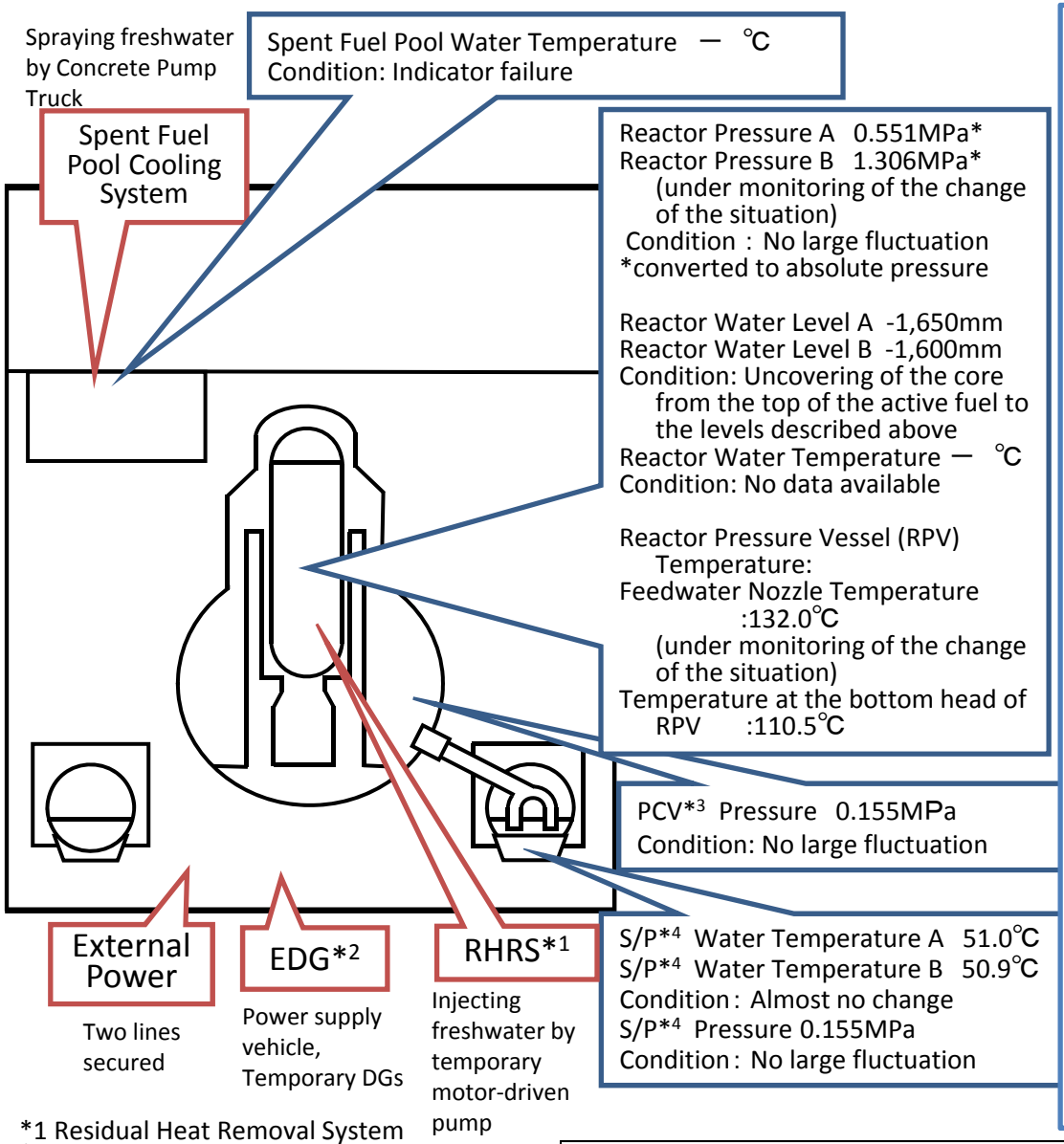
Conditions of Fukushima Dai-ichi Nuclear Power Station Unit 1
（As of 6:00 April 27th, 2011）



*1 Residual Heat Removal System
*2 Emergency Diesel Generator
*3 Primary Containment Vessel
*4 Suppression Pool

Major Events after the Earthquake

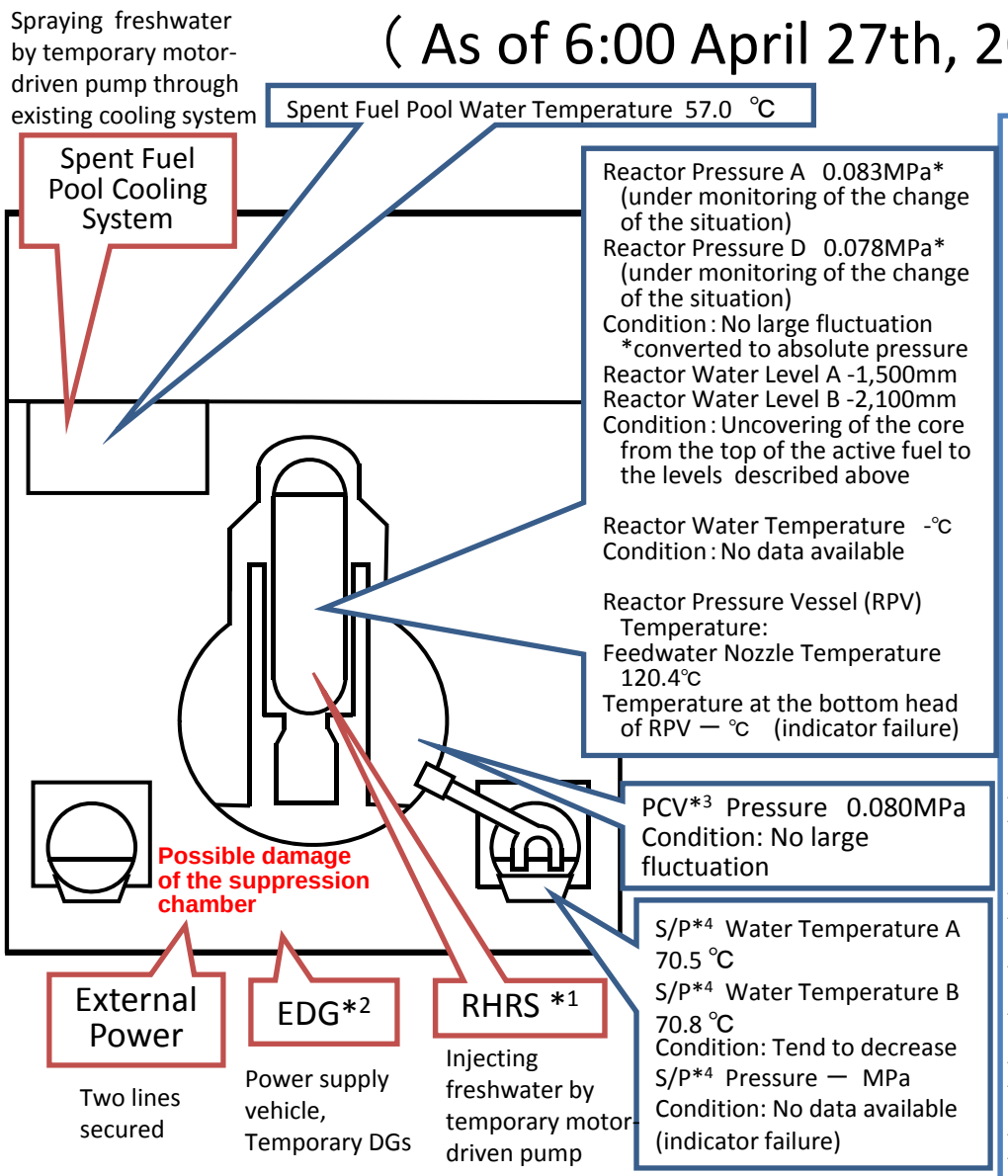
March 11th 14:46 Under operation, Automatic shutdown by the earthquake
March 11th 15:42 Report based on the Article 10 (Total loss of A/C power)
March 11th 16:36 Occurrence of the Article 15 event (Inability of water injection of the Emergency Core Cooling System)
March 12th 01:20 Occurrence of the Article 15 event (Unusual rise of the pressure in PCV)
March 12th 10:17 Started to vent.
March 12th 15:36 Sound of explosion
March 12th 20:20 Started to inject seawater and borated water to the Reactor Core.
March 23rd 02:33 The amount of injected water to the Reactor Core was increased utilizing the Feedwater Line in addition to the Fire Extinguish Line. ($2m^3/h \rightarrow 18m^3/h$)
09:00 Switched to the Feedwater Line only.($18m^3/h \rightarrow 11m^3/h$)
March 24th 11:30 Lighting in the Central Control Room was recovered.
March 25th 15:37 Started to inject fresh water.
March 29th 08:32 Switched to the water injection to the Reactor Core using the temporary motor-driven pump.
March 31st 12:00 ～2nd 15:26 Started to transfer the stagnant water from the Condensate Storage Tank (CST) to the Surge Tank of Suppression Pool Water (SPT)
March 31st 13:03～16:04 Water spray by Concrete Pump Truck (Fresh water)
April 3rd 12:02 The power supply to the temporary motor-driven pump was switched from the temporary power supply to the external power supply.
April 3rd 13:55 Started to transfer the water from the Condenser to CST.
April 6th 22:30 Started the operation for the injection of nitrogen to PCV.
April 7th 01:31 Confirmed starting the injection of nitrogen to PCV.
April 9th 04:10 Started using highly pure nitrogen generator in the injection of nitrogen to PCV.
April 10th 09:30 Completed transferring the water from the Condenser to CST.
April 11th around 17:16 Loss of external power supply due to an earthquake occurred (at Hamadori in Fukushima Prefecture) and water injection to the Reactor Core and nitrogen injection to PCV were suspended.
April 11th 17:56 External power supply was recovered.
April 11th 18:04 Resumed injecting water to the Reactor Core.
April 11th 23:19 Restarted operation for injecting nitrogen to PCV.
April 11th 23:34 Confirmed starting injection of nitrogen to PCV.
April 17th 16:00～17:30 Confirmed the situation in the reactor building using an unmanned robot.
April 18th 11:50～12:12 Stopped the water injection into the reactor core to replace the current hose with a new one.
April 19th 10:23 Completed the work of strengthening connection of the power supplies between Units 1-2 and Units 3-4.
April 25th 10:57 ～18:25 For reinforcement work of the power supply, the power supply to the pump injecting water into the reactor core was temporarily switched from the external power supply to the temporary diesel generator.
April 25th 14:10～19:10 Suspended nitrogen injection due to reinforcement work of the power supply.
April 25th 14:44～17:38 Implemented reinforcement work of the power supply (connection of the power supplies between Units 1-2 and Units 5-6).
April 25th 11:35～13:24(approx.) Observed the situation in the reactor building using unmanned robots.

Current Conditions : Fresh water is being injected to the Spent Fuel Pool and the Reactor Core

(Editorial committee for Nuclear Energy Handbook, Nuclear Energy Handbook)

Conditions of Fukushima Dai-ichi Nuclear Power Station Unit 2

（As of 6:00 April 27th, 2011）



*1 Residual Heat Removal System
*2 Emergency Diesel Generator
*3 Primary Containment Vessel
*4 Suppression Pool

Current Conditions：Fresh water is being injected to the Spent Fuel Pool and the Reactor Core

(Editorial committee for Nuclear Energy Handbook, Nuclear Energy Handbook)

Major Events after the Earthquake 1/2

March 11th 14:46 Under operation, Automatic shutdown by the earthquake
March 11th 15:42 Report based on the Article 10 (Total loss of A/C power)
March 11th 16:36 Occurrence of the Article 15 event (Inability of water injection of the Emergency Core Cooling System）
March 13th 11:00 Started to vent.
March 14th 13:25 Occurrence of the Article 15 event (Loss of reactor cooling functions）
March 14th 16:34 Started to inject seawater to the Reactor Core.
March 14th 22:50 Occurrence of the Article 15 event (Unusual rise of the pressure in PCV)
March 15th 00:02 Started to vent.
March 15th 06:10 Sound of explosion
March 15th around 06:20 Possible damage of the suppression chamber
March 20th 15:05～17:20 Approximately 40 ton seawater injection to the Spent Fuel Pool (SFP) via the Fuel Pool Cooling Line (FPC)
March 20th 15:46 Power Center received electricity.
March 21st 18:22 White smoke generated. The smoke died down and almost invisible at 07:11 March 22nd.
March 22nd 16:07 Injection of around 18 tons of seawater to SFP
March 25th 10:30～12:19 Sea water injection to SFP via FPC
March 26th 10:10 Started to inject fresh water to the Reactor Core.
March 26th 16:46 Lighting in the Central Control Room was recovered.
March 27th 18:31 Switched to the water injection to the core using the temporary motor-driven pump.
March 29th 16:30～18:25 Switched to the temporary motor-driven pump injecting fresh water to SFP.
March 29th 16:45～1st 11:50 Transferred the water from the Condensate Storage Tank (CST) to the Surge Tank of Suppression Pool Water (SPT)
March 30th 9:25～23:50 Confirmed malfunction of the temporary motor-driven pump injecting fresh water to SFP(9:45). Switched to the injection using the fire pump Truck, but suspended as cracks were confirmed in the hose. (12:47, 13:10) Resumed injection of fresh water(19:05)
April 1st 14:56～17:05 Freshwater injection to SFP via FPC using the temporary motor-driven pump.
April 2nd around 9:30 The water, of which the dose rate was at the level of more than 1,000mSv/h, was confirmed to be collected in the pit located near the Intake Channel of Unit 2. The outflow from the lateral surface of the pit into the sea was also confirmed.
April 2nd 17:10 Started to transfer the water from the Condenser to the CST.
April 3rd 12:12 The power supply to the temporary motor-driven pump was switched from the temporary power supply to the external power supply.
April 3rd 13:47～14:30 20 bags of sawdust, 80 bags of high polymer absorbent and 3 bags of cutting-processed newspaper were put into the Pit for the Conduit.
April 4th 7:08～7:11 Approximately 13kg of tracer (bath agent) was put in from the Pit for the Duct for Seawater Pipe.
April 4th 11:05～13:37 Freshwater injection to SFP via FPC using the temporary motor-driven pump.
April 5th 14:15 Tracer is confirmed to outflow through the permeable layer around the pit into the sea. 15:07 Started to inject coagulant.
April 6th around 5:38 The water outflow from the lateral surface of the pit was confirmed to stopped.
April 7th 13:29～14:34 Freshwater injection to SFP via FPC using the temporary motor-driven pump.
April 9th 13:10 Completed transferring the water from the Condenser to CST.
April 10th 10:37～12:38 Freshwater injection to SFP via FPC using the temporary motor-driven pump .
April 11th around 17:16 Loss of external power supply due to an earthquake occurred (at Hamadori in Fukushima Prefecture). Water injection to the Reactor Core was suspended.
April 11th 17:56 External power supply was recovered.
April 11th 18:04 Resumed injecting water to the Reactor Core.

Major Events after the Earthquake 2/2

April 12th 19:35～April 13th 17:04 Transfer from the trench of the turbine building to the Condenser.

April 13th 11:00 Suspended the transfer for checking leaks, etc.

April 13th 13:15～14:55 Freshwater injection to SFP via FPC using the temporary motor-driven pump.

April 16th 10:13～11:54 Freshwater injection to SFP via FPC using the temporary motor-driven pump. (The temporary motor-driven pump stopped at 11:39 due to an earthquake that occurred at around 11:19. SFP was confirmed to be filled to capacity through observing a rise of the water level in the Skimmer Tank.)

April 16th around 11:19 An earthquake occurred (in the southern part of Ibaraki Prefecture).

April 18th 13:42～ Confirmed the situation in the reactor building using an unmanned robot.

April 18th 12:13～12:37 Stopped the water injection into the reactor core to replace the current hose with a new one.

April 18th 09:30～17:40 Injected coagulant (soluble glass) into the power cable trench.

April 19th 08:00～15:30 Injected coagulant (soluble glass) into the power cable trench.

April 19th 10:08～ Started to transfer the stagnant water with high-level radioactivity from the trench of the turbine building to the buildings of radioactive waste treatment facilities.

April 19th 10:23 Completed the work of strengthening connection of the power supplies between Units 1-2 and Units 3-4.

April 19th 16:08～17:28 Injected freshwater to SFP via FPC using the temporary motor-driven pump.

April 22nd 15:55～17:40 Injected freshwater to SFP via FPC using the temporary motor-driven pump.

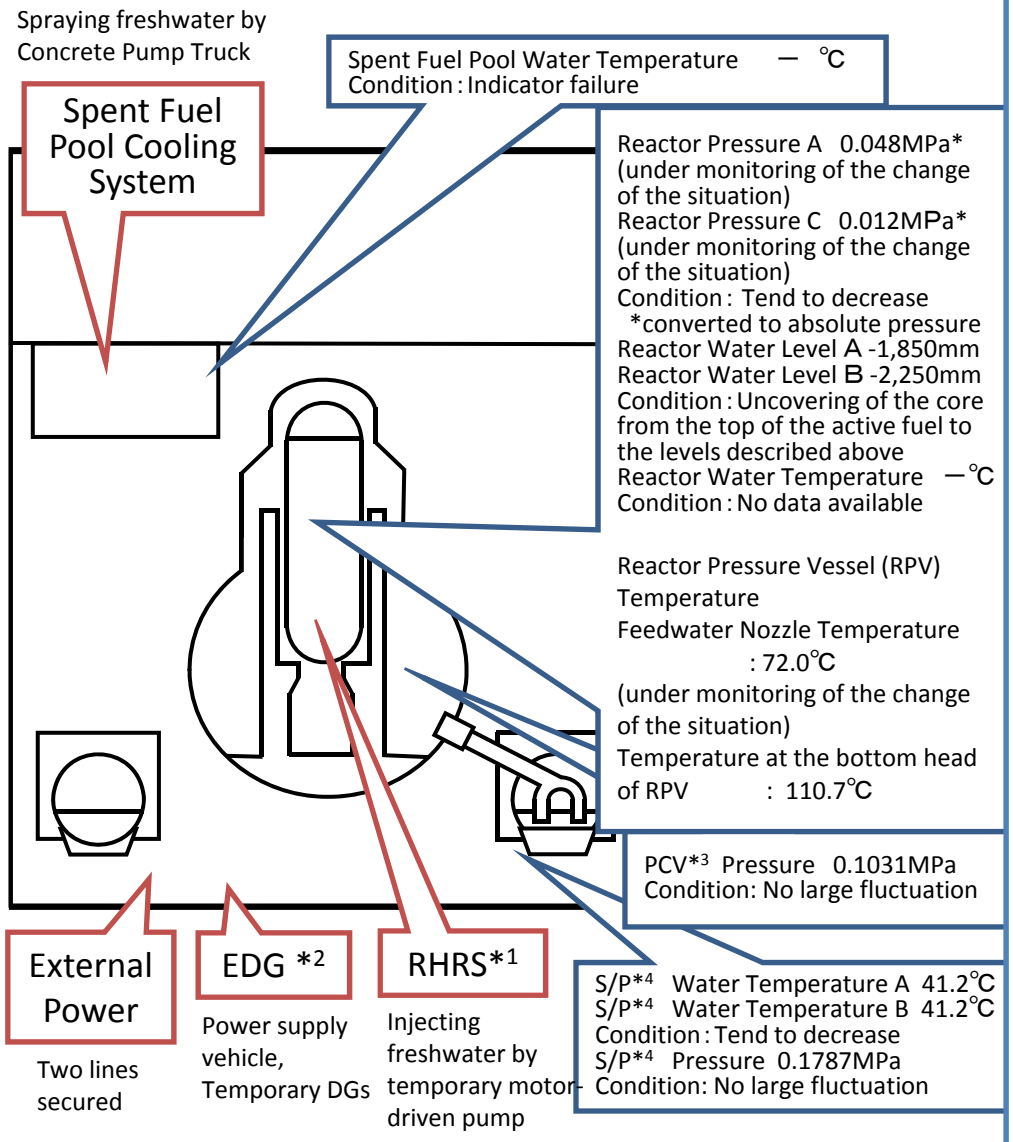
April 25th 10:12～11:18 Injected freshwater to SFP via FPC using the temporary motor-driven pump.

April 25th 10:57～18:25 For reinforcement work of the power supply, the power supply to the pump injecting water into the reactor core was temporarily switched from the external power supply to the temporary diesel generator.

April 25th 10:12～11:18 Injected freshwater to SFP via FPC using the temporary motor-driven pump.

April 25th 14:44～17:38 Implemented reinforcement work of the power supply (connection of the power supplies between Units 1-2 and Units 5-6).

Conditions of Fukushima Dai-ichi Nuclear Power Station Unit 3
（As of 6:00 April 27th, 2011）



*1 Residual Heat Removal System
*2 Emergency Diesel Generator
*3 Primary Containment Vessel
*4 Suppression Pool

Current Conditions : Fresh water is being injected to the Spent Fuel Pool and the Reactor Core

(Editorial committee for Nuclear Energy Handbook, Nuclear Energy Handbook)

Major Events after the Earthquake 1/2

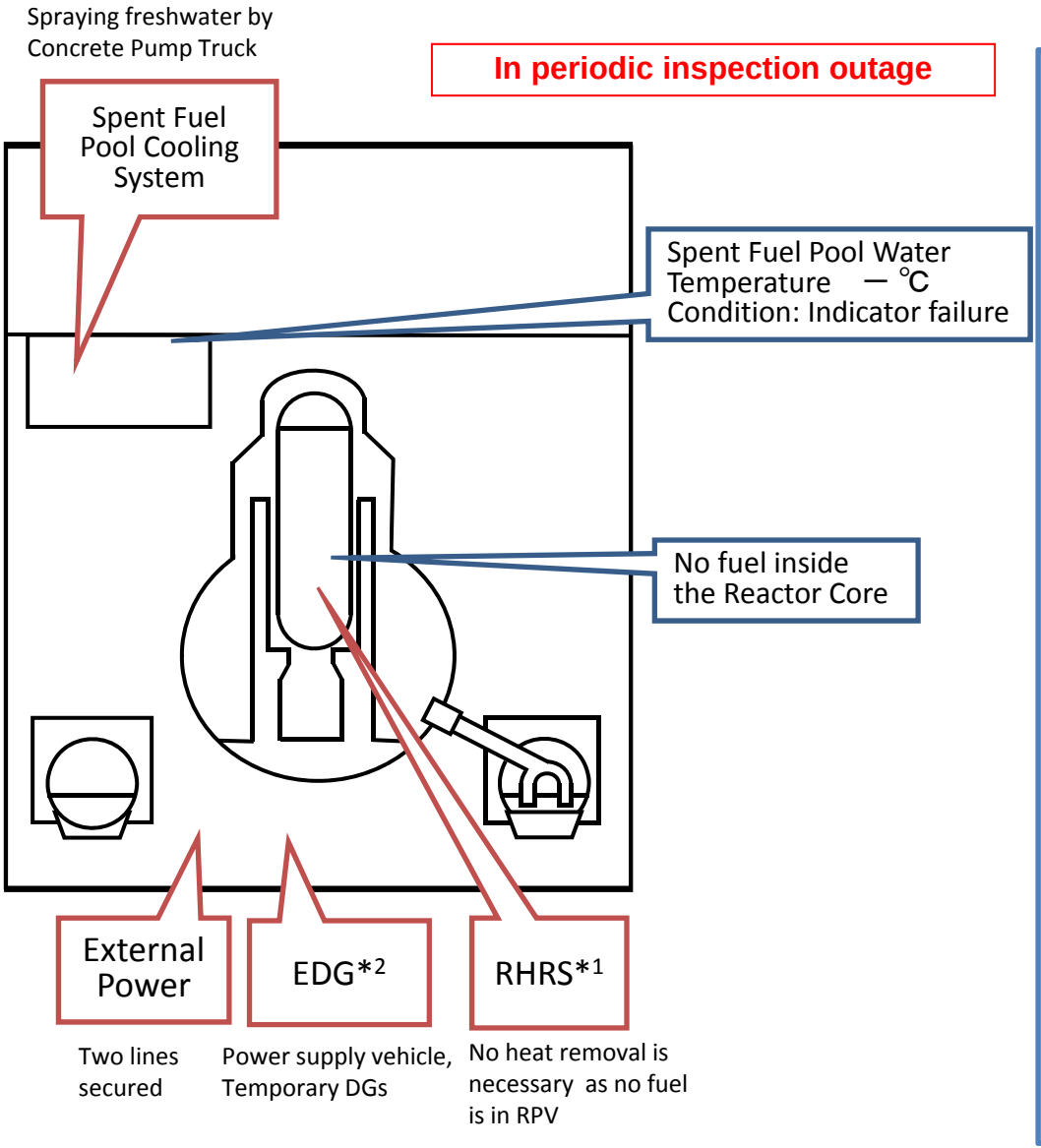
March 11th 14:46 Under operation, Automatic shutdown by the earthquake
March 11th 15:42 Report based on the Article 10 (Total loss of A/C power)
March 13th 05:10 Occurrence of the Article 15 event (Inability of water injection of the Emergency Core Cooling System)
March 13th 08:41 Started to vent.
March 13th 13:12 Started to inject seawater and borated water to the Reactor Core.
March 14th 05:20 Started to vent.
March 14th 07:44 Occurrence of the Article 15 event (Unusual rise of the pressure in PCV)
March 14th 11:01 Sound of explosion
March 16th around 08:30 White smoke generated.
March 17th 09:48～10:01 Water discharge by the helicopters of Self-Defense Force
March 17th 19:05～19:15 Water spray from the ground by High pressure water-cannon trucks of Police
March 17th 19:35～20:09 Water spray from the ground by fire engines of Self-Defense Force
March 18th before 14:00～14:38 Water spray from the ground by 6 fire engines of Self-Defense Force
March 18th ～14:45 Water spray from the ground by a fire engine of the US Military
March 19th 00:30 ～01:10 Water spray by Hyper Rescue Unit of Tokyo Fire Department
March 19th 14:10 ～ 20th 03:40 Water spray by Hyper Rescue Unit of Tokyo Fire Department
March 20th 11:00 Pressure of PCV rose(320kPa).Afterward fell.
March 20th 21:36 ～ 21st 03:58 Water spray by Hyper Rescue Unit of Tokyo Fire Department
March 21st around 15:55 Grayish smoke generated and was confirmed to be died down at 17:55.
March 22nd 15:10 ～16:00 Water spray by Hyper Rescue Unit of Tokyo Fire Department and Osaka City Fire Bureau.
March 22nd 22:46 Lighting in the Central Control Room was recovered.
March 23rd 11:03 ～13:20 Injection of about 35 ton of sea water to the Spent Fuel Pool (SFP) via the Fuel Pool Cooling Line (FPC)
March 23rd around 16:20 Black smoke generated and was confirmed to died down at around 23:30 and 24th 04:50.
March 24th 05:35～16:05 Injection of around 120 ton of sea water to SFP via FPC
March 25th 13:28～16:00 Water spray by Kawasaki City Fire Bureau supported by Tokyo Fire Department
March 25th 18:02 Started fresh water injection to the core.
March 27th 12:34～14:36 Water spray by Concrete Pump Truck
March 28th 17:40～31st around 8:40 Transferring the water from the Condensate Storage Tank (CST) to the Surge Tank of Suppression Pool Water (SPT)
March 28th 20:30 Switched to the water injection to the core using a temporary motor-driven pump.
April 3rd 12:18 The power supply to the temporary motor-driven pump was switched from the temporary power supply to the external power supply.
April 11th around 17:16 Loss of external power supply of Unit 1 and 2 due to an earthquake occurred (at Hamadori in Fukushima Prefecture) and water injection to the Reactor Core was suspended.
April 11th 18:04 External power supply of Units 1 and 2 recovered (April 11th 17:56). Resumed injecting water to the Reactor Core.
April 17th 11:30～14:00 Confirmed the situation in the reactor building using unmanned robot.
April 18th 12:38～13:05 Stopped the water injection into the reactor core to replace the current hose with a new one
April 19th 10:23 Completed the work of strengthening connection of the power supplies between Units 1-2 and Units 3-4.
April 22nd 13:40～14:00 Tentatively Injected freshwater to SFP via the Fuel Pool Coolant Purification Line.
April 25th 10:57～18:25 For reinforcement work of the power supply, the power supply to the pump injecting water into the reactor core was temporarily switched from the external power supply to the temporary diesel generator.

Major Events after the Earthquake 2/2

<Water spray by Concrete Pump Truck (Fresh water)>

March 29th 14:17～18:18, March 31st 16:30～19:33, April 2nd 09:52～12:54, April 4th 17:03～19:19, April 7th 06:53 ～ 08:53, April 8th 17:06～20:00, April 10th 17:15～19:15, April 12th 16:26～17:16, April 14th 15:56～16:32, April 18th 14:17 ～15:02, April 22nd 14:19～15:40, April 26th 12:25～14:02

Conditions of Fukushima Dai-ichi Nuclear Power Station Unit 4
（As of 6:00 April 27th, 2011）



*1 Residual Heat Removal System

*2 Emergency Diesel Generator

*3 Reactor Pressure Vessel

Major Events after the Earthquake

In periodic inspection outage when the earthquake occurred
March 14th 04:08 Water temperature in the Spent Fuel Pool (SFP), 84℃
March 15th 06:14 Confirmed the partial damage of wall in the 4th floor.
March 15th 09:38 Fire occurred in the 3rd floor. (12:25 extinguished)
March 16th 05:45 Fire occurred. TEPCO couldn't confirm any fire on the ground. (06:15)
March 20th 08:21～09:40 Water spray over SFP by Self-Defense Force
March 20th around 18:30～19:46 Water spray over SFP by Self-Defense Force
March 21st 06:37～08:41 Water spray over SFP by Self-Defense Force
March 21st around 15:00 Work for laying cable to Power Center was completed.
March 22nd 10:35 Power Center received electricity.

<Water spray by Concrete Pump Truck (Seawater)>
March 22nd 17:17～20:32, March 23rd 10:00～13:02, March 24th 14:36～17:30, March 25th 19:05～22:07, March 27th 16:55～19:25

March 25th 06:05～10:20 Sea water injection to SFP via the Fuel Pool Cooling Line (FPC)
March 29th 11:50 Lighting in the Central Control Room was recovered.
April 11th around 17:16 An earthquake occurred (at Hamadori in Fukushima Prefecture).
April 12th 12:00～13:04 Sampled the water in SFP.
April 19th 10:23 Completed the work of strengthening connection of the power supplies between Units 1-2 and Units 3-4.
April 22nd Measured the water level of SFP by a gauge hung on Concrete Pump Truck (62m class).

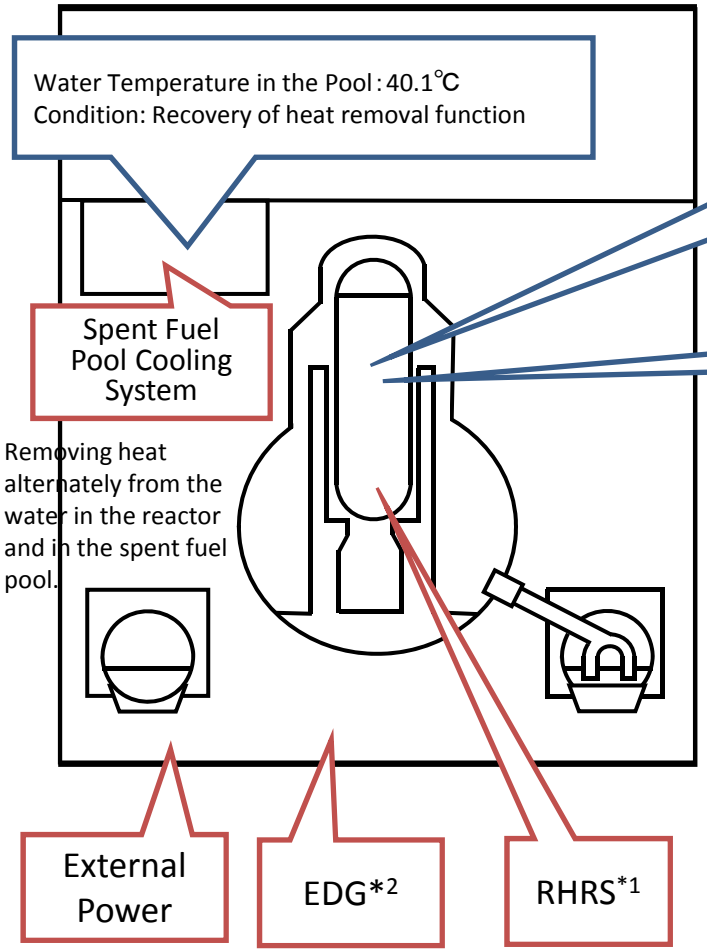
< Water spray by Concrete Pump Truck (Fresh water)>
March 30th 14:04～18:33, April 1st 08:28～14:14, April 3rd 17:14～22:16, April 5th 17:35～18:22, April 7th 18:23～19:40, April 9th 17:07～19:24, April 13th 0:30～6:57, April 15th 14:30～18:29, April 17th 17:39～21:22, April 19th 10:17～11:35, April 20th 17:08～20:31, April 21st 17:14～21:20, April 22nd 17:52～23:53, April 23rd 12:30～16:44, April 24th 12:25～17:07, April 25th 18:15～April 26th 0:26, April 26th 16:50～20:35

Current Conditions：No fuel is in RPV*3.
Fresh water is being injected to the Spent Fuel Pool.

(Editorial committee for Nuclear Energy Handbook, Nuclear Energy Handbook)

Conditions of Fukushima Dai-ichi Nuclear Power Station Unit 5
（As of 6:00 April 27th, 2011）

In periodic inspection outage



Reactor Pressure : 0.104MPa*
Reactor Water Level : 1,561mm
Reactor Water Temperature : 38.3℃
Condition : Pressure is under control.
*converted to absolute pressure

Reactor Pressure Vessel Temperature:
Monitoring by Reactor Water Temperature

One line secured

Share two EDGs of Unit 6

Removing heat alternately from the water in the reactor and in the spent fuel pool.

*1 Residual Heat Removal System

*2 Emergency Diesel Generator

Major Events after the Earthquake :

March 20th 14:30 Cold shutdown

March 21st 11:36 Receiving electricity from external power supply

March 23rd 17:24 Pump for Residual Heat Removal Seawater System (RHRS) was automatically stopped when the power supply was switched from the temporary to the permanent.

March 24th 16:14 Repair of the RHRS pump was completed.

March 24th 16:35 Started to cooling.

April 4th 21:00 – 8th 12:14 Discharged the groundwater with low-level radioactivity in the Sub Drain Pit to the sea (around 950 ton).

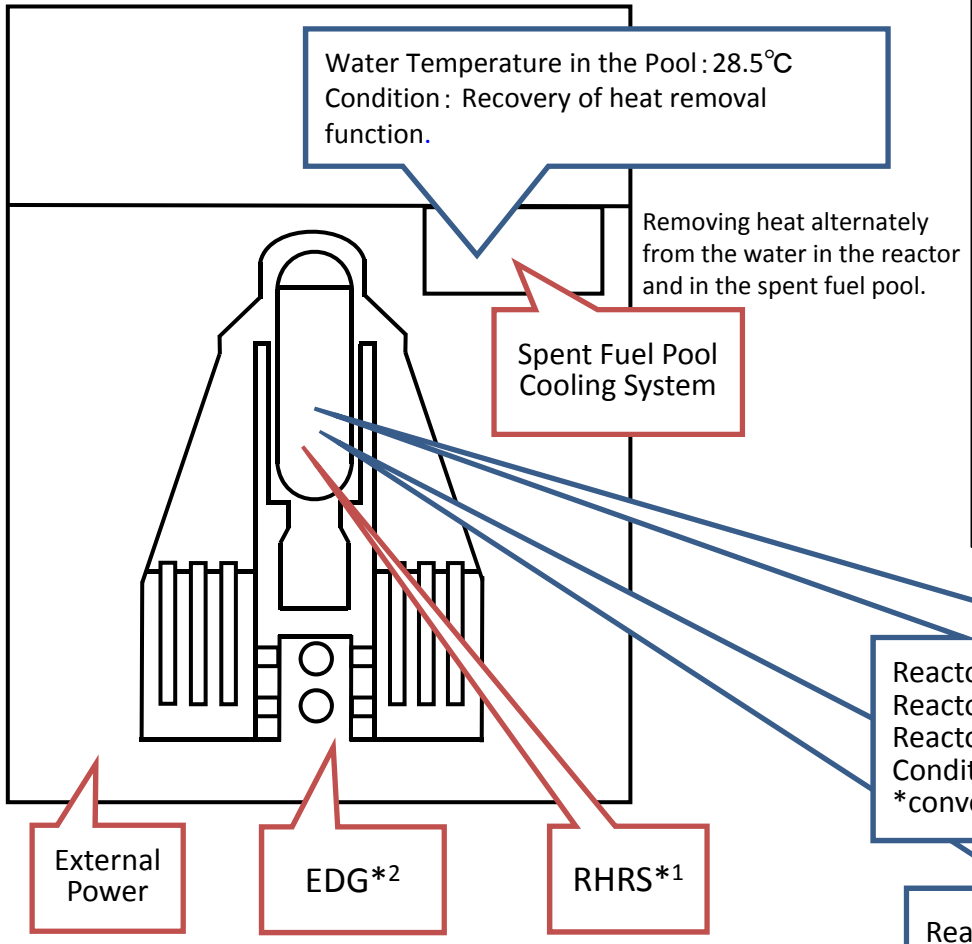
April 25th 12:22 ～16:43 For reinforcement work of the power supply, the pump for Residual Heat Removal (RHR) was temporarily stopped.

April 25th 14:44～17:38 Implemented reinforcement work of the power supply (connection of the power supplies between Units 1-2 and Units 5-6).

(Editorial committee for Nuclear Energy Handbook, Nuclear Energy Handbook)

Conditions of Fukushima Dai-ichi Nuclear Power Station Unit 6
（As of 6:00 April 27th, 2011）

In periodic inspection outage



Major Events after the Earthquake :

March 20th 19:27 Cold shutdown

March 22nd 19:17 Receiving electricity from external power supply

April 4th 21:00 – 9th 18:52 Discharged the groundwater with low-level radioactivity in the Sub Drain Pit to the sea (around 373 ton).

April 19th 11:00～15:00 Transferred stagnant water under the base of the turbine building to the condenser for measuring the amount of it.

April 20th 9:51～15:56 The pump for Residual Heat Removal (RHR) was temporarily stopped in order to change the position of the hose of the temporary RHR Seawater System.

April 25th 14:44～17:38 Implemented reinforcement work of the power supply (connection of the power supplies between Units 1-2 and Units 5-6).

*1 Residual Heat Removal System

*2 Emergency Diesel Generator

(Editorial committee for Nuclear Energy Handbook, Nuclear Energy Handbook)

News Release

Extract

経済産業省 Ministry of Economy, Trade and Industry

April 27, 2011
Nuclear and Industrial Safety Agency

Seismic Damage Information (the 116th Release)
(As of 08:00 April 27th, 2011)

Nuclear and Industrial Safety Agency (NISA) confirmed the current situation of Onagawa NPS, Tohoku Electric Power Co. Inc.; Fukushima Dai-ichi and Fukushima Dai-ni NPSs, Tokyo Electric Power Co. Inc. (TEPCO); Tokai Dai-ni NPS, Japan Atomic Power Co. Inc. as follows:

Major updates are as follows.

1. Nuclear Power Stations (NPSs)

● Fukushima Dai-ichi NPS

- Confirmation of the situation, etc. at the reactor building of Unit 1 using an unmanned robot was carried out. (From 11:35 till about 13:24 April 26th)
- Fresh water injection (around 47.5t) to the Spent Fuel Pool of Unit 3 using the Fuel Pool Coolant Clean-up System was carried out. (From 12:25 till 14:02 April 26th).
- Fresh water spray of around 130t over Unit 4 using Concrete Pump Truck (62m class) was carried out. (From 16:50 till 20:35 April 26th)
- Full-scale implementation of spraying anti-scattering agent was carried out in the area of about 5,000 m^2 on the ocean-side of Unit 3 using an unmanned crawler dump. (From 13:30 till 17:00 April 26th)
- Removal of rubble (amounts equivalent to 2 containers) using remote-control heavy machineries was carried out. (From 9:00 till 16:00 April 26th).

For more information:
NISA English Home Page
http://www.nisa.meti.go.jp/english/index.html

The Activities of Japan's Industry to Revive the Supply Chain

April 2011

Ministry of Economy, Trade and Industry

- Following the massive earthquake, many factories located in the Tohoku and Kanto regions stopped production. Since then, major companies that have relationships with global supply chains have already recovered and restarted their operations.
- On the other hand, some factories have suffered considerable damage. The Government of Japan should pay attention to the situation continuously.
- However, casting the eyes over the economy of Japan, a positive movement for the revival can be seen in several situations. (e.g. the supply increase of electricity for blast furnace companies, the increase in demand for household wiring.)

【The distribution of main factories in the Tohoku and the Kanto regions】

The Revival of the Supply Chain

（Electronics Ⅰ）

＜Outline of Electronics Industry＞

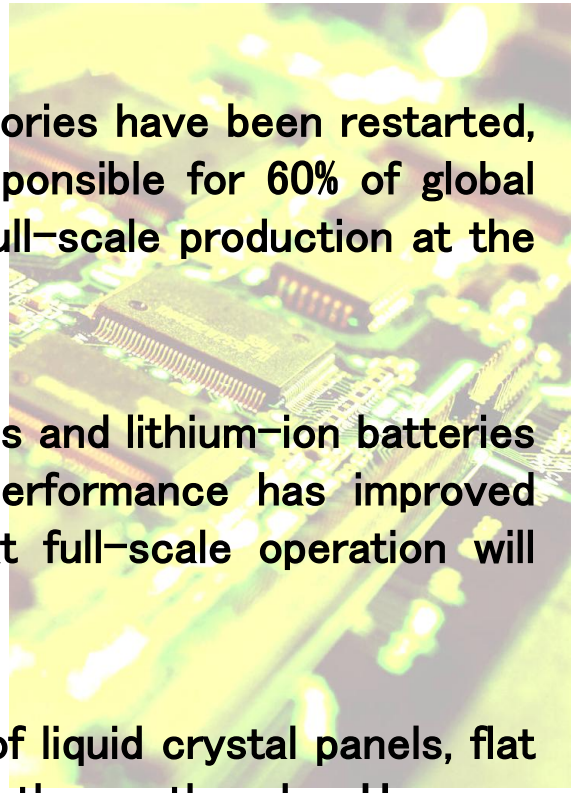
○ Because of the earthquake, a raw materials and product parts factories that have suffered damage are being brought back into operation one-by-one. There are no negative influences on the production of electronics, e. g. flat panel TVs, mobile phones, smart phones, and lithium-ion batteries, etc..

- A company that produces and exports silicon wafers for overseas had its factory damaged by the earthquake. At present, operations have been resuming and the company has 2-3 months of stocks both inside and outside Japan. In addition, its overseas factory was not affected and therefore, there is not a significant influence on its customers.

- A company that produces and exports silicon wafers for overseas had its factory damaged a little. The company has resumed production in Tohoku and has increased the production amount at its factory in other area. At present, its production has already surpassed its pre-earthquake level.

The Revival of the Supply Chain

（Electronics Ⅱ）



- In regard to the aluminum rolling industry, damaged factories have been restarted, and have resumed full-scale production. A factory responsible for 60% of global aluminum substrate production for HDDs regained its full-scale production at the end of March.

- The production of ultra-slim copper foil for flexible bases and lithium-ion batteries initially declined due to rolling blackouts. However, performance has improved gradually since the end of March. It is expected that full-scale operation will resume in early May.

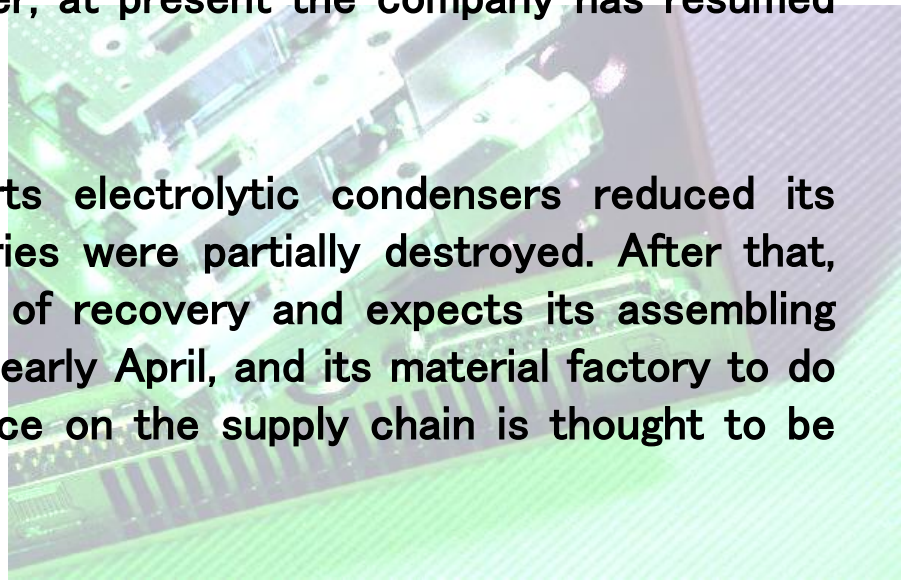
- The production of ITO targets used for manufacturing of liquid crystal panels, flat panel TVs etc., was suspended due to the effects by the earthquake. However operation has restarted. Therefore, because of this and because of the use of alternative inventory sources, a tremendous impact on the supply chain has not seen.

The Revival of the Supply Chain
（Electronics Ⅲ）

- A company that produces and exports small and medium-sized LCDs initially stopped its operation because its factories were partially damaged and production was suspended by rolling blackouts in March. However, at present the company has resumed operation, and therefore, there seems to be no further influence on cell phone, smart phone and tablet PC production and delivery.

- A company that produces and exports lithium-ion batteries initially stopped operation because its factories were partially damaged and production was suspended by rolling blackouts. However, at present the company has resumed its operations sequentially.

- A company that produces and exports electrolytic condensers reduced its production because its principal factories were partially destroyed. After that, the company proceeded with the task of recovery and expects its assembling factory to resume partial operations in early April, and its material factory to do so in early May. Therefore, the influence on the supply chain is thought to be limited.



The Revival of the Supply Chain

（Electronics Ⅳ）

- A company producing fluted plates used for semiconductor packages that are supplied to overseas suspended its operation due to trouble in securing raw materials caused by the rolling blackouts. Since then however, it resumed operations at a good level. At present, the company has announced that it is facing strained material supplies, and is also offering alternative sources for its customers accordingly.

- A company producing solder masks used for processors that are supplied to overseas suspended operations due to trouble securing raw materials from chemical companies. After negotiations, the company secured a stock of raw materials that will enable it to operate until mid-June, and has informed processor makers that it will ask its users to evaluate sample products using alternative materials in mid-April.

- A company producing liquid epoxy encapsulants used for semiconductors that are supplied overseas suspended its operation due to trouble in securing raw materials from chemical companies. At present, the company has secured a stock of raw materials until mid-May, and is also considering alternative supply schemes by means of sourcing from overseas. It is expected that both sides will be in contact and confirm the adjustment of supply.

The Revival of the Supply Chain

（Aircraft）

＜ Outline of Aircraft Industry ＞

○Just after the disaster, some factories temporarily decreased or suspended their productive activities. However, they've already resumed their operations and moreover expect to achieve overall level operation in May, and full-scale production in June.

- A company exporting aircraft engine shafts for the United States, France, and Britain has been adjusting delivery dates because of production lost through rolling blackouts. Now that the blackout issue had been solved, and the company can resume its production, there is no impact on its customer's operations.

- A company, whose factory was damaged by the earthquake disaster, manufactures and exports turbine blades and engine disks of aircraft engines to the United States and Europe. The affected factory has already had its power supply restored and had some of the manufacturing facilities repaired. The overall operation will resume in May, and the production rate is expected to get back to normal in June. Now, the company is considering a new production plan to make up for the production delay and increase output still more.

The Revival of the Supply Chain

（Automobiles Ⅰ）

＜ Outline of the Automobile Industry ＞

○Just after the disaster, the production of automobiles was reduced or suspended but there have been movement toward resumption of production for several models with companies adjusting their operational procedures.

- A company that produces and exports the elements of oil seals has restarted operation, though its factories were severely damaged by the earthquake.

- A company that produces and exports transmissions had a second supplier that had been damaged by the earthquake, but its operation has returned to its baseline performance.

The Revival of the Supply Chain
（Automobiles Ⅱ）

- A company exporting rolled steel used for autos for the United States and steel pipes for Germany has suffered no impact in terms of the production of its customers as resuming operation one by one, in addition to the customer's stock.

- A company which exports paint luster pigments to the United States and Europe was damaged by the earthquake and forced to stop production. Some companies stopped selling cars with certain colors because of a lack of alternatives, but there has been no effect on sales cars with other colors. It is expected to start supply after June.

- A company which exports ECUs, airflow sensors and power modules for inverters was late to supply parts to automobile manufacturers, but it resumed regular operation before the end of March.

The Revival of the Supply Chain

（Automobiles Ⅲ）

- A company that produces and exports permanent magnets used for driving motors of hybrid vehicles and electric vehicles for overseas suspended operations due to rolling blackouts. At present, all operations have resumed and the company has already secured a stable supply for its customers.

- A company that produces and exports MCU (semiconductors) for a wide range of products (such as cars, electromechanical products, and industrial machinery) was forced to stop operation because its factories were damaged by the earthquake. Maximum efforts for the earliest recovery have been made and as a result, it will move up the schedule for mass production at the 200-millimeter (mm) (8-inch) wafer fabrication line to June 15, this is at least one month earlier than the previous schedule.

Positive Aspects of Japan's Industry

- Each company with blast furnace put its priorities on the production of revival-oriented materials, e.g. light section steel for temporary shelters and large diameter steel for pipes. Moreover, in regard to power shortages and energy saving, these companies enhanced their supply of electricity for Tokyo Electric Power Company, while expanding their joint power generation, independent power production, and private power generation, etc.

- In regard to electric wires used for dwellings vital for economic revival, the production has been focused in western Japan. The factories in the area have enhanced their operation, and achieved 120% production in April, overtaking their pre-disaster performance.

- March manufacturing machinery orders exceeded 100 billion yen for the third month in a row and orders were 49.6% higher compared to the same period last year. This trend owes to the sort of demand found in a developing nation, especially China. From now, more external demand is expected.

【Appendix】

＜Electronics Ⅰ＞

Silicon wafers … Laminated materials made from sliced monocrystalline of high purity silicon, which are used for mobile phones, digital consumer electronics, and micro controllers in automobiles, etc.

＜Electronics Ⅱ＞

Flexible base … Wiring boards able to be transformed repeatedly by the application of a small amount of strength. These materials are thinner than ordinary printed substrates, and used for wiring in movable components.

Ultra-slim copper foil ･･･ Copper foil attached to copper-clad laminate; its thickness is adjusted according to respective user specs.

ITO target … Principal materials used for the production of transparent electrode of LCD TVs or solar batteries. These are easily processed and are highly transparent.

＜Electronics Ⅲ＞

Electrolytic condensers … Able to accumulate a large capacity of electricity using oxide films formed on the surface of an aluminum electrode.

＜Electronics Ⅳ＞

Copper-clad laminate for printed circuit boards… Principal boards that form the base for PCs or mobile phones, attaching copper foil to insulators made of resin and base materials.

Solder mask for semiconductor … Insulation film that covers the surface of printed circuit boards and protects circuit patterns.

＜Electronics Ⅳ＞

Liquid epoxy encapsulant for semiconductors … Protective materials to maintain stability for long periods of time, protecting semiconductor tips or joints from stress, e. g. temperature or moisture.

＜Aircraft＞

Engine shaft … Axis parts rotating at high-speed in jet engines

Turbine blade … Long and slender blades that catch air currents from the front and rotate the disk.

Engine disk … Disk attached to the rotation axis of engines. Turbine blades are attached to the edge of the disk.

＜Automobiles Ⅰ＞

Transmission ‥ Converting power from the engine into rotational speed and velocity according to the running condition of the automobile; transmissions have a major influence on fuel cost performance and riding comfort.

＜Automobiles Ⅱ＞

ECU… Devices that electrically control engine, transmissions and air bag operation.

Air flow sensor … Sensor measuring air content absorbed in the engine; has a major influence on fuel cost performance

Power-module for inverter ‥‥ Changes electric current from direct to alternating current.