

PARTICIPATION IN THE INDEPENDENT INVESTIGATION COMMISSION ON THE FUKUSHIMA DAI-ICHI NUCLEAR ACCIDENT

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I. *Establishment of the IIC*

The March 11, 2011 magnitude 9.0 earthquake, the largest in Japanese history, and the subsequent tsunami caused devastation across eastern Japan, and the natural disaster dealt a heavy and direct blow to the Fukushima Dai-ichi Nuclear Power Plant (the seismic intensity was Shindo 6 in the area of the plant). This serious accident was declared a Level 7 event, on a par with the 1986 Chernobyl accident, on the International Nuclear Event Scale (INES) established by the International Atomic Energy Agency (IAEA) (the Three Mile Island accident was Level 5), making this quite literally a triple disaster or even, if the environmental contamination is included, a quadruple disaster.

The nuclear reactor currently appears to be in cold shutdown, and concerns over future hydrogen explosions or recriticality have eased for the time being, but the melted-down core remains present and contaminated water continues to pool. Decommissioning such a reactor with a melted-down core is likely to take several decades. More than 100,000 people have been exposed to radiation and/or evacuated, with no prospects for many of returning to their original homes. Decontamination will also no doubt require unimaginable time and effort.

In line with the saying “nuclear accidents know no borders,” this nuclear plant accident has reverberated globally, with no little impact on the rest of the world as well as Japan. To prevent any repeat of such accident and minimize the impact of any accident that should occur, a full-scale investigation was deemed necessary to investigate the accident, to thoroughly determine its causes, consider future steps and determine what should be reflected in future nuclear power policy.

To those ends, several investigation commissions were created, the principal among them being that organized by Tokyo Electric Power Company (TEPCO) itself, the one set up by the Japanese government (chaired by Yotaro Hatamura, Professor Emeritus, University of Tokyo), and the one quite exceptionally created by the Diet (chaired by Kiyoshi Kurokawa, former President, Science Council of Japan). The TEPCO Commission was subject to scrutiny by outside commissions due to TEPCO’s own role as a party directly connected with the accident, but its report will inevitably be regarded as self-vindication. The investigations now underway by the government and by the Diet scheduled to be concluded in June do enjoy significant authority and powerful backing, but concerns remain about how willing/able these commissions will be to pursue the Japanese government’s own liability in the accident. Consequently, a self-funded private-sector “Independent Investigation Commission” was established to examine the

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accident from an independent standpoint with no constraints.

This Independent Investigation Commission (IIC) was established in October 2011 and, after an investigation lasting about six months, the IIC announced its findings on February 28, 2012. The report was about 400 pages in length.

The Commission comprised the following six persons:

Chair	KITAZAWA Koichi (former President, Japan Science and Technology Agency)
Member	ENDO Tetsuya (former Chair, Board of Governors, International Atomic Energy Agency)
Member	TADAKI Keiichi (attorney at law)
Member	NONAKA Ikujiro (Professor Emeritus, Hitotsubashi University)
Member	FUJII Mariko (Professor, Research Center for Advanced Science and Technology, University of Tokyo)
Member	YAMAJI Kenji (Director General, Research Institute of Innovative Technology for the Earth)

As can be seen from this list, these six persons come from a wide range of academic backgrounds — including a natural scientist, social scientists, an attorney, and a diplomat — with Mr. Yamaji the sole specialist on nuclear power technology. The research and investigation needed to prepare the report was carried out by a working group of about 30 persons — mid-level and young university and think-tank researchers, attorneys, etc. — established under the IIC.

II. *Research/Investigation by the IIC*

In the course of this inquiry, extended interviews were conducted with more than 300 concerned parties, including the previous prime minister Naoto Kan (the interview with Prime Minister Kan lasted about three hours); the names of the interviewees are listed below in no particular order.

KAN Naoto, former Prime Minister
 EDANO Yukio, Minister of Economy, Trade and Industry (formerly Chief Cabinet Secretary)
 KAIEDA Banri, former Minister of Economy, Trade and Industry
 HOSONO Goshi, Minister of the Environment, Nuclear Disaster Minister
 FUKUYAMA Tetsuro, former Deputy Chief Cabinet Secretary
 OTSUKA Kohei, former Vice Minister of Health, Labor and Welfare
 KONDO Shunsuke, Chair, Japan Atomic Energy Commission
 MADARAME Haruki, Chair, Nuclear Safety Commission of Japan
 KUKITA Yutaka, Deputy Chair, Nuclear Safety Commission of Japan
 FUKANO Hiroyuki, Director General, Nuclear and Industrial Safety Agency
 HIROSE Kenkichi, Special Advisor, Cabinet Office
 KOSAKO Toshiso, Professor, University of Tokyo (then Special Advisor to the Cabinet)
 TASAKA Hiroshi, Professor, Graduate School, Tama University (then Special Advisor to

the Cabinet)
 SHIMOMURA Kenichi, Councilor, Cabinet Secretariat
 MORIGUCHI Yasutaka, Administrative Vice Minister, Ministry of Education, Culture, Sports, Science and Technology
 TANIGUCHI Tomihiro, former Deputy Director General, International Atomic Energy Agency
 FUKUSHIMA Nobuyuki, Member, House of Representatives of Japan
 SAKAI Kazuo, Research Center for Radiation Protection, National Institute of Radiological Sciences
 YOSHIOKA Hitoshi, Deputy Dean, Kyushu University (Member, Governmental Investigation Committee on the Accident at the Fukushima Nuclear Power Station)

Although we were able to speak with former personnel of Tokyo Electric Power Company (TEPCO), we were unfortunately unable to secure any cooperation whatsoever from the company's current management team, and no satisfactory explanation was forthcoming from the Nuclear and Industrial Safety Agency and the Ministry of Education, Culture, Sports, Science and Technology. Because cooperation with the IIC inquiry was voluntary, unlike those conducted by the government and the Diet, nothing could be done in this respect.

III. *Major Problems and Recommendations Noted in the Report*

The report consisted of four parts: Part I: Account of the Accident and Damage, Part II: Responses to the Nuclear Power Plant Accident, Part III: Analysis of Historical/Structural Factors, and Part IV: Global Context. Parts I and II made significant use of the interim report from the government's accident inquiry, while Parts III and IV were unique to the IIC. At the risk of appearing self-serving, the IIC report probed deeply into problems without reservation. According to this report, the Fukushima accident was, it goes without saying, triggered by the earthquake and tsunami, i.e. "natural disasters," but the element of "man-made disaster" looms large in turning these natural disasters into such a serious accident. There are no "ifs" in history but, if Japan had humbly lent an ear to outside opinions, if the nuclear power facilities had been properly designed, or if sufficient preparations had been made to withstand severe accidents, this major event might have been avoided or, at the very least, its impact could have been significantly reduced.

Humans are admittedly somewhat helpless in the face of "natural disasters," but the author is convinced that many "man-made disasters" could be overcome by exercising human wisdom.

Following, in no particular order, is a list of the problems pointed out in the report:

- The "myth of absolute safety" that regarded any discussion of nuclear power disasters as taboo was a fundamental factor in the accident.

The regulatory authorities and power companies were not alone in buying into this myth — they were joined in this respect by local residents as well as the general public — which created circumstances that hampered discussion of the potential for an accident. Conversely, an upsurge in anti-nuclear campaigns contrarily prompted efforts to bolster the myth.

- Organizational laxity at TEPCO and in government caused them to neglect preparations for a severe accident.
Poisoned by “the myth of absolute safety” and caught in their own trap of believing that a severe accident simply could not happen, both TEPCO and the government were negligent in terms of preparation. While both public and private-sector preparations were substandard, the ultimate responsibility for this accident lies with the national government.
- Mutual back-scratching within the nuclear power “village”
There were two types of nuclear power village with introverted organizations: a “central nuclear power village” that included industry (electric power companies and manufacturers), the bureaucracy, the politics, academia and the mass media, and “local nuclear power villages” actively seeking co-existence with nuclear power. “Everyone took hints from each other and inertia set in.”
- Responsibility under the banner of “national policy, private operation” was vague.
The formula of “national policy, private operation” whereby nuclear power policy is determined by the national government but nuclear facilities are run by private companies created uncertainty in allocating responsibility for safety regulations.
- There was excessive ad-hoc intervention on the ground by the prime minister’s office in the initial response.
Both positive and negative aspects of (then) Prime Minister Kan’s character emerged. Micromanagement from the very top, despite a lack of confidence in the bureaucracy serving under the prime minister, sparked confusion in the chain of command (and a spiral of distrust and intervention).
- Inadequate communication with the public led to a loss of public trust in the government (and TEPCO).
The vague explanations, the confusing data released, and delays in information disclosure via SPEEDI (System for Prediction of Environment Emergency Dose Information) only served to heighten anxiety and disappointment in the government’s dissemination of information. Efforts to disseminate information overseas, where people were concerned about the spread of radioactive contamination and the evacuation of residents, proved even weaker.
- Japan’s nuclear power safety regulations had been Galapagosized, left behind by global standards, and regulatory institutions were incapable of implementing them.
Nuclear power plant inspections had become mere formalities — checking only predetermined items and “not seeing the forest for the trees” — and many of those involved, despite sensing problems with vertically-segmented administration, nevertheless thought that they would accomplish nothing by speaking out themselves. Will the Nuclear Regulatory Agency to be newly created be able to make up for the shortage of personnel in the regulatory institutions?
- The advice and warnings of the international community were disregarded.
For example, the government and power companies either ignored or paid insufficient heed to advice from the US’ Nuclear Regulatory Commission (NRC) on counterterrorism measures for 9/11-like attacks (B.5.b)¹ and various warnings from the IAEA. The Nuclear and Industrial Safety Agency received the above B.5.b but perhaps did not recognize its

importance.

A list of several recommendations from the IIC report follows:

- Establish a nuclear power safety regulatory institution independent of the ministries/agencies promoting nuclear power.
Japan had long been cautioned, on repeated occasions, to segregate the regulation and promotion of nuclear power, but no moves were made to do so until after the Fukushima accident. The Nuclear and Industrial Safety Agency will be moved out of the Ministry of Economy, Trade and Industry and made an independent Nuclear Power Regulatory Commission. The Nuclear Safety Commission in the Office of the Prime Minister will also be transferred to the Nuclear Power Regulatory Commission.
- Create a full-fledged response unit to tackle severe disasters and accidents.
- Bolster the science and technology advisory functions for the prime minister.
- Review disaster-prevention plans to ensure crisis readiness on a consistent basis; back-checks and back fit are needed.
- Develop a system allowing Japan to cooperate internationally in matters of nuclear power safety, nuclear security, and nuclear non-proliferation.

IV. *Feedback on the Report*

The IIC report, as previously noted, was announced at a press conference with Japanese reporters on February 28, and a subsequent briefing was held for foreign reporters on March 1. The author attended both, and both venues were filled to capacity. Requests for private interviews continued to pour in thereafter, particularly from the foreign press, no doubt because the report was essentially the first of its kind. This demonstrates above all else the high degree of interest in this issue, both inside and outside Japan.

The following matters were among those that appear to have been of particular interest to foreign reporters in the question-and-answer sessions:

- Legal liability for this nuclear power plant accident (TEPCO, governments, Nuclear Safety Commission, etc.)
- Nuclear security
Why was B.5.b ignored?
- Has Japan taken measures to improve nuclear security since the accident?
- Why did TEPCO not agree to the IIC's interview requests?
- While the tsunami is regarded as the principal factor in this accident, did the nuclear reactor sustain any damage from the earthquake as well?
- The actions of (then) Prime Minister Kan

¹ B.5.b is a section of an NRC order issued to nuclear power companies in February 2002 to bolster nuclear power facilities' counterterrorism measures in the wake of the September 11, 2001 terrorist attacks in the US. An excerpt from this section reads "Each licensee shall develop and implement guidance and strategies intended to maintain or restore core cooling, containment, and spent fuel pool cooling capabilities under the circumstances associated with loss of large areas of the plant due to explosions or fire..."

The report was widely acclaimed, both in Japan and abroad, in the press and on TV. Since the initial print run did not meet demand from all interested parties, the report was promptly published and put on sale. About 100,000 copies have already been sold, much to the surprise and satisfaction of everyone involved in its preparation.

V. *Conclusion*

As mentioned before, this investigation was intended to ensure that such a tragedy is never repeated, and it is the IIC's hope that this report will assist in that objective. The Commission was a private-sector initiative, with inevitable shortcomings in terms of inquiry and verification powers, and it is expected that the government and the Diet will use their authority and power to conduct inquiries to complement this report. These three inquiries combined will bring us closer to the goal.

In future, the key will be to learn the lessons to be drawn domestically and internationally from the in-depth inquiries into the accident, and promptly apply the same in reviewing the safety regulations governing nuclear power. This will entail overcoming the adverse effects of inertia, mutual dependence within the "nuclear community," and vertically-segmented administration. It will also involve addressing all issues rationally and practically without being swept away by populist sentiment against nuclear power.

This latest accident has seriously undermined the nation's confidence in nuclear power, battering trust and faith in the ability of the government and electric power companies to respond to accidents. Restoring public trust will be no easy task, requiring considerable time, and transparency will be a decisive factor. Nuclear power is not viable without public confidence.

 FUKUSHIMA DAI-ICHI NUCLEAR POWER PLANT ACCIDENT

2011	Mar. 11	2:46 pm	Great East Japan Earthquake strikes
		3:27 - 3:35 pm	Tsunami strikes Dai-ichi Power Plant
		3:37 - 3:41 pm	Reactors Nos. 1-3 lose all AC power
		7:03 pm	Nuclear emergency declared
		9:23 pm	Instructions issued for evacuation within 3km radius and sheltering within 10km radius
	Mar. 12	5:44 am	Evacuation instructions extended to 10km radius
		After 7 am	Prime Minister Naoto Kan arrives at Dai-ichi Plant for inspection
		After 9 am	TEPCO begins venting operations on Reactor No. 1
		3:36 pm	Hydrogen explosion in Reactor No. 1
		5:55 pm	METI Minister Banri Kaieda orders seawater pumped into Reactor No. 1
6:25 pm		Evacuation instructions extended to 20km radius	
7:04 pm		Infusion of seawater begins in Reactor No. 1	
Mar. 14	11:01 am	Hydrogen explosion in Reactor No. 3	
Mar. 15	Around 5:30 am	Prime Minister Naoto Kan visits TEPCO head office; Government/TEPCO Integrated Response Office established	
	After 6 am	Hydrogen explosion in Reactor No. 4. Pressure drops rapidly in Reactor No. 2's pressure suppression chamber	
	11 am	Sheltering instructions extended to 20-30km radius	
Mar. 23	Around 9 pm	Nuclear Safety Commission releases first SPEEDI data	
Apr. 12		Nuclear Safety Commission and Nuclear and Industrial Safety Agency assess accident as INES Level 7	
Apr. 22		20km radius designated an evacuation zone; planned evacuation zone and emergency evacuation preparation zone also designated	
May 12		TEPCO announces core meltdown in Reactor No. 1	
Sep. 30		Emergency evacuation preparation zone terminated	
Dec. 2		TEPCO's in-house investigation committee issues interim report	
Dec. 16		Prime Minister Yoshihiko Noda declares "cold shutdown condition"	
Dec. 26		Government's investigation commission issues interim report	
2012	Feb. 27		Independent Investigation Commission (ICC) issues a report

 (Timeline as of March 25, 2012)