breakage parts as well.

[Other Information]

- Total number of injured person at the Kashiwazaki-Kariwa site at the occurrence of the earthquake: 9. (no radiation exposure)
- Total number of injured person at the Kashiwazaki-Kariwa site after the occurrence of the earthquake: 2. (no radiation exposure)
- Reactor water analyses for units 2 through 7, which have fuels in the reactor core, confirmed there is no damage to fuels in the reactor core.
- Periodic measurements for radioactivity from the main exhaust stacks for units 1, 2, 3, 4, 5, and 6 confirmed there is no radioactivity.

• Periodic manual start-up surveillance testing of emergency diesel generators for each unit--totaling 20 diesel generators excluding one for unit 1 that has been under inspection since before the earthquake--were conducted and all were confirmed to be functional.

• Number of workers in the controlled area at the occurrence of the earthquake: 817. (unit1: 418, unit2: 6, unit3: 26, unit4: 1, unit5: 94, unit6: 270, unit7: 2)

Sixty-five workers were in the reactor building refueling floor inspecting the ceiling crane, preparing for the controlled area after confirming they were not contaminated by radioactive material. • At units 1 and 2, TEPCO ordered workers (about 400) to exit the controlled area without using the exit monitoring system after confirming that no one work wears for contaminated areas (C-clothes).

This action was taken from a human safety point of view because all but one exit monitoring system malfunctioned.

This is a legitimate action prescribed in the emergency procedure.

• The following incidents, all of which are presumed to be effects of rainfall, were found in the controlled area:

- A water puddle was found in the Low Pressure Condensate Pump Room at the B2 floor of the turbine building. Rainfall is suspected to have flowed in from the connection passage between the turbine building and the support building and subsequently (Unit 1) flowed into the B2 floor via B1 floor of the turbine building. No radioactivity has been detected. Completed transferring the water from the puddle to the waste processing system on July 26th. Confirmed no more inflow into the B1 floor of the turbine building on July 27th. Small amount of water continues to dribble into the connection passage between the turbine building and the support building. Recovery of water in the connecting passage underway on July 30th.
- (Unit 3) Water inflow found from the wall in the B1 floor of the turbine building. This water is presumed to have pooled in the pit adjacent to the turbine building and subsequently flowed into the turbine building. No radioactivity has been detected. Collected water that flowed in on July 26th. Confirmed no more inflow into the turbine building on July 27th.
- A water puddle suspected to have occurred from ground water due to rainfall was found near the boundary of the 1st building in the B1 floor of the solid waste storage warehouse and the administrative building. No radioactivity was detected. Completed (Solid Waste soaking up water from the floor on July 26th. Confirmed no more inflow on July 27th. Storage

Warehouse)

- (Support Building) A water puddle suspected to have occurred from ground water due to rainfall was found in the B1 floor of the support building. No radioactivity was detected. Confirmed no more inflow on July 27th. Completed soaking up water from the floor on July 27th.
- The following oil leakage incidents were identified inside the power station:
 - Small amount of oil film found at the unit 1 turbine building sub-drain and at the discharge outlet of units 1 to 4. Discharge from the sub-drain has been ceased and preparation is underway to process the drainage in a temporary tank. Oil film at the discharge outlet will continued to be monitored as the sub-drain drainage has been ceased.(Published on July 31st.) On July 31st, a temporary oil separation tank was installed and two-fold oil protection fences with adsorption mats were installed at the discharge outlet. (Published on August 1st.)
 - Crack found at the base of oil protection banks of units 1 to 3 transformers. Insulating oil is suspected to have infiltrated into the soil. Maximum estimated amount of insulating oil leakage: about 200 kl including those from transformers of other units that are yet to be examined thoroughly. Recovery of soil under and surrounding the oil protection banks is considered.
- At the unit 6 reactor building 4F refueling floor, a leakage of about 24 liter of hydraulic oil was found from the stud bolt tensioner*. Leakage ceased. Oil recovery and clean-up completed on August 7th.
- At the unit 4 reactor building 3F refueling floor, a leakage of about 200 liter of hydraulic oil was found from the stud bolt tensioner*. Leakage ceased. Oil recovery and clean-up completed on August 8th.
- * Hydraulic equipment used to constrict bolts that fix the upper head of the reactor pressure vessel.

• A water puddle was found on August 1st in the cable trench between the Unit 6 reactor building B1F (uncontrolled area) and the control building B2F (uncontrolled area). Amount of water: about 3 m3. No radioactivity.