7 Summary of Actual Manipulation Results

Results of manipulation such as implementing Isolation Condenser System, Reactor Core Isolation Cooling System, Primary Containment Venting System and Alternative Water Injection etc at the power station after the earthquake show at the chart 7.1(1)～(5). Manipulation results are summarized based on confirmed exchanged information between the Headquarter and the power station, and operator task journal etc. Hereafter, it is possible that as per detailed analyses of other parameters and clear attestation by persons involved, clarification of facts advances more and we may find information related to the movement of equipment, which is not confirmed at this report. In that case, we would like to announce that facts in each case.

①Manipulation results of Isolation Condenser System ②Manipulation results of Reactor Core Isolation Cooling System ③Manipulation results of High Pressure Core Injection System ④Manipulation results of Safety Relief Valve ⑤Manipulation results of Primary Containment Venting System are shown at the Chart ７．１（1）.

⑥Results of securing power and restoring power are shown as “” at the Chart “Status of Emergency Rehabilitation by power source car” ７．１（2） and “Status of Receiving power from the off site power” at the Chart ７．１（3）.

⑦Manipulation results of usage of fire pump and injection of alternative water injection as sweater injection are shown at the Chart separately as results of water injection for the reactor and the spent fuel pool at the Chart ７．１（4）.

⑧Treatment results of accumulated contaminated water at the turbine building, outdoors trenches and outdoors ducts are shown at the Chart ７．１（5）.

Chart 7. 1 (1)　Summary of Actual Manipulation ―― Results of Reactor Coolant System, Safety Relief Valve, Primary Containment Ventilating System

	1F1	1F2	1F3
① Manipulation results of Isolation Condenser System (IC)	・3/11 14:52　IC was automatically started ・3/11 18:10　IC(A)system 2A,3A Ventilating opened／confirmed steam ・3/11 18:25　IC(A)system3A Ventilating opened ・3/11 21:19　Implemented lineup by Diesel Drive Fire Pump (D/D-FP) ・3/11 21:30　IC 3A Ventilating opened ・3/11 21:35　Being supplied by D/D-FP ・3/12 01:48　Supply stoppage due to failure if the pump instead of out of fuel when confirming D/D-FP		
② Manipulation results of Reactor Core Isolation Cooling System (RCIC)		・3/11 15:02　RCIC started manually ・3/11 15:28　RCIC tripped(L-8) ・3/12 02:55　confirmed the status of RCIC (discharge pressure at the site) ・3/12 04:20～5:00　Switched the source of RCIC from Condensate Storage Tank to suppression chamber ・3/14 13:25　RCIC stopped (presumption)	・3/11 15:06　RCIC started manually ・3/11 15:25　RCIC tripped(L-8) ・3/11 16:03　RCIC started manually ・3/12 11:36　RCIC tripped
③ Manipulation results of High Pressure Core Injection System (HPCI)	No operation	No operation	・3/12 12:35　HPCI started (L-2) ・3/13 02:42　HPCI stopped
④ Results of opening and closing of Safety Relief Valve (SRV) (manipulation to decrease reactor pressure)	No operation	・3/14 16:34　Started manipulation to decrease the pressure of Reactor Pressure Vessel (SRV opened) ・3/14 approx. 18:00　Confirmed decrease in pressure of Reactor Pressure Vessel　Hereafter, due to the problem of maintaining excitation of electromagnetic valve of SRV drive air pressure and air pressure supply line, SRV closed and reactor pressure increased presumably. ・3/14 21:20　SRV 2 valve was opened and pressure in the Reactor decreased. Recovered water level.	・3/13 approx. 09:08　Started to opened SRV　Hereafter, due to the problem of maintaining excitation of electromagnetic valve of SRV drive air pressure and air pressure supply line, SRV closed and opened presumably

	1F1	1F2	1F3
		Hereafter, due to the problem of maintaining excitation of electromagnetic valve of SRV drive air pressure and air pressure supply line, SRV closed and opened presumably	
⑤ Results of opening and closing of Containment Ventilating System	■ 3/12 10:17 Operated AO valve located suppression chamber side at main control room ・Before the above operation 3/12 approx. 09:15 Manually MO valve ventilating opened at the site (25%) 3/12 approx. 09:30 Tried manually AO valve ventilating, but abandoned due to high dose ・Because it was difficult to maintain opening due to the problem of AO valve ventilating drive air pressure, opened operation was implemented multiple times presumably. ・3/12 approx. 14:00 Set the AO valve ventilating drive temporary air compressor, hereafter, at 14:30, confirmed the decrease in pressure of Containment Vessel.	■ 3/13 11:00 Finished suppression chamber ventilating composition (Hydrogen explosion at Unit 3 of the reactor building (3/14 11:01) , confirmed valve was closed and impossible to open) . ・So, ventilating was tried multiple times presumably. 3/14 approx. 21:00 Operated valvelet open at the suppression chamber side. (3/15 0:02 confirmed close of its valvelet) ■ 3/15 0:02 Operated valvelet open at the drywell side (confirmed close of its valvelet after few minutes) Against the 2 ventilating operation above, decrease in pressure of containment vessel was not confirmed and ventilating status is unclear. In order to smoothly precede the operation to reduce of pressure of reactor pressure vessel, following operations were conducted to reduce pressure and temperature of suppression chamber, which SRV exhaust comes in. ・3/14 approx. 16:00 Operate valve open at the suppression chamber side (Same day, approx. 16:20 confirmed close of its valve)	■ 3/13 8:41 Finished ventilating composition by AO valve operation at the suppression chamber. With regard to this operation, ・3/13 approx. 9:08 Reduce pressure of reactor pressure vessel by Safety Relief Valve (pressure of primary containment vessel increased) ・3/13 approx. 9:20 confirmed decrease in pressure of reactor containment vessel. ・3/13 11:17 Confirmed ventilating AO valve closed due to the outlet of drive air pressure. ・Hereafter, due to the problem of maintaining excitation of electromagnetic valve of AO drive air pressure and air pressure supply line, it was difficult to maintain opening, and multiple times of opening operation were implemented. - 3/13 12:30 opening operation／3/15 16:00 confirmed close - 3/15 16:05 opening operation／3/17 21:00 confirmed close - 3/17 approx. 21:30 opening operation／3/18 5:30 confirmed close - 3/18 approx. 5:30 opening operation／3/19 11:30 confirmed close - 3/20 approx. 11:25 opening operation／4/8 approx. 18:30 confirmed close ■ 3/14 5:20 Operated AP valve at the suppression chamber side and at 6:10, confirmed its valve opened. Next day, at 16:00, confirmed the status as closed. Hereafter, due to the problem of maintaining excitation of electromagnetic valve of AO drive air supply line, it was difficult to maintain AO valve opened, and opening operation were implemented presumably. - 3/16 1:55 opening operation／4/8 approx. 18:30 confirmed close

Chart 7. 1 (2)　Summary of Actual Manipulation ―― Securing the power source and results of rehabilitation (status of emergency rehabilitation by power source cars)

	1F1	1F2	1F3	1F4	1F5	1F6	Common Spent Fuel Pool Centralized RW
・3/11 approx. 17:00	Requested power source cars to the Distribution Department from Nuclear Power Department at Headquarter meeting						
・3/11 approx. 17:00	Distribution Department instructed to secure power source cars to all branches of the company						
・3/11 approx. 18:20	Requested to Tohoku Electric Power Company to dispatch high voltage power source car (We received information that our power source cars of each branch cannot go to Fukushima due to damage of roads and traffic congestion)						
・3/11 midnight	Prepared receiving power source cares ・ Deliberate the location of power source cars ・ Deliberate the cable line route (power source cars and load (P/C 2C (alternative water injection)) connection) ・ Arrange workers who lines cable and explained the operation ・ Procure cables (they were stored at the site for the outage work (prepared to procure cables from other place (Ibaraki prefecture), but we could procure required cables for a time)						
・3/11 approx. 23:00	First power source car (Tohoku Electric Power Company) arrived at Fukushima Daiichi Nuclear Power Station						
・3/12 before dawn	Lined cables and connection operation ・ Operation involved difficulties due to poor working condition (darkness, water puddle due to Tsunami, obstacles, missing hatches of manhole etc) ・ During operation, evacuation to the upland due to Tsunami warning						
・3/12 as of 3:00	11 power source cars at the site						
・3/12 approx. 7:00	3 power source cars of self-defense force arrived at the site						
・3/12 approx. 15:00	Completed the cable connection to the load (power center 2C) and preparing receiving power						
・3/12 15:36	Explosion occurred at the reactor building of Unit 1. Lined cables were damaged due to the rubbles caused by the explosion. High voltage power source cars were automatically stopped.						
・After the explosion of Unit 1～just before the explosion of Unit 3	Prepared cables and conducted re-lining cables						
・3/14 11:01			Explosion occurred at the reactor building of Unit 3. Power source cars were damaged due to the rubbles caused by the explosion.				

表７．１（３）　Summary of Actual Manipulation ―― Results of Securing Offsite Power and Restoration (Restoration Status of Power from Offsite Line)

１Ｆ１	１Ｆ２	１Ｆ３	１Ｆ４	１Ｆ５	１Ｆ６	Common Spent Fuel Pool Centralized RW
■ 480V P/C2C received power source(3/20 15:46) ・Temporary power source was supplied by Tohoku Nuclear Line ■ MUW system mega ring was implemented (3/21 0Ω) ■Received power to the panel for main line for measuring main bus conductor AC120V (3/23 1:40) ■ Main control's room lights restored (3/24 11:30) ■ Monitoring post restored(MP-5～8) ■ Completed laying tie line of line 1,2－line 3,4 (Mutually capable both Tohoku Nuclear Line－Okuma Line)(4/19 10:23) ■Set tie line with line 5/6 system line (4/25) ■3/29 at 8:32, switched a measure from fire pump to temporary motor driven pump regarding reactor water injection. 4/3 11:50 switched a measure from temporary motor driven pump to main facility regarding reactor water injection. 4/11 at 17:16, Unit 1～3's reactor water injection pump stopped due to the stoppage of the offsite power of Unit 1 and 2 (Tohoku Nuclear	■ 480V P/C2C received power source(3/20 15:46) ・Temporary power source was supplied by Tohoku Nuclear Line ■T/B MCC 2A-1受電 (3/26 16:40) ■ Main control's room lights restored (3/26 16:46) ■ Completed laying tie line of line 1,2－line 3,4 (Mutually capable both Tohoku Nuclear Line－Okuma Line)(4/19 10:23) ■Set tie line with line 5/6 system line (4/25) ■3/27 at 18:31, switched a measure from fire pump to temporary motor driven pump regarding reactor water injection 3/29 at 16:30, switched a measure from fire pump to temporary motor driven pump regarding SFP 4/3 at 11:50, switched a measure from temporary motor driven pump to main facility regarding reactor water injection 4/11 at 17:16, Unit 1～3's reactor water injection pump stopped due to the stoppage of the offsite power of Unit 1 and 2 (Tohoku Nuclear Line) caused by the earthquake 4/11 at 17:56, offsite	■P/C(4D) received power source(3/22 10:36) ・Temporary power source was supplied from 1L of Yonomori Line through Okuma Line ・ 3/18 at 14:28, completed test charge of line 3／4 to M／C car ・3/19 Completed setting Multi-circuit switch・cable ・ 3/20 Conducted investigation on cable from circuit breaker to load ・3/21 Completed cabling ・ Power source was stopped in relation to the reinforcement measure for offsite power of Unit 3,4(66KV boosting) (4/26 10:23～15:27) ■T/B MCC 3C-2 received power source (3/22 22:10) ■T/B MCC 3C-1 received power source (3/22 22:21) ■Received power to the panel for main line for measuring main bus conductor AC120V (3/22 22:28) ■ Main control's room lights restored (3/22 22:46) ■T/B MCC 3D-1 received power source (3/29) ■T/B MCC 3A-1 received power source (3/30)	■ P/C4D received power source(3/22 10:35) ・ Power source was stopped in relation to the reinforcement measure for offsite power of Unit 3,4(66KV boosting) (4/26 10:23～15:27) ■Received power to the panel for main line for measuring main bus conductor AC120V (3/22 21:52) ■ Main control's room lights of Unit 4 restored (3/29 11:50) ■ Completed laying tie line of line 1,2－line 3,4(Mutually capable both Tohoku Nuclear Line－Okuma Line) (4/19 10:23) (Current Status (as of 4/26) of power indicated in "Fukushima 1～4 Line Temporary Power Single Wire Circuit Diagram")	■Supplied power through acting Yonomori line(１L、２L) ■Received power from 5SA starting transformer to M/C(6C) (3/21 11:36), received power from M/C6C to P/C(5A-1)(3/22 20:13) ・Supplied power through acting Yonomori line(１L、２L) ■Regular system ５A, ５B are unusable ■Temporary pump (RHRS) was set and operated (power source P/C) ■ Main Anti-Earthquake Building received power (3/24 8:48) ■ Water Treatment Facility received power (3/24 9:10) ■Monitoring post(MP-1～4)Temporary cable was set and connected(3/26) ■ T/BMCC5D-2 received power (3/31) ■Set tie line with line 5/6 system line (4/25) ■ 3/19 at 5:00, RHR(C) started up ■ 3/23 at 17:24, after switching temporary pump's power from temporary RHRS pump to main power, tripped when trial run was conducted ■ 3/24 at 16:14, temporary RHRS pump was restarted , RHR pump was operated in	■Supplied power through acting Yonomori line(１L、２L) ■Received power from 5SA starting transformer to M/C(6C) (3/21 11:36), received power from 5SA starting transformer to M/C(6D) (3/22 19:17) ・Supplied power through acting Yonomori line(１L、２L) ■Regular system ６A, ６B are unusable ■ Temporary pump (alternative of RHRS) was set and operated (power source P/C) ■ Cable testing was conducted(3/20) ■Monitoring post(MP-1～4) ■Set tie line with line 5/6 system line (4/25) ■ 3/19 at 4:22, D/G(A) started up ■ 3/19 at 5:11, FPC started up ■ 3/19 at 21:26, Temporary RHRS pump started up ■ 3/19 at 22:14, RHR(B) started up ■ 3/25 at 15:38 and 15:42, 2 of temporary RHRS pumps' power were switched from temporary power to main power (Current Status (as of 4/26) of power indicated in	■ Restored power for common spent fuel pool (3/24 15:37) 3/24 at 18:05, fuel pool coolant pump started up ・ Temporary power for common spent fuel pool tripped (4/17 14:36～17:30 coolant function restored at 17:44. It may be caused by the electrical short circuit when conducting mock for the operation tomorrow at 1 L925 of Takaido switch (Actual electrical short circuit was L921 of Minikura) (Current Status (as of 4/26) of power indicated in "Fukushima 1～4 Line Temporary Power Single Wire Circuit Diagram")

1F1	1F2	1F3	1F4	1F5	1F6	Common Spent Fuel Pool Centralized RW
Line) caused by the earthquake 4/11 at 17:56, offsite power of Unit 1 and 2 (Tohoku Nuclear Line) restored 4/11 at 18:04, restarted the reactor water injection pump of Unit 1～3 (Current Status (as of 4/26) of power indicated in "Fukushima 1～4 Line Temporary Power Single Wire Circuit Diagram")	power of Unit 1 and 2 (Tohoku Nuclear Line) restored 4/11 at 18:04, restarted the reactor water injection pump of Unit 1～3 (Current Status (as of 4/26) of power indicated in "Fukushima 1～4 Line Temporary Power Single Wire Circuit Diagram")	■Completed laying tie line of line 1,2－line 3,4 (Mutually capable both Tohoku Nuclear Line－Okuma Line)(4/19 10:23) ■3/28 at 8:30, switched a measure from fire pump to temporary motor driven pump regarding SFP 4/3 at 11:50, switched a measure from temporary motor driven pump to main facility regarding reactor water injection 4/11 at 17:16, offsite power of Unit 1 and 2 (Tohoku Nuclear Line) restored 4/11 18:04 restarted the reactor water injection pump of Unit 1～3 4/11 at 17:56, offsite power of Unit 1 and 2 (Tohoku Nuclear Line) restored 4/11 at 18:04, restarted the reactor water injection pump of Unit 1～3 (Current Status (as of 4/26) of power indicated in "Fukushima 1～4 Line Temporary Power Single Wire Circuit Diagram")		SHC mode (Current Status (as of 4/26) of power indicated in "Fukushima 1～4 Line Temporary Power Single Wire Circuit Diagram")	"Fukushima 1～4 Line Temporary Power Single Wire Circuit Diagram")	

Chart 7. 1 (4) Summary of Actual Manipulation —— Manipulation results of Fire pump usage and alternative water injection such as sweater injection etc.

	1F1	1F2	1F3	1F4
Results of water injection to the reactor	・3/12 from 05:46, started fresh water injection by the fire pump and continued 80t of injection until at 14:53 on the same day. ・3/12 from 19:04, started sea water injection and stopped at 19:25. ・3/12 from 20:20 started sea water injection and including boric acid. Please refer to Reference-1, including above manipulation results	・3/14 at 16:34, started sea water injection by fire protection system line ・3/14 at 19:20, fire pump was stopped due to the out of fuel, but each at 19:54 and 19:57, started-up each fire pump and started seawater injection ・Approx. 21:20, confirmed recovery trend of the reactor water level Please refer to Reference－1 including above manipulation results	・3/13 at 09:25, started fresh water injection with boric acid ・3/13 at 13:12, switched from fresh water injection to sea water injection. 3/14 1:10～3:20, stopped injection, for refilling water to the water source pit. Please refer to Reference－1 including above manipulation results	
Results of water injection to the spent fuel pool	・Implemented water injection by the concrete pumping vehicle Please refer to Reference－2 as results of operation	・Implemented water injection accordingly with FPC(Fuel Pool Cooling and Filtering System) by using temporary driven motor Please refer to Reference－2 as results of operation	・In the early stage, water injection was implemented by helicopter, high-pressure water truck, bending spray tower vehicle. Then, periodic water injection was implemented by the concrete pump vehicle Please refer to Reference－2 as results of operation	・In the early stage, water injection was implemented by high-pressure water truck. Then, periodic water injection was implemented by the concrete pump vehicle. Please refer to Reference－2 as results of operation

Chart 7．1（5）　Summary of Actual Manipulation ―― Results of water treatment at turbine building, outside trench・duct accumulated water

1F1	1F2	1F3	1F4	1F5	1F6	Common Fuel Spent Pool Centralized RW
・Underground of T/B→H/W（3/24 17:10～3/29 17:30） ・Transferring from CST→SPT（3/31 12:00～3/31 14:24，3/31 15:25～～4/2 15:26） ・Transferring from H/W→CST(4/3 13:55 started～4/10 9:30 finished) Trench discharging operation ・Trench→Centralized R/W pellet storage（3/31 9:20～11:25）	・Transferring CST→SPT（3/29 16:45～3/31 14:24，3/31 15:25～4/1 11:50） ・Transferring H/W→CST（4/2 17:10～4/9 13:10） Trench discharge operation ・Confirmed stoppage of water inflow（4/6 approx. 5:38） ・Implemented covering with rubber plate and jack base to the part, which water leaked of the pit.(4/6 approx. 13:15) Poured liquid chemicals as a countermeasure for water stop.(4/7～4/10) ・Transferring from Vertical shaft→H/W 4/12 19:35～4/13 11:00 4/13 15:02～17:04 finished ・Transferring from vertical shaft→centralized R/W 4/19 10:08～being implemented	・Transferring CST→SPT surge tank(A) 3/28 17:40～3/31 8:37	・Transferring from centralized RW→T/B（4/2 14:25 started） ・Increased number of transferring pump from 1 to 5. Transferring pump is used from Centralized RW to T/B（4/3 10:00～4/4 9:22）Stopped transferring due to the increase of water level at the vertical shaft of 1F3	・Discharging contaminated water from sub-drain to the sea. Amount of discharge：950m3 (4/5 started at 17:25～4/8 finished at 12:14) ・RHR pump room、draw accumulated contaminated water at CS pump room to torus room(3/28～continuing) ・R/B discharge operation Transferring from CS room→torus room (3/28～continuing)	・Underground of R/W→discharge to H/W（4/1 13:40～4/2 10:00） ・Discharging contaminated water from sub-drain pit to the sea. Amount of discharge：372.6m3 (4/4 started at 21:00～4/9 finished at 18:52) ・T/B→H/W 移送 (4/19)	・Discharging accumulated contaminated water at centralized RW（4/4 started at 19:03～4/10 finished at 17:40）. Amount of discharge：9070m3 ・Countermeasure for water stop at process building. Preventing underground water inflow to the building. 4/16～4/18 Completed concrete installation ・Transferring high doze water of Unit 2 to centralized RW. (4/19 10:08～)

Amount of Water Injection to the Reactor of Fukushima Nuclear Power Station Unit 1～3 ＜Estimation＞ (Commencement of sea water injection*)～as of 8:00 am, May 15th, 2011)

*)On March 12th, 80kL of fresh water injection to Unit 1 was condcuted before sea water injection. Some amount of fresh water injection to Unit 3 until was conducted until it was switched to sea water from March 12th to 13th. However, amount of fresh w

(Note) Since above amount of water injection includes number, which was calculated by temporary inflow meter and excludes temporary change of water inflow actual amount of water injection to the reactor may slightly differ.

Date	Unit 1 of Fukushima Daiichi Nuclear Power Station			Unit 2 of Fukushima Daiichi Nuclear Power Station			Unit 3 of Fukushima Daiichi Nuclear Power Station		
	Amount of water (per day)	Cumulative (sea water)	Cumulative (fresh water)	Amount of water (per day)	Cumulative (sea water)	Cumulative (fresh water)	Amount of water (per day)	Cumulative (sea water)	Cumulative (fresh water)
March 12, 2011	approx. 21 kL (sea water)	approx. 21 kL							
March 13, 2011	approx. 185 kL (sea water)	approx. 206 kL					approx. 390 kL (sea water)	approx. 390 kL	
March 14, 2011	approx. 23 kL (sea water)	approx. 230 kL		approx. 415 kL (sea water)	approx. 415 kL		approx. 319 kL (sea water)	approx. 709 kL	
March 15, 2011	approx. 259 kL (sea water)	approx. 489 kL		approx. 1,872 kL (sea water)	approx. 2,287 kL		approx. 774 kL (sea water)	approx. 1,483 kL	
March 16, 2011	approx. 259 kL (sea water)	approx. 748 kL		approx. 1,872 kL (sea water)	approx. 4,159 kL		approx. 864 kL (sea water)	approx. 2,347 kL	
March 17, 2011	approx. 294 kL (sea water)	approx. 1,042 kL		approx. 1,157 kL (sea water)	approx. 5,317 kL		approx. 490 kL (sea water)	approx. 2,836 kL	
March 18, 2011	approx. 475 kL (sea water)	approx. 1,517 kL		approx. 802 kL (sea water)	approx. 6,119 kL		approx. 360 kL (sea water)	approx. 3,196 kL	
March 19, 2011	approx. 449 kL (sea water)	approx. 1,966 kL		approx. 711 kL (sea water)	approx. 6,830 kL		approx. 494 kL (sea water)	approx. 3,691 kL	
March 20, 2011	approx. 48 kL (sea water)	approx. 2,014 kL		approx. 480 kL (sea water)	approx. 7,310 kL		approx. 393 kL (sea water)	approx. 4,083 kL	
March 21, 2011	approx. 37 kL (sea water)	approx. 2,051 kL		approx. 384 kL (sea water)	approx. 7,694 kL		approx. 24 kL (sea water)	approx. 4,107 kL	
March 22, 2011	approx. 42 kL (sea water)	approx. 2,093 kL		approx. 261 kL (sea water)	approx. 7,955 kL		approx. 24 kL (sea water)	approx. 4,131 kL	
March 23, 2011	approx. 314 kL (sea water)	approx. 2,407 kL		approx. 279 kL (sea water)	approx. 8,234 kL		approx. 24 kL (sea water)	approx. 4,155 kL	
March 24, 2011	approx. 226 kL (sea water)	approx. 2,633 kL		approx. 278 kL (sea water)	approx. 8,512 kL		approx. 69 kL (sea water)	approx. 4,225 kL	
March 25, 2011	approx. 106 kL (sea water)	approx. 2,739 kL		approx. 478 kL (sea water)	approx. 8,990 kL		approx. 270 kL (sea water)	approx. 4,495 kL	
	approx. 60 kL (fresh water)		approx. 60 kL				approx. 88 kL (fresh water)		approx. 88 kL
March 26, 2011	approx. 173 kL (fresh water)		approx. 233 kL	approx. 207 kL (sea water)	approx. 9,197 kL		approx. 336 kL (fresh water)		approx. 424 kL
				approx. 245 kL (fresh water)		approx. 245 kL			approx. 424 kL
March 27, 2011	approx. 169 kL (fresh water)		approx. 402 kL	approx. 382 kL (fresh water)		approx. 627 kL	approx. 311 kL (fresh water)		approx. 735 kL
March 28, 2011	approx. 169 kL (fresh water)		approx. 571 kL	approx. 169 kL (fresh water)		approx. 797 kL	approx. 295 kL (fresh water)		approx. 1,030 kL
March 29, 2011	approx. 196 kL (fresh water)		approx. 767 kL	approx. 168 kL (fresh water)		approx. 965 kL	approx. 241 kL (fresh water)		approx. 1,271 kL
March 30, 2011	approx. 192 kL (fresh water)		approx. 958 kL	approx. 192 kL (fresh water)		approx. 1,157 kL	approx. 167 kL (fresh water)		approx. 1,438 kL
March 31, 2011	approx. 192 kL (fresh water)		approx. 1,150 kL	approx. 216 kL (fresh water)		approx. 1,373 kL	approx. 167 kL (fresh water)		approx. 1,605 kL
April 1, 2011	approx. 184 kL (fresh water)		approx. 1,334 kL	approx. 216 kL (fresh water)		approx. 1,589 kL	approx. 167 kL (fresh water)		approx. 1,772 kL
April 2, 2011	approx. 165 kL (fresh water)		approx. 1,499 kL	approx. 213 kL (fresh water)		approx. 1,802 kL	approx. 167 kL (fresh water)		approx. 1,939 kL
April 3, 2011	approx. 147 kL (fresh water)		approx. 1,646 kL	approx. 192 kL (fresh water)		approx. 1,994 kL	approx. 173 kL (fresh water)		approx. 2,112 kL
April 4, 2011	approx. 144 kL (fresh water)		approx. 1,790 kL	approx. 192 kL (fresh water)		approx. 2,185 kL	approx. 168 kL (fresh water)		approx. 2,280 kL
April 5, 2011	approx. 144 kL (fresh water)		approx. 1,934 kL	approx. 192 kL (fresh water)		approx. 2,377 kL	approx. 168 kL (fresh water)		approx. 2,448 kL
April 6, 2011	approx. 144 kL (fresh water)		approx. 2,078 kL	approx. 192 kL (fresh water)		approx. 2,568 kL	approx. 168 kL (fresh water)		approx. 2,616 kL
April 7, 2011	approx. 144 kL (fresh water)		approx. 2,222 kL	approx. 187 kL (fresh water)		approx. 2,755 kL	approx. 168 kL (fresh water)		approx. 2,784 kL
April 8, 2011	approx. 144 kL (fresh water)		approx. 2,366 kL	approx. 168 kL (fresh water)		approx. 2,923 kL	approx. 168 kL (fresh water)		approx. 2,952 kL
April 9, 2011	approx. 144 kL (fresh water)		approx. 2,510 kL	approx. 168 kL (fresh water)		approx. 3,091 kL	approx. 168 kL (fresh water)		approx. 3,120 kL
April 10, 2011	approx. 144 kL (fresh water)		approx. 2,654 kL	approx. 168 kL (fresh water)		approx. 3,259 kL	approx. 168 kL (fresh water)		approx. 3,288 kL
April 11, 2011	approx. 139 kL (fresh water)		approx. 2,793 kL	approx. 163 kL (fresh water)		approx. 3,421 kL	approx. 163 kL (fresh water)		approx. 3,450 kL
April 12, 2011	approx. 144 kL (fresh water)		approx. 2,937 kL	approx. 168 kL (fresh water)		approx. 3,589 kL	approx. 168 kL (fresh water)		approx. 3,618 kL
April 13, 2011	approx. 144 kL (fresh water)		approx. 3,081 kL	approx. 168 kL (fresh water)		approx. 3,757 kL	approx. 168 kL (fresh water)		approx. 3,786 kL
April 14, 2011	approx. 144 kL (fresh water)		approx. 3,225 kL	approx. 168 kL (fresh water)		approx. 3,925 kL	approx. 168 kL (fresh water)		approx. 3,954 kL
April 15, 2011	approx. 144 kL (fresh water)		approx. 3,369 kL	approx. 166 kL (fresh water)		approx. 4,092 kL	approx. 168 kL (fresh water)		approx. 4,122 kL
April 16, 2011	approx. 144 kL (fresh water)		approx. 3,513 kL	approx. 168 kL (fresh water)		approx. 4,260 kL	approx. 168 kL (fresh water)		approx. 4,290 kL
April 17, 2011	approx. 144 kL (fresh water)		approx. 3,657 kL	approx. 168 kL (fresh water)		approx. 4,428 kL	approx. 168 kL (fresh water)		approx. 4,458 kL
April 18, 2011	approx. 144 kL (fresh water)		approx. 3,801 kL	approx. 168 kL (fresh water)		approx. 4,595 kL	approx. 168 kL (fresh water)		approx. 4,626 kL
April 19, 2011	approx. 144 kL (fresh water)		approx. 3,945 kL	approx. 168 kL (fresh water)		approx. 4,763 kL	approx. 168 kL (fresh water)		approx. 4,794 kL
April 20, 2011	approx. 134 kL (fresh water)		approx. 4,079 kL	approx. 168 kL (fresh water)		approx. 4,931 kL	approx. 144 kL (fresh water)		approx. 4,938 kL
April 21, 2011	approx. 139 kL (fresh water)		approx. 4,219 kL	approx. 169 kL (fresh water)		approx. 5,100 kL	approx. 154 kL (fresh water)		approx. 5,092 kL

Date	Unit 1 of Fukushima Daiichi Nuclear Power Station			Unit 2 of Fukushima Daiichi Nuclear Power Station			Unit 3 of Fukushima Daiichi Nuclear Power Station		
	Amount of water (per day)	Cumulative (sea water)	Cumulative (fresh water)	Amount of water (per day)	Cumulative (sea water)	Cumulative (fresh water)	Amount of water (per day)	Cumulative (sea water)	Cumulative (fresh water)
April 22, 2011	approx. 144 kL (fresh water)		approx. 4,363 kL	approx. 168 kL (fresh water)		approx. 5,268 kL	approx. 161 kL (fresh water)		approx. 5,254 kL
April 23, 2011	approx. 143 kL (fresh water)		approx. 4,505 kL	approx. 166 kL (fresh water)		approx. 5,434 kL	approx. 160 kL (fresh water)		approx. 5,413 kL
April 24, 2011	approx. 143 kL (fresh water)		approx. 4,649 kL	approx. 167 kL (fresh water)		approx. 5,602 kL	approx. 163 kL (fresh water)		approx. 5,576 kL
April 25, 2011	approx. 143 kL (fresh water)		approx. 4,792 kL	approx. 168 kL (fresh water)		approx. 5,770 kL	approx. 164 kL (fresh water)		approx. 5,741 kL
April 26, 2011	approx. 145 kL (fresh water)		approx. 4,937 kL	approx. 167 kL (fresh water)		approx. 5,936 kL	approx. 161 kL (fresh water)		approx. 5,902 kL
April 27, 2011	approx. 200 kL (fresh water)		approx. 5,136 kL	approx. 167 kL (fresh water)		approx. 6,103 kL	approx. 161 kL (fresh water)		approx. 6,063 kL
April 28, 2011	approx. 240 kL (fresh water)		approx. 5,376 kL	approx. 168 kL (fresh water)		approx. 6,271 kL	approx. 163 kL (fresh water)		approx. 6,226 kL
April 29, 2011	approx. 185 kL (fresh water)		approx. 5,562 kL	approx. 167 kL (fresh water)		approx. 6,438 kL	approx. 159 kL (fresh water)		approx. 6,386 kL
April 30, 2011	approx. 144 kL (fresh water)		approx. 5,706 kL	approx. 166 kL (fresh water)		approx. 6,604 kL	approx. 156 kL (fresh water)		approx. 6,542 kL
May 1, 2011	approx. 144 kL (fresh water)		approx. 5,850 kL	approx. 166 kL (fresh water)		approx. 6,770 kL	approx. 157 kL (fresh water)		approx. 6,699 kL
May 2, 2011	approx. 143 kL (fresh water)		approx. 5,993 kL	approx. 167 kL (fresh water)		approx. 6,937 kL	approx. 162 kL (fresh water)		approx. 6,862 kL
May 3, 2011	approx. 143 kL (fresh water)		approx. 6,136 kL	approx. 168 kL (fresh water)		approx. 7,105 kL	approx. 165 kL (fresh water)		approx. 7,027 kL
May 4, 2011	approx. 144 kL (fresh water)		approx. 6,280 kL	approx. 167 kL (fresh water)		approx. 7,272 kL	approx. 195 kL (fresh water)		approx. 7,222 kL
May 5, 2011	approx. 144 kL (fresh water)		approx. 6,424 kL	approx. 168 kL (fresh water)		approx. 7,440 kL	approx. 216 kL (fresh water)		approx. 7,438 kL
May 6, 2011	approx. 172 kL (fresh water)		approx. 6,596 kL	approx. 168 kL (fresh water)		approx. 7,608 kL	approx. 216 kL (fresh water)		approx. 7,654 kL
May 7, 2011	approx. 192 kL (fresh water)		approx. 6,788 kL	approx. 168 kL (fresh water)		approx. 7,776 kL	approx. 216 kL (fresh water)		approx. 7,870 kL
May 8, 2011	approx. 192 kL (fresh water)		approx. 6,980 kL	approx. 168 kL (fresh water)		approx. 7,944 kL	approx. 216 kL (fresh water)		approx. 8,086 kL
May 9, 2011	approx. 192 kL (fresh water)		approx. 7,172 kL	approx. 168 kL (fresh water)		approx. 8,112 kL	approx. 216 kL (fresh water)		approx. 8,302 kL
May 10, 2011	approx. 192 kL (fresh water)		approx. 7,364 kL	approx. 167 kL (fresh water)		approx. 8,279 kL	approx. 216 kL (fresh water)		approx. 8,518 kL
May 11, 2011	approx. 191 kL (fresh water)		approx. 7,556 kL	approx. 168 kL (fresh water)		approx. 8,447 kL	approx. 216 kL (fresh water)		approx. 8,734 kL
May 12, 2011	approx. 190 kL (fresh water)		approx. 7,746 kL	approx. 167 kL (fresh water)		approx. 8,613 kL	approx. 235 kL (fresh water)		approx. 8,968 kL
May 13, 2011	approx. 191 kL (fresh water)		approx. 7,936 kL	approx. 166 kL (fresh water)		approx. 8,780 kL	approx. 287 kL (fresh water)		approx. 9,255 kL
May 14, 2011	approx. 184 kL (fresh water)		approx. 8,120 kL	approx. 161 kL (fresh water)		approx. 8,940 kL	approx. 275 kL (fresh water)		approx. 9,530 kL
May 15, 2011	approx. 0 kL (fresh water)		approx. 8,120 kL	approx. 0 kL (fresh water)		approx. 8,940 kL	approx. 0 kL (fresh water)		approx. 9,530 kL
	Total	approx. 10,859 kL		Total	approx. 18,137 kL		Total	approx. 14,026 kL	

Status of Water Injection to Spent Fuel Pool of Fukushima Daiichi Nuclear Power Station

Unit 1

Date	Measure	Type	Amount of Water Injection(t)
3/31 13:03～16:04	TEPCO concrete pumping vehicle(62m class)	Fresh water	90
4/2 17:16～17:19	TEPCO concrete pumping vehicle(62m class)	Fresh water	(Confirm the location of spray water)
5/13 16:04～19:04 (spray water)	TEPCO concrete pumping vehicle (62m class)	Fresh water	(Confirm the location of spray water)
5/14 15:07～15:18 (spray water)	TEPCO concrete pumping vehicle (62m class)	Fresh water	－ (Spray water was canceled due to strong wind)

Unit 2

Date	Measure	Type	Amount of Water Injection(t)
3/20 15:05～17:20	FPC	Sea water	40
3/22 16:07～17:01	FPC	Sea water	18
3/25 10:30～12:19	FPC	Sea water	30
3/29 16:30～18:25	FPC	Fresh water	15～30
3/30 19:05～23:50	FPC	Fresh water	below 20
4/1 14:56～17:05	FPC	Fresh water	70
4/4 11:05～13:37	FPC	Fresh water	70
4/7 13:29～14:34	FPC	Fresh water	36
4/10 10:37～12:38	FPC	Fresh water	60
4/13 13:15～14:55	FPC	Fresh water	60
4/16 10:13～11:54	FPC	Fresh water	45
4/19 16:08～17:28	FPC	Fresh water	47
4/22 15:55～17:40	FPC	Fresh water	50
4/25 10:12～11:18	FPC	Fresh water	38
4/28 10:15～11:28	FPC	Fresh water	43
5/2 10:05～11:40	FPC	Fresh water	55
5/6 9:36～11:16	FPC	Fresh water	58
5/10 13:09～14:45	FPC	Fresh water	56
5/15 13:00～14:37	FPC	Fresh water	56

Status of Water Injection to Spent Fuel Pool of Fukushima Daiichi Nuclear Power Station

Unit 3

Date	Measure	Type	Amount of Water Injection(t)
3/17 9:48～10:01	Helicopter, Self-Defense Force	Sea water	30
3/17 19:05～19:13	The riot's high-pressure water cannon truck	Sea water	44
3/17 19:35～,19:45～,19:53～, 20:00～,20:07～20:09	High-pressure water cannon truck, Self-Defense Force	Real water	30
3/18 approx. 14:00～14:38	High-pressure water cannon truck, Self-Defense Force	Real water	40
3/18 14:42～14:45	High-pressure water cannon truck, US Forces	Real water	2
3/19 0:30～1:10	Bending spray tower vehicle etc, Tokyo Fire Department	Sea water	60
3/19 14:10～3/20 3:40	Bending spray tower vehicle etc, Tokyo Fire Department	Sea water	2430
3/20 approx. 21:36～3/21 3:58	Bending spray tower vehicle etc, Tokyo Fire Department	Sea water	1137
3/22 15:10～15:59	Bending spray tower vehicle etc, Tokyo Fire Department (Tokyo Fire Department･Osaka municipal Fire Department)	Sea water	150
3/23 11:03～13:20	FPC	Sea water	35
3/24 approx. 5:35～approx. 16:05	FPC	Sea water	120
3/25 13:28～16:00	Bending spray tower vehicle etc, Tokyo Fire Department	Sea water	450
3/27 12:34～14:36	TEPCO concrete pumping vehicle(52m class)	Sea water	100
3/29 14:17～18:18	TEPCO concrete pumping vehicle(52m class)	Fresh water	100
3/31 16:30～19:33	TEPCO concrete pumping vehicle(52m class)	Fresh water	105
4/2 9:52～12:54	TEPCO concrete pumping vehicle(52m class)	Fresh water	75
4/4 17:03～19:19	TEPCO concrete pumping vehicle(52m class)	Fresh water	70
4/7 6:53～8:53	TEPCO concrete pumping vehicle(52m class)	Fresh water	70
4/8 17:06～20:00	TEPCO concrete pumping vehicle(52m class)	Fresh water	75
4/10 17:15～19:15	TEPCO concrete pumping vehicle(52m class)	Fresh water	80
4/12 16:26～17:16	TEPCO concrete pumping vehicle(62m class)	Fresh water	35
4/14 15:56～16:32	TEPCO concrete pumping vehicle(62m class)	Fresh water	25
4/18 14:17～15:02	TEPCO concrete pumping vehicle(62m class)	Fresh water	30
4/22 14:19～15:40	TEPCO concrete pumping vehicle(62m class)	Fresh water	50
4/26 12:00～12:02	TEPCO concrete pumping vehicle(62m class)	Fresh water	(confirmed water surface)
4/26 12:25～14:02	FPC	Fresh water	47.5
5/8 11:38 (measured water level) 12:10～14:10 (water injection) 14:10～14:50 (measured water level、sampling)	FPC	Fresh water	(measured water level、sampling) 60
5/9 12:14～15:00 (water injection) (measured water level around the time of water injection)	FPC	Fresh water	(measured water level) 80

Unit 4

Date	Measure	Type	Amount of Water Injection(t)
3/20 8:21～9:40	High-pressure water cannon truck, Self-Defense Force	Real water	80
3/20 18:30頃～19:46	High-pressure water cannon truck, Self-Defense Force	Real water	80
3/21 6:37～8:41	High-pressure water cannon truck, Self-Defense Force	Real water	90
3/21 8:38～8:41	High-pressure water cannon truck, US Forces	Real water	2.2
3/22 17:17～20:32	TEPCO concrete pumping vehicle(58m class)	Sea water	150
3/23 10:00～13:02	TEPCO concrete pumping vehicle(58m class)	Sea water	125
3/24 14:36～17:30	TEPCO concrete pumping vehicle(58m class)	Sea water	150
3/25 6:05～10:20	FPC	Sea water	21
3/25 19:05～22:07	TEPCO concrete pumping vehicle(58m class)	Sea water	150
3/27 16:55～19:25	TEPCO concrete pumping vehicle(58m class)	Sea water	125
3/30 14:04～18:33	TEPCO concrete pumping vehicle(58m class)	Fresh water	140
4/1 8:28～14:14	TEPCO concrete pumping vehicle(58m class)	Fresh water	180
4/3 17:14～22:16	TEPCO concrete pumping vehicle(58m class)	Fresh water	180
4/5 17:35～18:22	TEPCO concrete pumping vehicle (62m class)	Fresh water	20
4/7 18:23～19:40	TEPCO concrete pumping vehicle (62m class)	Fresh water	38
4/9 17:07～19:24	TEPCO concrete pumping vehicle (62m class)	Fresh water	90
4/13 0:30～6:57	TEPCO concrete pumping vehicle (62m class)	Fresh water	195
4/15 14:30～18:29	TEPCO concrete pumping vehicle (62m class)	Fresh water	140
4/17 17:39～21:22	TEPCO concrete pumping vehicle (62m class)	Fresh water	140
4/19 10:17～11:35	TEPCO concrete pumping vehicle (62m class)	Fresh water	40
4/20 17:08～20:31	TEPCO concrete pumping vehicle (62m class)	Fresh water	100
4/21 17:14～21:20	TEPCO concrete pumping vehicle (62m class)	Fresh water	140
4/22 17:52～23:53	TEPCO concrete pumping vehicle (62m class)	Fresh water	200
4/23 12:30～16:44	TEPCO concrete pumping vehicle (62m class)	Fresh water	140
4/24 12:25～17:07	TEPCO concrete pumping vehicle (62m class)	Fresh water	165
4/25 18:15～4/26 0:26	TEPCO concrete pumping vehicle (62m class)	Fresh water	210
4/26 16:50～20:35	TEPCO concrete pumping vehicle (62m class)	Fresh water	130
4/27 12:18～15:15	TEPCO concrete pumping vehicle (62m class)	Fresh water	85
4/28 11:43～11:54	TEPCO concrete pumping vehicle (62m class)	Fresh water	(measured water level)

(Exhibit－2)

4/28　11:55～12:07	TEPCO concrete pumping vehicle (62m class)	Fresh water	(sampling)
4/29　10:29 (measured water level)、10:35 (measured temperature)	TEPCO concrete pumping vehicle (62m class)	Fresh water	(measured water level、measured temperature)
4/30　10:14～10:28 (measured water level、measured temperature)	TEPCO concrete pumping vehicle (62m class)	Fresh water	(measured water level、measured temperature)
5/1　10:32～10:38 (measured water level、measured temperature)	TEPCO concrete pumping vehicle (62m class)	Fresh water	(measured water level、measured temperature)
5/2　10:10～10:20 (measured water level、measured temperature)	TEPCO concrete pumping vehicle (62m class)	Fresh water	(measured water level、measured temperature)
5/3　10:15～10:23 (measured water level、measured temperature)	TEPCO concrete pumping vehicle (62m class)	Fresh water	(measured water level、measured temperature)
5/4　10:25～10:35 (measured water level、measured temperature)	TEPCO concrete pumping vehicle (62m class)	Fresh water	(measured water level、measured temperature)
5/5　11:55～12:05 (measured water level、measured temperature) 12:19～20:46 (spray water)	TEPCO concrete pumping vehicle (62m class)	Fresh water	(measured water level、measured temperature) 270
5/6　12:16 (measured water level、measured temperature) 12:38～17:51 (spray water)	TEPCO concrete pumping vehicle (62m class)	Fresh water	(measured water level、measured temperature) 180
5/7　11:00 (measured water level、underwater photography、sampling) 14:05～17:30 (spray water)	TEPCO concrete pumping vehicle (62m class)	Fresh water	(measured water level、underwater photography、sampling) 120
5/9　16:05～19:05 (spray water)	TEPCO concrete pumping vehicle (62m class)	Fresh water	100
5/11　16:07～19:38 (spray water)	TEPCO concrete pumping vehicle (62m class)	Fresh water	120
5/13　16:04～19:04 (spray water)	TEPCO concrete pumping vehicle (62m class)	Fresh water	100

Fukushima Nuclear Power Station 1～4, Single Wire Circuit Diagram, Temporary Power

(Utilize 3L of Okuma Line)

66/6.9kV
10MVA

1L of Yonomori Line
66kV

For transferring use MC

(Multi-circuit switch1)

(Multi-circuit switch 2)

Temporary Line 3/4 M/C A

Temporary Common PoolP／C

Power Source Car

Temporary Line 3/4 M/C B

TEPCO Nuclear Line・1L of Yonomori Line Power source connection (4/19)

1F-4 P/C 4D

Unit 4, Received power to the panel for main line for measuring main bus conductor

Unit 3, Received power to the panel for measureing main bus conductor

Unit 3, Central Control Plate, Light Distribution board

Unit 3, Light of Central Control room

Unit 4, Central Control Room, Light Distribution board

Unit 4, Central Control Plate Light

AC Distribution board

Central Control Plate

Tohoku Electric Power 66kV
TEPCO Nuclear Line

Spare Transformer
4500kVA

6.9kV Spare TransformerM/C

Temporary Line 1/2 M/C A

Main Anti-Earthquake Building, Line 5 of power line

1F-2 P/C 2C

Unit 2, Central Control Room, Light Distribution board

Unit 2, Central Control room light

Temporary distribution plate

2号立坑水中ポンプ

Unit 2, Switching plate for measuring

Main Control room for distribution plate

Main Control room for measuring plate

Unit 1, Central Control Room, Light Distribution board

Unit 1, Central Control room Light

Unit 1, Received power to the panel for measureing main bus conductor

AC Distribution board

Central Control Plate

Power source for monitoring post (regular side) MP5～8

2L of Yonomori Line
66kV

Starting Transformer 5SA
55MVA/30MVA×2

M/C6C

M/C6D

D/G6A

D/G6B

P/C5B-1

P/C5A-1

P/C6C

P/C6D

Higashidori Nuclear Line・2L of Yonomori Line Power source connection (4/25)

Temporary Line 1/2 M/C B

440V

210V, 220V, 110V

Unit 1～4, Feed pump for concrete pumping vehicle

③In front of Information building(1)

Fire pumping vehicle for backup (one vehicle)

440V

210V

Power source car

Unit 1, Power source for N2 injection facility

⑨In front of Information building(2)

N_2 injecting facility with D/G for backup

200V

D/G

Unit 1～3, Power source for reactor water injection pump

Fire pumping vehicle for backup (more than 3 vehicles)