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Urgent Proposal Regarding the Accident at the Fukushima Nuclear Power Plant

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1. Although the accident at the Fukushima nuclear power plant was caused by a massive, unprecedented earthquake and the tsunami that followed, the core meltdowns and emissions of radioactive substances and the large-scale evacuation of local inhabitants rendered it a major nuclear power plant accident on a par with Chernobyl. It is extremely regrettable that this accident resulted in a loss of confidence in the safety of nuclear power generation, as the Fukushima area, understandably, became an example of the threat of nuclear hazard to the people of Japan and the world.

The Japanese government and Tokyo Electric Power Company (TEPCO) have a duty to continue maximum efforts to prevent the spread of the damage, to reflect deeply on what brought about this situation, and to thoroughly probe the causes of the accident in cooperation with other concerned nations and international institutions—such as the IAEA—that not only maintain copious information on previous nuclear accidents but are also closely involved in the peaceful use of nuclear power. Beyond this, however, they also have an obligation to conduct scientific investigations and assessments on the suitability of their crisis avoidance measures, the appropriateness of the local populace evacuation, and the measures taken to prevent damage caused by radiation. They should publish the results and draw lessons from them. In particular, it is essential that they provide detailed information to other nations and make a contribution to safety of nuclear power generation worldwide.

2. The most serious problem in the recent accident was that there was no single command-and-control function for disaster countermeasures—instead, the command structure was complicated, and the precise authority and obligations of the different leaders concerned were unclear in the extreme. The facilities and mechanisms which had been developed for anticipating a nuclear disaster were not fully utilized; in addition, problems were compounded by the ad hoc organizations and executive positions that were created at the time. Attempts must be made to fully comprehend the realities of this system and to drastically revise it.

A number of government departments are involved in safety regulation for the nuclear power industry, including the Cabinet Office's Nuclear Safety Commission; the Ministry of Economy, Trade, and Industry's Nuclear and Industrial Safety Agency; the Ministry of Education, Culture, Sports, Science, and Technology; and the Ministry of Health, Labour, and Welfare. As a result, authority is dispersed, and it is unclear where overall command and control reside. It became evident that not only were the standards for safety regulation inadequate, but also that there were no standards at all regarding radiation doses in food and soil. The administrative structure for safety regulation needs to be thoroughly overhauled.

Japan should establish a new Emergency Management Agency (or similarly named body), which would engage in disaster prevention activities and respond flexibly to emergencies in times of major earthquakes, tsunamis, or typhoons that involve a nuclear disaster. This newly established organization should comprise active units that combine personnel from the Self-Defense Forces, the Fire and Disaster Management Agency, the National Police Agency, and the Japan Coast Guard. It should maintain the

equipment necessary for special operations, engage in continuous practical training, and also serve as an organization that would respond to requests from overseas. As well as an administrative function, it should also maintain a first-class research function with regard to disasters and disaster prevention, which should also include participation by experts and researchers from both Japan and overseas.

3. The government will be giving future consideration to permanent measures based on the investigation of the causes of the accident, at which time the following points ought to be considered:

(1) Regarding the issue of where to locate nuclear power plants, safety standards must be revised based on the latest information on earthquakes, tsunamis, and other disasters, with due consideration given to proper safety factors. These revisions must be made immediately, and countermeasures against earthquakes and tsunamis (such as the fortification of breakwaters and the genuine multiplexing of emergency cooling functions) must be implemented at existing nuclear power plants—regardless of the expense. It has also been pointed out that the concentrated deployment of as many as six reactors in a single location represents a problem, and proper verification should also be carried out on this score.

It is believed that the reason why all the multiple safeguards (which represent the very foundation of nuclear safety) malfunctioned one after the other, such that the entire facility at Fukushima suffered a blackout, was that electrically powered equipment vital for powering the protection systems was situated underground.

In addition, the safety measures for the pools containing the spent fuel rods have hitherto been inadequate compared to the safety measures for the nuclear reactors themselves. These must be reconsidered.

(2) As well as strengthening safety measures to prevent accidents, Japan must also radically expand and strengthen measures to limit damage to an absolute minimum when an accident does occur.

(i) The initial reaction in response to a nuclear disaster is extremely important. On this occasion, a combined government-TEPCO headquarters was set up to deal with the accident; however, the government should develop an integrated rapid-response system incorporating nuclear power operators.

The Act on Special Measures Concerning Nuclear Emergency Preparedness was enacted as a special law based on the Basic Act on Disaster Control Measures, which prescribes collaboration between local government and the national government regarding measures to be taken in response to disasters such as typhoons and earthquakes. In view of the distinctive nature of nuclear disasters, this law should be reworked to enable a rapid and flexible response that is directed by the government in times of emergency. The government should also attempt to accumulate a wide-range of specialist knowledge, so as to enable rapid decision-making.

(ii) In the recent accident, the Self-Defense Forces, the Fire and Disaster Management Agency, the National Police Agency, and the Japan Coast Guard played active roles to prevent the spread of damage. However, there was confusion over the spraying of water to cool the reactors, as there was no consensus regarding the question of which organization bore responsibility for this. As well as revising the Act on Special Measures Concerning Nuclear Emergency Preparedness and clarifying matters such as the division of roles in times of emergency, the government should work to upgrade equipment and improve joint training, and should rapidly implement genuinely realistic special training for nuclear disasters, using scenarios that anticipate the worst possible circumstances.

In particular, systemic improvements should be made so as to give the Self-Defense Forces an independent role right from the initial stages of an emergency that involves a nuclear disaster—in view of the highly valuable contribution which they

made on this occasion (dispatch to nuclear and other disasters being one of their essential missions). This included spraying water, transporting equipment and materials, removing obstructions, conducting decontamination operations, and cooperating with the US military.

(iii) The Japanese have not done well in preparing for a serious situation. By way of example, despite the fact that research and development on robots for hazardous environments was underway in anticipation of a nuclear disaster, there was no actual demand for them from the power companies, who judged that possessing such robots would cause unease regarding the safety of nuclear power. In the USA and France, the opposite mindset prevails. Japan needs to change its thinking with regard to the prevention of nuclear disaster.

(iv) The decision to accept relatively little damage in order to avoid major consequences requires decisiveness on the part of the various people in positions of responsibility. It is necessary to verify the appropriateness of various decisions—for example, the injection of seawater in order to cool reactors, the venting to avoid hydrogen explosions, and the delay in announcing the system for assessing the effects of radioactivity (for fear of public panic). However, the relatively swift decisions to evacuate inhabitants and to have people take shelter indoors are worthy of praise.

The ability to make difficult decisions under severe conditions is ultimately a question of the leadership skills of the people in the various positions of responsibility. However, in order to help them make more appropriate decisions, criteria must be established in advance with regard to specific decisions, practical training must be conducted on a regular basis, and the skills of the people in charge must be improved. In addition, the government must retain and nurture personnel who are knowledgeable about the safety of the entire nuclear power system, who can make appropriate choices and technical decisions based on limited data, and who can present the options and points of issue to those in charge.

(v) In the course of the relief operations for the current case, it became apparent that protective suits, dosimeters, emergency communication devices, and radiation-proof machinery and tools were in short supply, while unmanned observation instrumentation, work machinery, and robots were unavailable. The nine Japanese power companies should establish a joint disaster prevention organization, for which the government should assume part of the financial burden. This organization should maintain sufficient equipment and materials, and retain specialist personnel. A system should be created that enables the Self-Defense Forces, the Fire and Disaster Management Agency, the National Police Agency, and the Japan Coast Guard to participate in the planning for this joint disaster prevention organization, with special consideration given to joint practical training and the transportation of equipment and materials.

4. Nuclear power had come to be regarded as the trump card in energy policy, in terms of a stable energy supply and the battle against global warming. However, this accident has shaken public confidence in the safety of nuclear power. Japan must drastically revise its medium- to long-term energy policy. This is not a problem that Japan faces alone—rather, it signifies the fact that reconciling resource limitations and measures to combat global warming with worldwide economic development (including that of newly emerging nations) represents an extremely difficult issue.

For the time being, dependence on fossil fuels such as oil, coal, and natural gas continues to increase in quantitative terms; however, issues such as the depletion of resources, skyrocketing resource prices, and the rolling back of measures to combat global warming remain. In order to reduce the levels of carbon dioxide generated in the future, it will be necessary to forcefully promote zero-emission thermal power generation, in combination with more efficient thermal power plants, high-efficiency

oil-refining, the integrated coal gasification combined cycle, and clean-coal technology, as well as the capture and storage of carbon dioxide.

In order to increase the adoption of recyclable energy such as solar and wind power, it will be necessary to develop innovative new technologies (as well as improve existing technology), and to actively promote the infrastructure development that will allow the introduction of distributed energy supply systems—by means of research and development work on technologies such as storage batteries, superconducting power transmission, hydrogen supply systems, and smart grids.

5. Since Japan relies heavily on nuclear power for its electricity supply, and since the energy demand from Japanese industry and Japanese households is principally for electricity, there will be severely increased pressure on electricity supply and demand over the next few years. It must be recognized that it is only the enormous efforts of the electricity suppliers to increase the prominence of nuclear power generation that have made electricity such an inexpensive form of energy in Japan and that have enabled Japan to succeed in reducing its carbon dioxide emissions.

The Japanese people will need to summon the determination to endure inconvenience and high prices, and the resolution to conserve energy.

6. In its efforts to deal with the current accident, Japan benefited from superbly effective, wide-ranging cooperation and support from other concerned nations and from international institutions such as the IAEA. On this evidence, Japan should actively promote collaboration and cooperation with international institutions that possess in-depth and wide-ranging knowledge of the peaceful use of nuclear power and with other involved nations in order to further improve the safety of nuclear power generation. Japan must also take urgent measures to correct the damaging rumors circulating internationally that affect Japanese products such as agricultural produce and Japan's tourist industry.

7. Japan has embraced the peaceful use of nuclear power throughout both the public and private sectors as a matter of national policy. Devoid of resources after its defeat in World War Two, Japan was able to stage a miraculous recovery and achieve high rates of growth. These achievements were based on the development of hydraulic power on a large scale, a switch to oil-fired thermal power, and the rapid adoption of nuclear power (despite various difficulties), which ensured that the nation was kept supplied with sufficient electricity to enable improvements in people's lives and to allow industrial development. In marked contrast, newly emerging nations are confronted by electricity shortages. In addition, the price of electricity affects the international competitiveness of a wide range of industries, and a high-quality electricity supply is obviously essential to the survival of the high-tech industry. With humanity urgently needing to resolve the problem of global warming, there have been great expectations for nuclear power in terms of its ability to supply energy in abundance and to serve as the driving force behind worldwide economic development.

However, in some senses Japan has reaped the benefits for too long, while remaining only dimly aware of the dangers. Although a course correction in nuclear power policy is required in Japan, any moves to cease nuclear power generation completely would rob the nation of its strength. Science and technology are the result of human wisdom, and the advances made contribute greatly to society's development and well-being; however, they can also bring about major damage—as in the current circumstances. The key is to use wisdom in our efforts.

Using all the strength and resources of its public and private sectors, Japan must clarify the mechanisms behind large-scale natural disasters such as earthquakes, pursue research into the safe usage of nuclear power, promote advances in the science and technology for medical radiation treatment, make full use of the lessons from the recent

nuclear accident, overcome the effects, and make contributions to safer nuclear power generation.