



Our challenges since the Fukushima nuclear accident

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First of all, on behalf of Tokyo Electric Power Company (TEPCO), I would like to extend my deepest appreciation for the immeasurable support received from all over the world in assisting us with the restoration from the accident at the Fukushima Daiichi Nuclear Power Station on 11th March 2011, and the subsequent reactor decommissioning work.

We are now doing our best to fulfill all of our responsibilities for the accident and achieve the revitalisation of Fukushima, measures which are essential to TEPCO's reform and restoration efforts. To this end, we will put forth our utmost efforts into compensation payouts, decommissioning, decontamination and the revitalisation of Fukushima, while achieving a stable power supply and thorough business streamlining.

Accident overview and recovery work

At the moment the earthquake, which was one of the largest ever recorded in Japan (M9.0), struck on 11 March 2011, the nuclear fission chain reaction was stopped by an automatic shutdown with all control rods inserted at Units 1 to 3, which were then in operation. The emergency generator started up after the off-site power was lost due to

the impact of the earthquake. However, emergency power then became unavailable, with the exception of Unit 6, due to flooding by the subsequent tsunami, which was also one of the largest in history. Eventually, all cooling functions of Units 1 to 3 were lost. Alternative water injection using fire engines was conducted as an on the spot measure, but consequently, there remained a certain period of time where water could not be injected into the reactors in Units 1 to 3. This damaged the fuel cladding, which led to the generation of a substantial amount of hydrogen due to a chemical reaction with the steam. Subsequently, in Units 1 and 3, explosions, which appeared to be caused by hydrogen leakage from each of the Primary Containment Vessels (PCV), destroyed the upper structures of their respective reactor buildings.

Units 1 to 3 have now been in a cold shut-down condition since December 2011. We are planning to remove the spent fuel from Unit 4's pool from this November. This is earlier than the previous plan. The removal process is expected to be completed by the end of 2014. We have been treating the accumulated water, which contains highly concentrated radioactive materials, in the Central Radioactive Waste Treatment Facility. Treatment is carried out taking into account the storage situation and the transfer of Accumulated Water Storage Facilities. The contaminated water continues to increase, and this has become a major issue for us in terms of maintaining the plant's condition and performing decommissioning work.

On 26 August 2013, TEPCO established the "Contaminated Water & Tank Countermeasure Division" to reinforce the fundamental measures we are taking. In addition to intensive use of the company's own resources, TEPCO has been employing the advice, expertise and know-how of both domestic and international experts. We have been making every effort to resolve this problem as the highest priority management matter.

Steel frame for fuel removal at Unit 4 of Fukushima Daiichi Nuclear Power Station



Impact of the nuclear shutdown and new safety standards

Following the accident, other nuclear power stations in Japan that were undergoing periodic inspections were sequentially shut down. As of July 2013, 48 of the 50 nuclear reactors in Japan have been shut down. As a result, dependence on thermal power generation, especially LNG, has significantly increased. Therefore, the financial situation of Japanese utilities has worsened due to the increase in fuel costs. Japan ran a trade deficit in 2011 for the first time in 31 years and the deficit expanded to 6.9 trillion yen in 2012. The reduction of fuel costs is a pressing issue. Since the ratio of thermal power in the generation mix has increased, CO₂ emission intensities in 2011 worsened by approximately 20 per cent, compared with the situation in 2010, prior to the Great Earthquake. The shutdown of nuclear power stations has had a considerable impact on global warming.

The nuclear accident led the former ruling party, the Democratic Party of Japan, to move ahead with cabinet approval of the “Innovative Strategy for Energy and the Environment” in September 2012, stating that it would be possible to manage Japan’s power supply without nuclear

power by the 2030s. In contrast, after the change of administration to the Liberal Democratic Party in December 2012, Prime Minister Shinzo Abe expressed his intention to restart “nuclear power plants whose safety has been confirmed.” This shows that the “Zero Nuclear Energy” mindset has been set aside, and that a movement to restart the nuclear power plants is now in place.

The Nuclear Regulation Authority (NRA) in Japan released new safety standards for light-water reactor nuclear plants in July 2013. They are to be applied in order to assess restart or new construction requests. The New Standards consist of compulsory measures for severe accidents, such as vent filters, important anti-seismic buildings, power sources and so on, together with preparations for multiple countermeasures in the event of a maximum scale earthquake and tsunami.

It is extremely important to restart nuclear power plants approved by the NRA to serve as the base load of Japan’s power supply. To achieve this end, it is necessary not only to enforce safety measures to meet the New Safety Standards, but also to obtain the understanding of the local communities and society. Therefore, we will do our best to rebuild trust and to win support from the local communities

Flood barrier wall at Unit 1 of Kashiwazaki-Kiriwa Nuclear Power Station



and society by steadily implementing safety measures and complying with the new safety standards.

Challenges on nuclear reform

In response to the accident at Fukushima, we strongly desire to be a nuclear power plant operator with the world's highest levels of safety awareness, engineering capabilities and risk communication ability with society. Thus, we established the "Nuclear Reform Special Task Force," directly under the president, last September in order to reform TEPCO's safety culture, disaster prevention measures, risk/crisis control protocols, information disclosure, and risk communication methods. At the same time, we established the "Nuclear Reform Monitoring Committee," comprised of Dr Dale Klein, former Chairman of the US Nuclear Regulatory Commission, and other Japanese and foreign experts. The committee functions as an advisory organisation, monitoring our progress and implementation of reforms from a purely external point of view.

In March of this year, we developed the "Nuclear Safety Reform Plan," which includes lessons and countermeasures relating to the strengthening of facilities, and their operation and management. For instance, with regard to the facility countermeasures, every safety stage of Defence in Depth (D in D) will be implemented, so that serious situations will be more easily prevented even if external events exceed design base assumptions. High-pressure injection systems are to be strengthened to prepare for the event of a Station Black Out (SBO) and design requirements of Primary Containment Vessels (PCV) are to be defined.

As a management enhancement, we established the "Nuclear Safety Oversight Office" in May of this year to improve oversight and support management by assisting the TEPCO directors in decision making. This is an internal regulatory organisation directly under the board of directors. The head of the office is Dr. John Crofts, former Director in charge of security assurance of the United Kingdom Atomic Energy Authority. We have also enhanced our D in D abilities, by reviewing work processes and organising an appropriate working environment to effectively promote the improvement of processes. With regard to the enhancement of our risk communication activities, as there was a disconnect between our way of thinking and the standards accepted by society, we established the "Social Communication Office" (SC office), directly under the president, in April of this year. The function of the SC office

is to enhance risk communication activities and resolve our organisational issues, by promoting an improvement of our corporate culture and risk communication in compliance with social standards. It is also intended to provide the necessary direction to internal organisations in order to improve information disclosure. The SC office is comprised of approximately 24 "risk communicators," who undertake communications with those outside the company from a social perspective. Furthermore, in emulation of the Incident Command System (ICS), which serves as a standardised emergency response structure in the U.S., we reorganised the emergency nuclear disaster prevention organisations at power plants and our Head Office.

Realising the "Intensive Reform Implementation Action Plan"

In accordance with the "Management Policy towards Restoration" established in November of last year, we recognise that TEPCO's reforms begin by facing up to the Fukushima accident. To this end, we have established our new mission to "fulfill all of our responsibilities for the accident and realise the world's highest standards of safety while achieving a stable power supply in a competitive environment." At the same time, we will realise the "Intensive Reform Implementation Action Plan" based on the Management Policy.

The "FY 2013 Business Operation Policy" summarises the measures to be intensively implemented in FY 2013 and 2014 and sets down the implementation plans for the following four intensive measures, and the steps towards achieving the 71 points detailed in the Action Plan. They include measures towards the "revitalisation of Fukushima"; nuclear safety measures; thorough cost reduction and management to ensure survival; and management reforms via the introduction of the in-house company system.

In terms of building a revenue base towards restoration for the re-born TEPCO, we will proceed not only with domestic projects, such as framework development for the mass introduction of renewable energy, network utilisation environment, and total solutions as customer services, but also with our fuel businesses and overseas projects. For instance, we aim to triple the profit from IPP project investments and double the sales from our overseas consulting business by 2020. Based on the "FY 2013 Business Operation Policy," management will dedicate all of its efforts towards the implementation of thorough corporate reforms and to achieving our new mission. 