JSCE 2011 Great East Japan Earthquake Commemorative Symposiums

【Summary Report】

Japan Society of Civil Engineers

JSCE 2011 Great East Japan Earthquake Special Committee

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1. Summary

■ Introduction

"2011 Great East Japan Earthquake: One Year After the Quake and Future – Large-Scale Natural Disasters Mitigation, Preparedness, Response and Recovery" has been held by Japan Society of Civil Engineers (JSCE) on the University of Tokyo, Hongo campus (Yasuda Auditorium and others) on March 5 and 6 when nearly one year has passed since the Great East Japan Earthquake on March 11th, 2011. In spite of the bad weather, a great number of participants, including the general public, have attended the symposium, and the number of participants reached approximately 1,700 over the two days. In addition to six speakers from five overseas countries: Portugal, Taiwan, United States, Indonesia and New Zealand, many foreign participants including the representatives of JSCE overseas branches and international students attended. All meeting rooms were fully occupied by the participants who actively joined the discussions. In order to further distribute the contents of the lectures and the discussions to the general public, the speeches were delivered simultaneously via the internet on the first day. The Chairman and vice-chairman of the symposium reported the situation of the symposium at a press conference, and JSCE published the report "Activities, Findings and Recommendation in the one year - Great East Japan Earthquake Special Committee, Japan Society of Civil Engineers."

■ Featured Speech and Panel Discussions

The objective of the sessions held in Yasuda Auditorium on the first day was to make a comprehensive discussion with broadest possible view on the essential issues of the relations among society, technology and safety, which were brought about by the Great East Japan Earthquake and Fukushima Nuclear Crisis. In the morning session, the featured speech "Civil Engineering Beyond the Turning-Point" was delivered by Mr. KOIDE Goro (Science Journalist, Former NHK Executive Commentator), and a panel discussion "What Lessons Have We Learned from 2011 Great East Japan Earthquake" (coordinator: YAMAMOTO Takuro, JSCE President) were carried out. In the afternoon session, the two panel discussions "Questioning the Basic Stance of Facing Massive Natural Disasters" (coordinator: KOBAYASHI Kiyoshi, Professor, Kyoto University) and "Planning Effective Actions Toward Strengthening the Disaster Response Capability of the Society" (coordinator: MARUYAMA Kyuichi, Professor, Nagaoka University of Technology) were carried out.

In the special lecture "Civil Engineering Beyond the Turning-Point," Mr. KOIDE introduced the significant contribution of civil engineering to the development of human society with his own experiences, and further pointed out the need for making a change of civil engineering in the significant transformation of social environment and values including the Great East Japan Earthquake, by giving a number of examples, mentioning the deep relationship between civil engineering and society, between people and politics. In his speech, he requested to change civil engineering way of thinking "from growth first to public first," by quoting the physicist Mr. SAKATA Shoichi's words, "Given a good organization and good philosophy, a better job can be done."

In the panel discussion "What Lessons Have We Learned from 2011 Great East Japan Earthquake?" Mr. YAMAMOTO pointed out that the public confidence in technical systems and engineers might have been shaken due to the damages caused by the earthquake and nuclear crisis. Mr. OHISHI Hisakazu (President, Japan Institute of Construction Engineering) pointed out that though there was a lucky period that almost no massive disaster happened in the high growth period in the country, as Japan was

entering into a period that massive disasters tended to occur frequently, development of land and social infrastructure is strongly needed in order to be prepared for an emergency situation. Mr. FUKUOKA Shoji (Professor, Chuo University, and Chairman of Panel on Infrastructure Development, Ministry of Land, Infrastructure, Transport and Tourism) discussed how to change national social infrastructure development policies for disaster prevention and mitigation. Ms. ISHIKAWA Mikiko (Professor, The University of Tokyo) pointed out the need for having a grand design based on an “ideal image” of reconstruction of the affected areas, and Mr. YOSHINO Gentaro (Visiting Research Fellow, Japan Center for Economic Research）pointed out the issues of expertise segmentation in science and technology, and the importance of having “a sense of the common people”, and Mr. IIO Jun (Professor, National Graduate Institute for Policy Studies) pointed out the need for developing new industries suitable for the population declining, and the significance of improving literacy of the general public for the risk of disaster.

■ Plenary Session

The first session "Questioning the Basic Stance of Facing Massive Natural Disasters" discussed how to face the massive disaster which occurs at low frequency but causes massive damages. Mr. KOBAYASHI Kiyoshi served as a coordinator, and the five speakers delivered a speech, followed by a general discussion. Mr. NAKAO Masayuki (Professor, The University of Tokyo) pointed out that, based on the lessons from the earthquake, it was necessary to assume that the “unexpected” could happen, as the nuclear crisis did happen, from the standpoint of “Knowledge of Failure.” Mr. NAKAJIMA Hidetsugu (Senior Consultant, ERM Div., NKSJ Risk Management, Inc.) pointed out that it was necessary to take reasonable risk management measures against infrequent, but large-scale disasters in the future from a financial risk management perspective. Regarding this, Mr. FURUKI Moriyasu (Advisor, JSCE) stated that against this kind of risk, comprehensive countermeasures based on the concept of “disaster mitigation,” and the cooperation and self-independence of the public were indispensible. Mr. Carlos S. Oliveira (President, Portuguese Association for Earthquake Engineering) discussed the damages caused by the Lisbon Earthquake and Tsunami in 1755 and reconstruction works, which generated widespread damage in Europe. Moreover, Mr. Jenn-Chuan CHERN (Minister, Public Construction Commission, Professor, National Taiwan University) introduced the massive damage of Typhoon Morakot that struck the southern part of Taiwan in 2009, and the rapid progress of the reconstruction work after the disaster, which showed the importance of close communication with the local people and the continuity of reconstruction work. Mr. KOBAYASHI pointed out that the basis for disaster mitigation was a basic framework for a modern civil society, which was “to ensure each individual’s freedom of choice” even in an emergency situation, and this concept was developed by the European enlightenment thinkers who were inspired by the Lisbon Earthquake.

The second session "Planning Effective Actions Toward Strengthening the Anti-Disaster Capability of the Society” focused on a future direction of technology development as the backbone of civil engineering based on the experience of the Great East Japan Earthquake. The coordinator Mr. MARUYAMA Kyuichi introduced that the concrete bridges which were designed with disaster mitigation measures showed that those measures worked effectively against the Chuetsu Earthquake in 2004 and the Great East Japan Earthquake, in light of the serious damages to concrete bridges on Hanshin expressway and Sanyo Shinkansen line caused by Hanshin Awaji earthquake in 1995. He then raised a question about a direction of future technology development. Ms. Lesley Carol Ewing (California Coastal Commission, American Society of Civil Engineers) reported that many of the structures were good in structural soundness and proper reinforcement works were very effective, based on damage

assessments conducted since 2001 including the one of port facilities caused by the Great East Japan Earthquake. Furthermore, she proposed contingency planning. Mr. SAKATA Kenji (Immediate-Past President, JSCE) pointed out that it was necessary to develop structural design technologies with massive tsunami risk potential in mind and to introduce the concept of fail-safe design, and he also emphasized the importance of the consideration of residual risks. Mr. KUSAKABE Osamu (President, The Japanese Geotechnical Society) stated the need for the improvement of technologies to strengthen stability of earth structures, the disclosure of the geological information, and the accountability of the geological performance of residential land. Mr. TOHMA Junichi (Central Research Institute of Electric Power Industry) discussed the validity of the report “Evaluation Technology for Tsunami in Nuclear Power Plants” published by JSCE in 2002, and pointed out the need for further studies to improve tsunami risk estimations.

■ General Sessions

On the second day of the symposium, 12 general sessions, which were divided into three groups, were held at four different buildings, and deep discussions on specific topics were carried out. The topics of the general sessions were basically decided in accordance with the activities of “Great East Japan Earthquake Special Committee” and of committees on specific issues that were established immediately after the earthquake. In addition, rainfall disasters such as Typhoon No. 12 (81 deaths), No. 15 (18 deaths), and the Chao Phraya river flood damages in Thailand (800 deaths) last year caused huge damages. A special session on rainfall disaster was held, which was one kind of massive disasters, that have many commonality with earthquake and tsunami.

The first group consisted of 5 sessions about disaster damages and countermeasures against tsunami, soil liquefactions, and rainfall disaster.

Three sessions were directly related to tsunamis. They were “Characteristics of 2011 Great East Japan Earthquake and Tsunami, and Recovery and Reconstruction” (Coordinator: FUJIMA Koji , Professor, National Defense Academy of Japan), “Tsunami Wave Height Estimation and Tsunami Risk Reduction” (Coordinator: MARUYAMA Kyuichi, Professor, Nagaoka University of Technology), and “Civil Engineering Technologies to Contribute to Enhancement of Nuclear Safety Infrastructures” (Coordinator: TOHMA Junichi, Central Research Institute of Electric Power Industry). In addition to several speeches about the tsunami damages caused by the Great East Japan Earthquake, Mr. DIPOSAPTONO from Ministry of Marine Affairs and Fisheries of Indonesia introduced the Sumatra Earthquake and the Tsunami in 2004 and brought forward discussion topics such as the characteristics of tsunami occurrence and damage, the estimation technology for tsunami water levels, soft and hard countermeasures, especially those measures for improving the “tenacity” of coastal levees, and the urban development against the tsunamis. In addition, in the session “Civil Engineering Technologies to Contribute to Enhancement of Nuclear Safety Infrastructures,” an active discussion was made on the importance of the public risk communication in the safety assessment of Infrequent, but destructive large-scale disasters and residual risks.

In the session “Lessons Learned from the Soil Liquefaction Caused by the Earthquake” (Coordinator: TOWHATA Ikuo, the University of Tokyo), a discussion was made on the soil liquefaction caused by the Great East Japan Earthquake, emergency restoration, and future issues. In addition, the damage of the soil liquefaction caused by Christchurch (New Zealand) Earthquakes in February 2011 was introduced by Mr. CUBRINOVSKI（Professor, University of Canterbury）.

In the session “How We Should Prepare and Respond to Intensive, Torrential Rains” (Coordinator: KAWAMURA Akira, Professor, Tokyo Metropolitan University), five speakers introduced the flood in

Chao Phraya river, Thailand in the autumn of 2011, the rainfall and sediment disasters mainly in Kinki and Tokai regions caused by the Typhoon No 12. and No. 15, and actively discussed the countermeasure against these kinds of serious disasters and excessive flooding.

The second group consisted of five sessions about the recovery of the seriously damaged areas and future anti-disaster plans.

First, in the session “Recovery and Rehabilitation Plans for the Affected Areas: Present Status, Challenges and Future Vision 1” (Coordinator: KISHII Takayuki, professor, Nihon University), on the theme of how to proceed the recovery and rehabilitation of the infrastructures and urban areas in the affected regions, a discussion was made on the importance of integration of different fields, wide-area regional cooperation and “resilience” of the local community, being joined by Mr. TANG of ASCE who studied the lifeline damages caused by the 3.11 earthquake. With a theme of consensus-building in the recovery and rehabilitation activities including radioactive waste treatments, the session “Recovery and Rehabilitation Plans for the Affected Areas: Present Status, Challenges and Future Vision 2” (Coordinator: NOZAKI Hidenori, President, Oriental Consultants, Co., Ltd.) discussed the importance of enhancing consensus-building approaches, and sharing and distributing accurate and impartial information.

In the session “Regional Disaster Preparedness and Response Planning” (Coordinator: SAEKI Mitsuaki, Executive Vice President, Eight-Japan Engineering Consultants Inc.), regarding regional disaster preparedness and response planning against massive disasters, a discussion was made on PDCA cycle applying “disaster risk management plan matrix,” disaster education, cooperation among local governments. As for the session “Disaster Preparedness and Emergency Management” (Coordinator: OZAWA Kazumasa, Professor, the University of Tokyo), effective emergency management of administrative agencies was discussed, and the research findings on the methods of utilizing tsunami sediment as embankment materials were introduced.

The session “ICT Development for Disaster Resilience and Traffic Control Management” (Coordinator: YAMADA Harutoshi, Project Professor, The University of Tokyo) discussed specific disaster countermeasures such as those for prioritizing information and commutation systems, information and communication systems to issue evacuation instructions, web sites to consolidate and distribute large volume of diversified information, traffic management in the event of disaster.

The third group consisted of 2 sessions which covered contents across the fields above. The session “Networking and Collaboration to Prepare for Cataclysms” (Coordinator: HAYASHI Yoshitsugu, Professor, Nagoya University) offered a panel discussion that was carried out based on the recognition that each JSCE chapter should take active actions in order to be well prepared for the Tokai, Tonankai, Nankai earthquakes that were expected to happen.

The other session “Revitalizing the Japanese Engineering Industry with Intra-Industry Cooperation” (Coordinator: HIROSAKI Botaro, Vice President, The Japan Federation of Engineering Societies) offered a panel discussion in which representatives from the following societies participated as panelists: JSCE, The Japan Society of Mechanical Engineers, The Society of Instrument and Control Engineers, The Institute of Electronics, Information and Communication Engineers, Architectural Institute of Japan. In this session, the participants actively discussed how to promote intra-industry cooperation in the engineering industry in order to improve and ensure safety of the modern advanced engineering systems in society.

■ Closing remarks

It has been one year since the 2011 Great East Japan Earthquake. The Great East Japan Earthquake Special Committee established immediately after the earthquake has made several publications and policy recommendations. On the occasion of the one year commemoration, we held this commemorative symposium to have comprehensive and extensive discussions on our investigation outcomes and future visions. This report is a summary of the discussions in the symposium, and we would appreciate if you read it together with the report that summarized the JSCE activities undertaken during the one year -"Activities, Findings and Recommendation in the one year - the Great East Japan Earthquake Special Committee, Japan Society of Civil Engineers." In the following fiscal year, follow-up investigations, researches, and field works will be undertaken by the follow-up committee on the Great East Japan Earthquake and other committees in JSCE. Moreover, the investigation and research results on the Great East Japan Earthquake disaster will be published electronically by the Great East Japan Earthquake Research Report Editorial Committee, chaired by former JSCE president Mr. SAKATA Kenji.

Lastly, we would like to pray for all those who have lost their lives in the Great East Japan Earthquake, and express our deepest sympathy to all those who have suffered in this disaster, and on behalf of the approximately 40,000 members of JSCE, to send our heartfelt wishes to the ones trying hard for the recovery and reconstruction of the affected areas in the hardship. Moreover, we would like to express our gratitude to the young members of JSCE and secretariat who made this symposium possible.

March 2012

IEDA Hitoshi, Chair (Vice-President, JSCE, Professor, The University of Tokyo)
KAZAMA Motoki, Vice-Chair (Tohoku University)
Great East Japan Earthquake Special Committee, Symposium Executive Committee

2. Featured Speech “Civil Engineering Beyond the Turning-Point”

Presenter	KOIDE Goro (Science Journalist, Former NHK Executive Commentator)

Subject:

The Great East Japan Earthquake and Fukushima Nuclear Crisis are the third “turning point” of Japan following the Meiji Restoration and defeat in World War II. Without the restoration from this “turning point,” there is no restoration afflicted areas, or of Japan.

The most important thing at the present time is a concrete vision of the Japan’s restoration. Unfortunately, the vision remains ambiguous as the time goes by.

Not limited to the filed of civil engineering, when it comes to thinking of the future, it is important to base on the common values lying beneath the world.

A book named “Limits to Growth” became a worldwide bestseller at the early 1970s. It was a prediction of the future, responding to the warning “People could not archive richness though economic develops due to the population explosion and resource depletion” made by the Rome club formed by world’s eminent persons. As a conclusion, the change of the economy and society from “mass production, mass consumption and mass disposal” is indispensable.

There is no future without changes in the present way of the economy and society. Although such values repeated seesaw struggles, it has been the basis of the ideas such as realistic technologies, a preventive principle, biodiversity conservation, and sustainable economy.

These values have been evolving to the undercurrent of society along with the dominance of market fundamentalism which is originated from the United States and symbolized by the globalization.

The prevention of global warming can be in line with that dominance. In order to prevent global warming, enhancement of energy efficiency on technical and social levels should have been prioritized. However, Japan saw this issue as an opportunity to build additional nuclear power plants. It has been getting a sense of value like Galapagos, on the absolute authority of the slogans, “a country with few natural resources” and “enhancement of global competitiveness.”

We now see achievements of civil engineering all over Japan: bridges striding over the sea, village resettlements at dam construction sites, numerous long tunnels, railways and roads throughout the mountainous land, shifting river flow channels, levees for flood prevention, harbors and airports, revitalizing ruined environments, and others. Nothing seems impossible for civil engineers as long as we run powerful mechanical forces on oil.

Obviously, civil engineering is the infrastructure of our society. However, we could not see that a clear picture of infrastructure is beyond the “turning point”.

I am looking forward to the contribution of JSCE to the future other than to the “country-first.”

Summary

Various aspects of civil engineering got to know when I work in Sapporo

It was the time when I joined NHK and went to work in Sapporo that I first met with civil engineering. I learned that the person who can be said as the father of civil engineering in Japan had been in the Sapporo Agricultural College famous for Dr. Clark. He is Isamu Hiroi. He constructed the Otaru harbor and the first breakwater offshore in Japan with the length of 1,276 in 1908 (Meiji year 41). He then became a professor at Tokyo Imperial University, and taught a lot of civil engineers such as Akira Aoyama who involved in the construction of the Panama Canal and Yoichi Hatta who was active in Taiwan. Civil Engineering as the basic social infrastructure plays a major role in the improvement of the life quality and safety. I learned that civil engineering has the aspect of achieving the affluence.

On the other hand, I also learned from the road built in Hokkaido by the prisoners that there are also victims in the shadow of Civil Engineering.

Moreover, there is a plan of drainage channel of the Chitose river. It is to build an artificial drainage channel to flow the waters to Tomakomai as a flood countermeasure of the Chitose river near Chitose airport which is the headstream of Lake Shikotsu. I learned that civil engineering had a close relationship with society, politics, and economic as implied by the impact to the natural environment of Lake Utonai.

Given a good organization and good philosophy, better work can be done

There was a scientist named Shoichi Sakata who published the Sakata model about neutrino. He believed that the way of thinking and human value judgments were important to scientific study, and said that “Given a good organization and good philosophy, better work can be done.”

Then, there are a lot of doubts about whether today’s Japan has a good philosophy and good value judgments as the basic way of thinking. For example, a book titled “Limits to Growth” was published in 1972, and it became the worldwide bestseller. It warns that people’s living standard can not be maintained if the population continues to increase and resources drain and also calls for a change of the structure of the world.

In 1980s, especially in Europe, various ways of thinking appeared, represented by realistic technologies, sustainable economy and society, diversity conservation. On the other hand, those of Japan lost touch with the spirit of the age while deregulation and privatization were promoted in the name of globalization. It feels like that the Japanese way of thinking and value judgments are trapped in the kind of Galapagos syndrome. I hope that civil engineering can go beyond this.

Shifting of priorities from growth first to public first

I as a layman would like to show an example of the future vision of civil engineering. There is a city facility named the home of the sun located in Sakata city, Yamagata Prefecture. It is a zero energy house which makes the best use of solar energy by utilizing the feature of the concrete, and hardly use any energy from electricity, gas or oil for heating. There are already 10 houses built mainly in Sakata city and Tsuruoka city. Those houses are built with concrete and wrapped with insulating materials. In this way, I think civil engineering can consider creating shelters for disaster mitigation that use the least energy so as to minimize damages.

As for energy problems, I am seeing a future in the potential of the small hydro power facility. The

power generation of the small hydro is less than 1000kw, and the generated electricity is able to send to a community. Moreover, as decontamination of Fukushima is an urgent issue in the public's eye, I hope that civil engineers could come up with some ideas for decontamination and storage system and solve the technical problems.

Taking an example of the ongoing environmental regeneration of the Ashio Copper Mine, though the large-scale restoration works use machines, nets are pasting on some places so as not to break the rock. In the latter case, plant seeds flow into the crevices of rocks, and then grass grows. This means to let the resilience power of nature do the work, and this way leads to a better outcome. As environmental regeneration is an urgent issue in the world, the creation of this kind of environmental regenerative system should be handled in the field of civil engineering.

Finally, I would like to give an example of the creation of disaster mitigation forest by planting evergreen laurel forests. Currently, the debris is a difficult problem in the affected areas of the Great East Japan Earthquake. There were pine forests on the coast of the affected areas, but they hardly withstood the tsunami and were swept away. In contrast, evergreen laurel trees firmly rooted in the ground. Therefore, there is a plan to dig holes in the embankment, fill it with debris, and cover the debris with soil in a mountain shape, and finally create a disaster mitigation forest by planting the evergreen laurel tree instead of the pine forest. This plan is the realization of one of the missions that civil engineers work on.

Considering how to shift from growth first to public first, we can try such ingenious attempts. I would like to close my speech hoping that in the future civil engineers will be known as the major players who make a change in Japan by learning from the Great East Japan Earthquake.

3. Panel Discussion

Topic	“What Lessons Have We Learned from 2011 Great East Japan Earthquake? ”
Coordinator	YAMAMOTO Takuro (JSCE President)
Panelists	IIO Jun (Professor, National Graduate Institute for Policy Studies)
	ISHIKAWA Mikiko (Professor, The University of Tokyo)
	OHISHI Hisakazu (President, Japan Institute of Construction Engineering)
	FUKUOKA Shoji (Professor, Chuo University)
	YOSHINO Gentaro (Visiting Research Fellow, Japan Center for Economic Research)

Subject:

JSCE established a special committee for the Great East Japan Earthquake immediately after the Earthquake, and have taken various actions, including sending a team of investigators, holding reporting meetings, making urgent proposal in collaboration with other societies, and establishing a committee for particular theme for dealing with important issues. JSCE are continuing to make various efforts in collaboration with various organizations and regions for the recovery and rehabilitation until today. However, it is necessary to look back and discuss “the social safety” as the fundamental question brought about by this disaster.

Japan is one of the countries most frequently hit by severe natural disasters, and it has endeavored to national land conservation over the years. In addition, efforts such as nationwide emergency drills on National Disaster Prevention Day in September have been made to improve safety. Though “Safe and Secure Country Building” is Japan’s basic principle for national development, the Great East Japan Earthquake on March 11 has resulted in almost 20,000 victims and the nuclear crisis. The result of the survey about “Can engineer be trusted” carried out by the monthly survey of the National Institute of Science and Technology Policy shows that the percentage of answer of “almost can be trusted” have dropped from more than 85% before the earthquake to less than 50% immediately after the earthquake, revealing that strong doubts against the actions of engineers for social safety have spread among the public. Moreover, as a developed country for disaster prevention, though Japan has continued to contribute to other countries by utilizing its experiences and technology, expectations for information about Japan’s measures against this disaster and future preventions from oversees has appeared, Society safe indeed is protecting people’s life. Therefore, it is necessary to extensively discuss and take measures from both hard and soft sides by assuming every possible situation. Furthermore, in order to realize “the real safe and secure country building”, the discussion should not be limited to the efforts at hand, but extended to include the issues like politics, economies and administration, accurate public understanding of safety and security, and school education.

With the theme of “what can we learn from the Great East Japan Earthquake, and what efforts are needed,” this panel discussion is expected to discuss social safety and measures against the massive disaster that likely happen among experts in various fields.

Summary

Mr. Yamamoto

Since Japan is a country frequently hit by severe nature disasters the safe and secure country-building is the basic principle for national development. However, in the Great East Japan Earthquake, 20,000 people lost their lives, and the whole world was shaken by this devastation. National Institute of Science and Technology Policy carries out a survey monthly. In their questionnaire, there is a question of “Can engineer be trusted?” and the result shows that the percentage of the answer “almost can be trusted” have dropped from over 85% before the earthquake to below 50% immediately after the earthquake. We civil engineers should sincerely accept this result and consider how to rebuild safety systems in a much stronger way. We have two topics in this panel discussion: how to deal with the issues identified through the experience of this earthquake, and what specific actions we have to take to deal with these issues. I would like to listen to the panelists.

The missing grand design

Ms. Ishikawa

I would like to raise three issues: supporting systems, grand designs, and recovery toward a sustainable society.

The Sichuan Earthquake occurred in May 2008, which caused 85,000 casualties and the areas have almost recovered in three years. The main reason is the pairing support, that is each prefecture or city in the whole country has designated a specific affected area as supporting target for providing human, capital and materials support. JSCE should get down to the parallel cooperation as a social system in preparing for the Tokai and Tonankai Earthquakes.

Next is the grand design. This is an ideal planning for a regional social infrastructure based on a long-term vision. Progress can not be made without a goal. However, as for the Great East Japan Earthquake, the grand design is totally missing.

Finally, we should confirm whether the recovery is toward a sustainable society. As one year has passed since the earthquake, we have to sincerely ask this question. The aging ratio of the local autonomies in the affected areas reaches from 30 to 50%. Local governments have already realized the aging problem, but most of the measures are the transition of the residential zones to the high places. It is doubtful whether this can be a sustainable recovery that will last 10 to 20 years. Moreover, what I want JSCE people to think most is the issue of double embankments. The basic principle of the recovery plan of all areas of alluvial plain is disaster mitigations and multiple defenses, considering the double embankment as a premise. However, the concept of double embankment is incongruous. I think the insight of the engineer is facing a challenge.

The lessons from the 3.11 Earthquake and the Nuclear Crisis

Mr. Yoshino

In the civil engineering field, there is a fatal defect, which is the lack of the public perspective. This is clearly presented in the 3.11. Among all these issues, I would like to focus on the nuclear crisis.

The tragedy is caused by technology. The thing that is supposed to the tool for realizing human happiness. How to understand this? Indeed, it is caused by the lack of the public perspective, or a grand design. This is a huge problem brought by specialization and segmentation in science and technology.

In order to overcome this, what we could do is to humbly rethink how we could really achieve new

way of richness, happiness and safety now.

We have forgotten the existence of emergency

Mr. Ohishi

We have experienced a lot of natural disasters. However, we might have forgotten the existence of them since there is a blank period of severe disasters recently. We have experiences many disaster-concentrated periods. However, we haven't experienced any natural disaster with more than 1000 casualties in the 36 years from the Ise-bay typhoon in 1959 (Showa 34) to Hanshin-Awaji earthquake in 1995 (Heisei 7). In this period, the high economic growth was achieved. It can be said that the rapid economic growth was achieved because there was no massive disaster. We have forgotten how lucky we were. However, now we have to be prepared for the Tokyo Metropolitan Earthquake, or Tokai, Tonankai, Nankai earthquakes

For example, as for road, the connection of Tokyo and Aomori, up to Koriyama there is considerable redundancy, however, network has not been formed in the north of Koriyama. If a road network with the length of 14,000km is fully constructed, Tokyo and Aomori will become connected with 14,240 roads by building an extension by 25% of the current network. Since the high economic growth period, we have forgotten the existence of emergency, and only have pursued economic rationality as at normal times. Now it is time for us to seek for the national planning that has specific image and effective measures.

New direction for social infrastructure development

Mr. Fukuoka

The Great East Japan Earthquake occurred just in the time when the discussion on the review of the Priority Plan for Social Infrastructure Development was carried out. The Minister of Land, Infrastructure, Transport and Tourism requested the planning committee to develop a basic concept of regional and urban development for tsunami prevention. Its basic direction is that the most important thing is to protect human life at any cost in a low-frequency massive tsunami like this case, and we should discuss how to place it as a plan act. To do that, it is necessary to examine the disaster prevention and mitigation system from a "multi-defense" system that includes comprehensive measures in which hard and soft measures are combined. Moreover, in order to build up an anti-tsunami national land structure, it is necessary to maintain the institutions that are helpful for the anti-tsunami urban development in the whole country. We need to develop the regional and urban development plan that combines line defense, surface defense, land use regulations, and evacuation actions

Therefore, we should not make a unified regulation, but have to discuss a system for the regeneration and revitalization of the region in consideration of the coexistence with tsunami risks in the region in response to the land use. From all these considerations, Regional Development for Tsunami Prevention Act was enacted. This act shows a desirable image for social infrastructure development, and the criteria of selection and concentration as a priority objective in the planning period.

The regional development for tsunami prevention is the outcome of the cooperation among the stakeholders in the Ministry of Land, Infrastructure, Transport and Tourism, and could be said as a grand design of the "policy change" of social infrastructure development.

The need for public literacy for recovery

Mr. Iio

The earthquake this time has four characteristics. First, the massive tsunami that we have never experienced before attacked. Second, there is a wide range of variations in the affected areas. Third, an nuclear accident occurred and has been continuing. Fourth, the aging population in the affected areas which industrial base is weakened, and makes it impossible to live in the same way even if the city is recovered to the original.

In response to these four characteristics, there are four policies for recovery. The first one is to change the idea from disaster prevention to disaster mitigation. We have to change our way of thinking since no matter how much disaster prevention is developed, the disaster which may exceed it will possibly occur. The second one is that recovery should be taken a lead by local autonomies due to the variety of the affected areas. The third one is that it is necessary for not only the experts but also the general public to participate in finding solutions for the crisis, since the nuclear crisis is not limited to the affected areas, but becomes a political problem. The forth one is that creating new industries suitable for declining population is needed.

It is not in the situation that if any places recover, other places can be recovered by the same way. However, it is indispensible for people in the region or even the whole nation to learn from the recovery process, and to have a certain level of literacy and know-how of recovery.

In order to be prepared for the next disaster and to make a grand design, technical innovations and the improvement of the public awareness become necessary.

Break the sectionalism for solving the problem

Mr. Yamamoto

Disaster mitigation requires not only the institution, but also the understanding of the general public. In addition, it could not be reasonable to implement a uniform plan made by the national government under the circumstance that various problems occurred in every single affected area. Are there any additional comments about the issue of the national and local autonomies?

Ms. Ishikawa

The most peculiar characteristic at this time is the point that the recovery plans were made by the local autonomies, under the policy of the decentralization of authority. However, each place gets very different, thus it is necessary to re-evaluate this system. So far we have hardly heard the voice from the local, now it is important that the national and local autonomies should communicate as equal partners for the same goal.

Mr. Yamamoto

I believe everyone feel that the speed of the recovery and rehabilitation in the one year is too slow. How do we think of the political issues?

Mr. Iio

It is disappointing that speedy responses could not be taken partly due to the political confusion. I think it would be beneficial if a drastic discussion on the direction for the recovery could be made. However, the good thing is that we could skirt the concern that the recovery works might be carried out right away in the conventional way if the politicians do their jobs too steadily. What I am deeply concerned about is that people tend to save the discussions considering that there is no point in discussing. It is very necessary to make discussions thoroughly. I think this one year is the key of the

full-scale recovery that we should pay much attentions to.

Mr. Yamamoto

As it is said that the Japanese way of thinking is out of touch with the popular sentiment from the view of the world, recently Japanese seems to stop thinking and do everything follow manuals. Does this lead to the Japanese way of thinking that mentioned by Mr. Ohishi?

Mr. Ohishi

Roads do not have only one single value. Besides the value of handling large traffic volume, much more values can be gained if it is properly connected. Giving a recent example, the Sendai East Road served itself as an embankment. I think we should pursue the various values of the social infrastructure, and also hope that the idea of emergency response could be reflected to it.

Mr. Fukuoka

Protecting human life is the major contribution of social infrastructure to society in event of massive disasters as the earthquake this time. However, in the discussion process, there are two extreme discussions whether constructing a huge anti-tsunami embankment or solving only with the soft side measure such as the land use regulation including the consideration of evacuation. However, single polar approach is far from enough, and the approach that includes the both sides is necessary. Therefore, it is important for the administration to change their attitudes from vertical sectionalism to horizontal connection for the effective progress of the work.

Ms. Ishikawa

In short, taking the problem solving approach, any problem can be solved if the adult society, experts and authorities take their own responsibilities to solve the problem as the project matter without sectional structure among them. However, this has not been achieved yet

Each one should take the responsibility and have a sense of humble

Mr. Yamamoto

Mr. Yoshino, you have been to many areas affected by the nuclear crisis. What do you think we should do to overcome the challenges of the recovery?

Mr. Yoshino

The big problem is that no one knows the whole picture of the crisis in Japan. For example, speaking of the nuclear power plant, the accident happened at the joint between the tubes. One tube is managed by Company A, and the other tube is managed by Company B, but in between, no one manages it and takes the responsibility. This is a symbolized example of the whole Japan. Everything is vertically separated, and no one take charge of the overall management of the nuclear power plant. This is not just a horrible story. The treatment of the contaminated wastes seeping from groundwater is the field of civil engineering. However, the world in the building of the nuclear reactor is the field of architecture regulated by the Building Standard Law, which civil engineers could do nothing. This is also exactly the sectionalism. Everything is like that. So, how should we do? One answer is the sense of responsibility as well as the sense of humble behind it. It is the self responsibility and sense of humble toward the reality that the crisis at hand triggered the misfortune of people. I think there would be no breakthrough of the present situation if each individual, each party involved could not have the sense of responsibility and humble.

Mr. Yamamoto

This is the question about the reaction of the international society. Now the world is putting their eyes on how we disseminate messages to the world.

Mr. Iio

We have to show our confidence in the recovery from this earthquake to the world. In terms of the recovery led by the local people, there might be both the successful communities as well as the failed communities. It can not be helped because this is a challenge that we have to take. The successful community can be learned by the other regions and contribute to the development of policies and technology, and further should be disseminated to the world. The important thing at that time is that the problems like changes in the industrial base and society caused by the aging population, or overconcentration, are not just the problems of Japan, but would be the problems that Asian countries would experience in the future. These are the issues we should think together with other countries especially Asian countries. Therefore, it is not that we just send the world our results, but is desirable to disseminate naturally through the participation of the foreign people in seeking the answer together.

Mr. Yamamoto

It is time to close the discussion. We covered a wide rage of issues in the discussions. Thanks very much for your participation.

4. Plenary Session

（1）“Questioning the Basic Stance of Facing Massive Natural Disasters”

Coordinator	KOBAYASHI Kiyoshi (Professor, Kyoto University)
Panelists	NAKAO Masayuki (Professor, The University of Tokyo)
	NAKAJIMA Hidetsugu (Senior Consultant, ERM Div. NKSJ Risk Management, Inc.)
	FURUKI Moriyasu (Advisor, JSCE)
	Carlos S. OLIVEIRA (President, Portuguese Association for Earthquake Engineering)
	Jenn-Chuan CHERN (Minister, Public Construction Commission, Executive Yuan)

Subject:

On March 23, 2011, Japan Society of Civil Engineers, The Japanese Geotechnical Society, The City Planning Institute of Japan, issued an emergency statement in the names of the chairmen. “When we use the word “unexpected” as experts, we should not make excuses and defend ourselves. When facing a massive earthquake, we should reaffirm the importance of taking measures in the combination of hard and soft sides with the sense of fear to the threat of nature as our predecessors.” This shows that as the advancement of the science and technology, it is possible to confront the threat of nature, and the confidence and determination of protecting human society from the natural disaster by using the hard and soft technologies.

For any action of design or plan, no matter how many scenarios are thought, unexpected things might happen. In addition, the disaster that couldn’t be assumed is possible to happen in the future. We do not always have sufficient knowledge about “what risks we are facing.” There is a barrier hard to overcome between “the things that might happen in the future” and “the things we know.” Moreover, as Mr. Nakao points out, it is necessary to assume that unexpected things may occur. The risk management of the traditional engineering takes the stance that rationally manages the risks within the assumed range by excluding the range that the possibility of exceeding is ignorable from the consideration. However, from the experience of the Great East Japan Earthquake, as Mr. Nakajima points out, the need for risk management against low frequency but large-scale disasters has been recognized once again.

Learning from the experiences of the Great East Japan Earthquake, we realize that hardware-side measures such as breakwater and embankment are not able to fully prevent the damage of large-scale earthquakes. With regard to the large-scale earthquakes which may occur once in a thousand years or not, as Mr. Furuki pointed out, since there is a limit to disaster prevention ideas for preventing the occurrence of disasters, we have to rely on disaster prevention ideas of mitigating and minimizing the risks of damages. Moreover, Mr. Oliveira points out that 1755Lisbon Earthquake brought a great impact on the European society. This earthquake caused 60,000 deaths including 10,000 deaths caused by tsunami. It is well-known that the devastation strongly influenced the European enlightened thinkers and born the foundation of the modern civil society. It is premised on the functioning of the social system that based on the individual’s rational choice with the maximum respect to the dignity and freedom of the individual. It sticks to the ontology of modern society, that is “to ensure the minimum free choice,” even in a crisis situation. This is also a thought of disaster mitigation.

The thought of disaster mitigation is based on the idea of multiple-defense by establishing a disaster mitigation system on the outside of the disaster prevention system. Disaster prevention and mitigation are not different things but a complex system that is complemented by each other. Therefore, the cooperation among the people that is supported by the social capital of trust is expected. I hope the cooperation among the people that respect the mutual help is not a temporary thing, but leads to the rehabilitation of the affected areas and the regional development.

Summary

We have learned from the experiences of the Great East Japan Earthquake that only the hard side measures such as the breakwater and embankment could not fully prevent the damage of large-scale tsunami. In addition, we've learned from the nuclear crisis the importance of the elaborate preparedness for various disasters and accidents in advance in designing and planning.

From the standpoint of risk management against the nuclear crisis, Mr. Nakao emphasized the important of assuming that the unexpected things might happen, and stressed that it was possible to do that.

Mr. Chern gave a speech including various suggestions related to the rapid recovery, from his own experiences of leading the recovery process of Typhoon Marakot that had struck Taiwan. There were a lot of common characteristics of damages between those caused by Typhoon Marakot and those by the Great East Japan Earthquake in terms of a wide range of affected areas and the huge scale of damage. He also introduced a recovery plan for an ethnic minority community in mountainous areas.

Mr. Oliveira introduced the findings of a detailed investigation on the tsunami damage and recovery process from the 1755 Lisbon Earthquake. It is well-known that the devastation strongly influenced the European Enlightenment thinkers and created the foundation of the modern civil society.

The traditional engineering risk management embrace the stance that the range of risk is set in advance and the risks is managed rationally within the assumed range. However, as Mr. Nakajima pointed out, we have recognized the necessity of the risk management for the low frequency but large-scale risk through the experiences of the Great East Japan Earthquake,.

As Mr. Furuki pointed out, since there is a limit to disaster prevention ideas to prevent the occurrence of disasters with regard to large-scale earthquakes which may occur once in a thousand years, we have to rely on disaster mitigation ideas minimize potential disaster damages and risks. The concept of disaster mitigation is based on the idea of multiple defense systems by building a disaster mitigation system besides a disaster prevention system.

The plenary session ended with the realization of the importance of functionalizing the multiple systems of disaster prevention and disaster mitigation in order to deal with massive disasters.

（2）“Planning Effective Actions Toward Strengthening the Anti-Disaster Capability of the Society”

Coordinator	MARUYAMA Kyuichi (Professor, Nagaoka University of Technology)
Panelists	KUSAKABE Osamu (President, The Japanese Geotechnical Society)
	SAKATA Kenji (Immediate-Past President, JSCE)
	TOHMA Junichi (Manager, Central Research Institute of Electric Power Industry)
	Lesley Carol Ewing (Senior Coastal Engineer, California Coastal Commission)

Subject:

It has been one year since the massive earthquake and tsunami hit eastern Japan. Immediately after the disaster, the emergency measures taken by governmental organizations such as Ministry of Land, Infrastructure, Transport and Tourism (MLIT), Self-Defense Force (SDF), Fire and Disaster Management Agency (FDMA), and National Police Agency (NPA), and the dedications of numerous volunteers who rushed to help the people suffered by the disaster, shows the fundamental strengths of Japan. However, progress in recovery and rehabilitation is not so satisfactory, due to widely tsunami –affected areas, and the meltdown of nuclear power plants which are an unprecedented experience in the society.

The objectives of this session are to discuss the specific technologies that are necessary to build a disaster-resistant society, the current situation of their development level, and the future tasks. The outcome is expected not only to contribute to the recovery and rehabilitation of the affected eastern Japan areas, but also to provide information to the areas which might be hit by large-scale earthquakes such as Tokai, Tonankai, and Nankai earthquakes.

The damages caused by earthquake motion in epicentral areas were significantly serious by the Great Hanshin Earthquake, which hit the Hanshin area 17 years ago (January 1995). Collapsed wooden houses and fires resulted in over 6,400 casualties. In addition, RC structures which boasted the world’s best anti-seismic technology collapsed, which is also said as the collapse of Japan’s “safety myth.”

Learning from this disaster, concrete structure engineers have made great efforts to elucidate the seismic performance, improve seismic design method, and develop seismic strengthening technologies for the existing structures. The efforts advanced seismic technology and measures and they worked effectively in responding to the Great East Japan Earthquake and others. Mr. Sakata, as a concrete engineering expert, talks about the details of the background and the future tasks.

While a large number of casualties caused by the tsunami have been reported widely, in terms of the loss of personal properties, houses were severely damaged or destroyed by liquefactions and landslides. The liquefaction of the ground was firstly noticed in Niigata earthquake that occurred in June 1964. The inclined RC-built apartments were a typical housing damage.

After the Great Hanshin Earthquake in 1995, seismic strengthening technology has been developed for earth structures like roads and railway embankments. Mr. Kusakabe talks about the details of seismic strengthening of ground, the technical challenges and future tasks about liquefaction phenomena in wide areas.

In regard to the nuclear power plant accident, it used to be misunderstood that Japan Society of Civil Engineers (JSCE) happened to be asked for the responsibility for inappropriate estimations of tsunami heights. JSCE cleared up that misunderstanding by presenting the fact that the construction of nuclear power plant was built over 40 years ago and that JSCE published tsunami calculation methods in 2002.

Simulation technology for tsunami propagation is achieving a high level with the advancement of numerical calculation technology. However, since the tsunami height is greatly affected by the scale of the collapsed seabed where the earthquake occurs, the accuracy of the assumed height in a certain region depends on how to use the earthquake prediction model. In this regard, Mr. Tohma talks about the transition of the technology, the current situation as well as the future challenges.

The last speaker is Ms. Ewing of ASCE, a coastal engineer. She discusses earthquake and tsunami effects to the coastal structures and points out structural issues regarding abutment protection, scour, inundation, green belts, and future designs of coastal protection structures. She undertook the studies of the Great Japan Earthquake effects with ASCE and Port and Airport Research Institute teams soon after the disaster.

Summary

Mr. Sakata explained the effectiveness of the concrete technology against this earthquake and tsunami, particularly the contents summarized in the Standard Specification for Concrete Structures, from the investigation of the damage of the concrete structures. He pointed out the technologies related to anti-seismic design and anti-seismic reinforce was proved to be very effective while the technological development against massive tsunamis was still insufficient, which was an important issue for future studies He pointed out that countermeasures against severe accidents, an introduction of a fail-safe design concept, and the consideration of residual risks were important.

Mr. Kusakabe focused on the important issues in geotechnical engineering and talked in details about the damage of soil liquefaction, the damages and recovery of the residential zones built on the reclaimed lands and the damages and recovery from the massive tsunami. He further mentioned the specific actions such as the disclosure of the stability improvement technologies of earth structure constructed under the old standard and the geological information as well as accountability of the performance of residential land. Last, he proposed to develop an index of national land safety against natural disasters in order to make a change of the public values by taking this disaster as a learning opportunity.

Mr. Tohma introduced the efforts and measures against tsunamis in Japan from a historical perspective, and explained the main contents of the “Assessment Technology of Nuclear Power Plants Against Tsunami” published by JSCE in 2002. He also elaborated the lessons learned from this disaster, including the systemization of the technologies for the estimation of tsunami water level by flexibly incorporating new knowledge, promotion of the understanding on the variation of the estimation results, strengthening the integrated system over divisions for taking comprehensive measures, as well as the new emerging technical issues.

Ms. Ewing introduced 8 cases of disaster investigation by ASCE since 2001, and stated that the investigation report is reflected in the standards and design manuals. Regarding this disaster investigation, she presented the details of the investigation on the damages of the coastal and port facilities from Aomori Prefecture to the north part of Fukushima Prefecture, which is carried out cooperatively with Port and Airport Research Institute on May 12th to 26th, 2011. She mentioned that most of the structures are good in structural soundness and the proper reinforcement works are very effective, and she further emphasized the importance of the Contingency Planning.

5. **Parallel Session**

1) “Characteristics of 2011 Great East Japan Earthquake and Tsunami Disaster, and Recovery and Reconstruction” Organizer: Tsunami Disaster Management Committee	
Subject	Since most of the damage of the Great East Japan Earthquake is caused by tsunami, the understanding and the countermeasures against the tsunami is indispensable for the rehabilitation from the disaster. Indeed, what are the characteristics of that tsunami? How is the damage occurred? What can civil engineers do to reduce the damage? What should be the desirable urban development? In addition, how is the progress of recovery and rehabilitation one year after the disaster? Experts from the field of civil engineering, as well as seismology and geology will make reports on the latest findings. In this session, we will have Dr. DIPOSAPTONO from Indonesia to share their experiences. Indonesia has suffered from the Indian Ocean Tsunami, which is the similar disaster to the Great East Japan Earthquake. We hope his speech could help to clarify the characteristics of Japan’s countermeasure.
Coordinator	FUJIMA Koji (Professor, Dept. of Civil and Environmental Engineering, National Defense Academy of Japan)
Presenters	Subandono DIPOSAPTONO (Ministry of Marine Affairs and Fisheries, Indonesia: “Recent Progress on Tsunami Disaster Management in Indonesia ”
	YAGI Yuji (Associate Professor, Tsukuba University) “2011 Great East Japan Earthquake: Source Process Analyses”
	GOTO Kazuhisa (Senior Researcher, Planetary Exploration Research Center): “2011 Great East Japan Earthquake-Tsunami Effects Investigations and Damage Assessments”
	SUWA Yoshio (Senior Researcher, National Institute for Land and Infrastructure Management): “Building Tsunami-Resilient Coastal Levees and Coastal Facilities”
	YAGI Hiroshi (Fisheries Infrastructure Group Head, National Research Institute of Fisheries Engineering) : “Damages to the Fishing Industry in Tohoku”
	KOSHINUMA Shunichi (Associate Professor Tohoku University Disaster Control Research Center): “Aiming at Reconstructing the Afflicted Areas and Building Disaster Resistant and Resilient Communities”

Summary

Mr. Diposaptono said that same as Japan, Indonesia was a country that was threatened by earthquakes and tsunamis and introduced that tsunami countermeasures were carried out in the combination of several measures such as land use plans, evacuation drills, the development of early warning systems, planting mangroves, and construction of embankment. He further emphasized that in order to carry out these measures, regional cultures had to be respected.

Mr. Yagi presented the detailed analysis of the seismic source of the Great East Japan Earthquake. He elaborated that the main reason for the tsunami was that the slip near the trench accelerated rapidly and continued slipping for 90 seconds and reached 50m at a maximum.

Mr. Goto presented the latest investigation results of the Great East Japan Earthquake and pointed out the importance and difficulties of sediment investigations by giving the example of the sediment caused by the Jogan Earthquake and Tsunami in 869.

Mr. Suwa (on behalf of Mr. Kato Fuminori) explained the cases of coastal levees damage, and its mechanisms, and pointed out the need for tenacious structures. He further explained hydraulic experiments and their developments.

Mr. Yagi introduced the damages to fishery and pointed out that even only to breakwaters there were various damages. The mooring facilities were also affected by the soil liquefaction caused by the earthquake and spill of backfill caused by the backwash.

Mr. Koshimura introduced the efforts to recover and develop a tsunami-resilient city. He also pointed out the issues of the past relocation to high places/grounds, and emphasized the importance of keeping the memory of disaster and recognition of the limits of science and technology.

There were many comments from the audience such as that high-rise residential house should be recommended; though it was necessary to consider uncertainties in forecasting maximum possible tsunami, deterministic forecasting technology should be improved.

2)“Tsunami Wave Height Estimation and Tsunami Risk Reduction”
Organizer: Tsunami Damage Estimation and Risk Reduction Committee

Subject	The characteristics of the Great East Japan Earthquake are that the huge damages in the coastal areas in east Japan is caused by the tsunami resulted from the large-scale Subduction-zone earthquake. In this disaster, the nuclear crisis with unprecedented meltdown occurred, which is caused by the lost of AC power resulted from the earthquake, and the lost of emergency power resulted from the tsunami that crossed the seawall and breakwater. Because of this nuclear crisis, the estimation technologies for the tsunami water level summarized by JSCE in 2002 partially saw as problematic. Therefore, in this session, in order to properly promote the understanding of the estimation technologies summarized by JSCE, in addition to giving an explanation on these technologies by the keynote speech, we will further have discussion from the perspectives of structure, urban development, information technology, BCP, on the issues that what kinds of measures are possible to mitigate the damage when the massive disaster like Tsunami occurs. We hope this session can contribute to the recovery of the affected areas, or the development of the disaster prevention plan in the regions that Tsunami is expected to happen in the near future.
Coordinator	MARUYAMA Kyuichi (Professor, Nagaoka University of Technology)
Presenters	TOMA Junichi (Central Research Institute of Electric Power Industry): “Methods for Estimating Tsunami Forces”
Panelists	The above 2 persons plus:
	MASE Hajime (Professor, Disaster Prevention Research Institute, Kyoto University)
	KONAGAI Kazuo (Professor, Institute of Industrial Science, the University of Tokyo)
	YAMADA Tadashi (Professor, Chuo University)
	HATO Eiji (Professor, The University of Tokyo)
	TAKAHASHI Tomoyuki (Professor, Kansai University)
	FURUKI Moriyasu (Advisor, The Japan Society of Civil Engineers)

Summary

In this session, as a keynote speech, Mr. Thoma explained the present situation and issues of estimation methods for tsunami water levels. The general method of the tsunami propagation simulation is to set the tsunami source (Fault Model) and numerically solve the Nonlinear Long Wave Theory Model. However, since the identification of tsunami sources is full of uncertainties, it is difficult to improve the accuracy of the estimation of tsunami water levels.

After the keynote speech, 6 panelists discussed the disaster mitigation issued from various aspects. Mr. Furuki emphasized the importance of the integration of the ideas from 3 parties (designers, business and administrative persons, citizens) in establishing social safety and further introduced the general concept diagram of tsunami scales with the maintenance of functions (society, organizations, structures). Next, Mr. Yamade and Mr. Mase talked about the maximum flood water level, the probability of simultaneous occurrence of flood, high-tide, and tsunami, and further pointed out the importance of the preparedness for accidents beyond imagination. Mr. Takahashi stated that in order to improve the accuracy of tsunami information, the advancement of simulation technology and its integration with the GPS observation data was necessary, and there was a need for the accurate and rapid consolidation of the information of damage situation in every affected area in order to carry out rescue activities. Mr. Hato pointed out that the problem of the public debate of local autonomies in determining the embankment height was that a large gap in time-scale existed between hard side and soft side and between administration and the public. Last, Mr. Konagai presented that in the transmission of information, the content of information would chang if the number of the intermediary increased in both spatially and temporally (historically).

3）“Civil Engineering Technologies to Contribute to Enhancement of Nuclear Safety Infrastructures: Earthquake and Tsunami Disaster Risk Reduction“ Organizer: Civil Engineering Technology for Nuclear Safety Committee	
Subject	The tsunami disaster of the nuclear power plant caused by the Great East Japan Earthquake prompted the doubt on the safety security of nuclear power plants against massive earthquake and tsunami. Since nuclear power plant is a complex system, the comprehensive efforts made by the expertise from various fields is necessary, in order to reduce the risk caused by natural disasters. In particular, civil engineering is strongly related to the handlings of nature disasters such as earthquake and tsunami. The seismic design guideline of nuclear power plants is now re-evaluated, and the current trend is to set the design standard to be resistant to earthquake ground motion and tsunami comparable to those of the Great East Japan Earthquake. In consideration of the situation, prediction of design load, countermeasures against the disasters beyond the prediction, and roles and contribution of civil engineering on the recovery from disasters will be discussed together with the experts of reactor engineering.
Coordinator	THOMA Junichi (Central Research Institute of Electric Power Industry)
Presenters	YAMAGUCHI Akira (Professor, Osaka University): “Safety Operation and Protection Systems = Disaster Risk Reductions”
	NAKAMURA Susumu (Professor, Nihon University): “From a Seismic Safety Viewpoint”
	MATSUYAMA Masafumi (Central Research Institute of Electric Power Industry): “From a Tsunami Safety Viewpoint”
Panelists:	The above 4 persons plus:
	TAKAHASHI Tomoyuki (Professor, Kansai University)
	SHOJI Gaku (Associate Professor, Tsukuba University)

Summary

[Speech]

[System Safety= Risk Reduction]: The basis of nuclear safety against external factors is to get rid of hazards and to reduce risks. The nuclear safety should be constantly enhanced by learning from home and abroad at normal times and aiming at finding out the vulnerability on the system.

[From the Perspective of Earthquake Safety]: It is required to develop a design system that the limits of functions would not lead to the failure of the system structure, and support the public safety against earthquakes by taking effective countermeasures against the disasters combined with earthquake and nuclear crisis.

[From the Perspective of Tsunami Safety]: Ensuring the safety of nuclear power plants against tsunamis in the future requires the countermeasures from the both sides of design criteria against tsunami and accident management. Therefore, efforts should be made on technical issues such as the verification method for the development of criteria tsunami, evaluation on the tsunami inundation and tsunami fluid power.

[Panel Discussion]

Dealing with the tsunami that exceeds the design standard: It is important to accurately grasp the tsunami information. In order to do this, it is necessary to establish a multiple information collection system such Tsunami Warning, Ocean Radar, GPS Wave Recorder, as well as a system to utilize these information.

The understanding and application of the risk assessment by probability theory: To cope with risk of extremely small probability of occurrence by probability theory, it is better to make a safety assessment according to the stress test with margin of safety. Moreover, it will be good to consider the scenario that exceeds the limit stage of the facility (for example, the impact of the landslide nearby). The risk assessment by probability theory is able to apply to the assessment of the variation of the hazard force obtained by determinism.

Residual risk and crisis management: The risk that the deepest layer breaks even though deep protection still remains (Residual risk). Emergency countermeasures should be taken against the residual risk. The nuclear safety should not be discussed from the dichotomy of safe and unsafe.

The cooperation in the filed of the nuclear power plant: Efforts should be made on the tasks, such as dispatching information to other academic societies, cooperation to the revision of guidelines, working-level

communication, sharing of the concepts of nuclear safety with other fields, cooperation with disaster prevention field, providing the hazard information with the awareness of application in the plant field.

4）“Lessons Learned from the Soil Liquefaction Caused by the Earthquake”
Organizer: Soil Liquefaction Committee

Subject	The Great East Japan Earthquake has caused the soil liquefaction in many areas, and serious damages in urban facilities such as residential houses, roads, lifelines, and industrial facilities such as harbors, and river embankments. The range of the damage area is not just within Tohoku area, but wildly distributed in Kanto region including Tokyo bay and along the Tone river. In particular, the urban area of Tokyo bay is built on the relatively new reclaimed land after WII, and it became the life infrastructure of large population. The soil liquefaction in this kind of area brings not only the technical issue in geotechnical engineering, but the issue of urban management in how to recover and how to take anti-seismic countermeasure in the future while maintaining the function of the metropolis and the civil of the public. In this session, we will have speech on the damage situation, impact on the public, administrative response and the future countermeasures of Urayasu city which is particularly severely damaged in Kanto region. Moreover, Christchurch Earthquake in New Zealand that occurred repeatedly during the years 2010 to 2011 also resulted in serious damage to the city. A researcher from New Zealand is also invited to make a speech on the damage of this earthquake.
Coordinator	TOWHATA Ikuo (Professor, The University of Tokyo)
Presenters	ISHII Ichiro (Deputy Mayor of Urayasu City)
	Misko CUBRINOVSKI（Professor, University of Canterbury）: “Liquefaction Impacts on Buildings and Infrastructure in the 2010-2011 Christchurch (New Zealand) Earthquakes”

Summary

Mr. Cubrinovski presented that several earthquakes repeatedly happened in New Zealand during the years 2010 to 2011. This series of earthquakes occurred along the rift extending from east to west on the east coast of South Island, and among them the earthquake that resulted in particularly serious damages was Darfield Earthquake occurred on September 4th, 2010, and Christchurch Earthquake occurred on February 22nd, 2011. After that, the earthquakes of Mw = 5.3 ~ 6.0 occurred in June and December 2011. Christchurch Earthquake caused damages to buildings and foundations of over 10000 residential houses. In addition, the phenomenon of house subsidence caused by reoccurred soil liquefaction due to the repeated earthquake was identified in the same place. The high-rise buildings in central business district were also damaged, and the disaster greatly affected on economical activities. Moreover, he showed the water pipes damages in a wide area, and damages to residential areas and bridges caused by lateral flow.

Mr. Ishii presented the damage situations and recovery plan in Urayasu city.

The Urayasu city is a region that greatly expanded by land reclamation conducted in nearly 15 years during the period of high economic growth of Japan. It has residential areas accommodated for 160 thousand populations, business and industrial areas represented by Tokyo Disneyland and steel complex. The earthquake and its aftershocks have resulted in the occurrence of the soil liquefaction phenomenon in almost the whole area of the reclamation land reclaimed by dredging pump. This brought the damages such as large amount of sediment eruption, subsidence and declination of detached houses, destruction of the sewerage system. The emergency restoration work of the seriously damaged sewerage system completed with the support of the neighborhood institutions in one month. In addition, the soil liquefaction occurred mainly in land reclamation sand layer, and the thicker the layer that contained many fine-grain fractions for reclamation was, and the shallower groundwater level was, the larger the damages of buildings would occur. The city has made plans on the prevention of the soil liquefaction of the public facilities such as road and sewerage systems in order to build a disaster-resistant city which is the basis of the recovery. This plan is considered to be mainly implemented on important routes and trunk lines from the disaster mitigation concept that minimized the enlargement of damage. Moreover, he also pointed out the need for technical development of economic liquefaction countermeasures that could be applied to small buildings such as existing detached houses.

5)“How We Should Prepare and Respond to Intensive, Torrential Rains” Organizer: Committee on Hydroscience and Hydraulic Engineering	
Subject	The year 2011 is not only the year that the Great East Japan Earthquake happened, but also a year that rainfall disasters frequently occurred. In recent years, due to the impact of heat island phenomenon and global warming, the rainfall of over 100mm precipitation per hour becomes common in Japan, and rainfall disasters even coupled with frequently occurred guerilla heavy rainfall happens annually like everyday affair. In this session, we will mainly focus on the specific rainfall disasters, which are Chao Phraya River flood in Thailand, large-scale landslide disaster especially in Kii peninsula caused by Typhoon No. 12 in Japan, and rainfall disaster that struck Nagoya and Tokyo metropolitan area caused by Typhoon No. 15. We will take a look of the whole picture of the rainfall disaster, and discuss the ways to enhance the overall “Disaster Prevention, Mitigation, and Resilience” against the intensified rainfall disasters, and further propose a guideline for how to face the intensified rainfall disaster in the future.
Coordinator	KAWAMURA Akira (Professor, Tokyo Metropolitan University)
Presenters	SAYAMA Takahiro (Researcher, Public Works Research Institute): “2011 Thailand Floods Spread Down Chao Phraya River”
	TAKABAYASHI Hiroshi (Associate Professor, Disaster Prevention Research Institute, Kyoto University): “Field Survey Report on Heavy Rain over Kii Peninsula in September 2011”
	USHIYAMA Motoyuki (Associate Professor, Center for Integrated Research and Education of Natural Hazards, Shizuoka University): “The Impact of 2011 Typhoon 12 on Human Lives”
	TSUJIMOTO Tetsuro (Professor, Nagoya University): “2011 Typhoon 15, Heavy Rains and Floods: What We Need to Keep in Mind in Emergency Preparations”
	OKI Taikan (Professor, Institute of Industrial Science, the University of Tokyo): “Climate Changes, Social Changes and Future Flood Disaster Mitigation”

Summary

First, Mr. Sayama presented the large-scale flood occurred in Chao Phraya River as an example of the rainfall disaster in 2011. He showed that besides the human life damage, the damages caused by the inundation damage of the industrial complex have been enlarged through the supply chain since this flood struck the suburbs of Bangkok, the mage-city of Asia. Moreover, he pointed out that the causes of the flood are not only because of the total large flow volume, but also because of the delicate watershed system of the Chao Phraya River.

Next was the report by Mr, Takabayashi about the investigations on the rainfall damages in Kii peninsula caused by Typhoon No. 12. He introduced the analysis results of the relation between the increase rate of flow volumes in Kumano River and the flush of the reef in river mouth, and pointed out that the water level did not risen since the reef in the river mouth did not full formed before the Typhoon No. 12.

Mr. Ushiyama presented the characteristics of the rainfall disasters caused by Typhoon No. 12 with the focus on human life. He showed that the long-time precipitation amount of that rainfall disasters was particularly large. As for the characteristics of the human life damage, the number of the dead and missing people was the second-largest since the late 1980s as the casualties of a single disaster, and half of the victims lost their lives by landslide, 1/4 of the victims by the flood in mountainous area. He also pointed out the ratio of the indoor victims was very large, which was unusual in recent years, and the human life damage concentrated on from dawn to morning.

Mr. Tsujimoto showed the whole picture of rainfall disaster while making the comparison of the heavy rainfall and flood disasters caused by Typhoon No. 15 struck Nagoya with Tokai heavy rainfalls in 2000 which had similar weather patterns. He discussed divergence of the spatial distribution of rainfall, the

difference between the vertical change of river flow, effects of the special emergency project for countermeasures against intensive disaster, and the issues that need to pay attention to in rainfall and flood disasters, such as the spatial difference in the progress of river improvement work. He further recommended the standardization of hazard map and evacuation order.

Mr. Oki provided the guidelines on the specific measures of flood disaster mitigation referring the large-scale flood in Chao Phraya River, Thailand, in 2011, as an example, and gave some general proposals on climate changes, social changes, and future flood disaster mitigation. In particular, he showed the relationship between global warming and flood risk, and emphasized the importance of quantitative impact assessment with the consideration of global warming and social changes.

From the above speeches and discussions, we were able to provide specific guidelines to some extent on how we should prepare and respond to intensive, torrential rains.

6)“Recovery and Rehabilitation Plans for the Affected Areas: Present Status, Challenges and Future Vision1” Organizer: Post-Earthquake Recovery & Reconstruction Committee and Creative & Innovative Reconstruction-PI System Committee	
Subject	The current situation and the issues of the recovery and the rehabilitation of the widespread affected area are diversified due to various regional characteristics and damage situations. This session is expected to be an opportunity for comprehensive discussion of this diversification based on both hard and soft side countermeasures from a global perspective. The global perspective is presented from the proposal based on the investigation of the this earthquake by ASCE (American Society of Civil Engineers). In addition, analysis and examination will be made on the current situation and the issues in the recovery process.
Coordinator	KISHII Takayuki(Professor, Nihon University)
Presenters	Alex Kwok-Kuen TANG（L & T Consulting Inc, ASCE）: “Lifetime Performance Assessment”
	IEDA Hitoshi (Professor, The University of Tokyo) “Infrastructure Development for the Reconstruction of the Disaster-Afflicted Areas: Issus and Recovery Forecast”
	KITAHARA Keiji (Professor, Hirosaki University) “Platform for Supporting the Disaster Area from Restoration to Regeneration”

Summary

Mr. Tang showed his perception on the issues of the infrastructure damage to electricity, information, transportation, gas, water and sewage, based on his experiences of one week investigation in the affected areas in June, 2011. He emphasized the necessity of having a balanced measure with the awareness of the interdependence of the lifeline, ensuring redundancy, and enhancing the resilience power, and stressed the importance of an integrated approach with the combination of prevention countermeasure, disaster prevention awareness and recovery plan.

Mr. Ieda clarified the damage situation from an infrastructure viewpoint as well as the present status and the issues on the recovery of the affected areas. He analyzed the present situation of building a two-stage anti-disaster system in accordance with the changes made to the technical standards and pointed out the difficulties in realizing the integrated recovery (balance of the reconstruction of safety, life, and livelihood) as well as the necessity of the regional cooperation (role sharing) in the future in the harsh reality of population declining.

Mr. Kitahara introduced the various support activities that had been taking by the Kitakami Recovery Station established in cooperation of Kitakami city and The City Planning Institute of Japan. He stressed the necessity of cultivating resilient power in the region, which was a must of regional regeneration. He pointed out the importance of “enhancing the resilience power in advance” through the communication between the local residents and the experts as enablers before a disaster occurs and smoothly connecting activities in case of emergency.

7)"Recovery and Rehabilitation Plans for the Affected Areas: Present Status, Challenges and Future Vision2" Organizers: Post-Earthquake Recovery & Reconstruction Committee, Creative & Innovative Reconstruction PI-System Committee, and Radioactive Waste Countermeasure Civil Engineering Committee	
Subject	In the recovery of the affected areas, the way of supporting system and the way of discussion in the complex organization are pointed out as the issues to be tackled related to the institution and discussion items. In addition, the desirable image of local autonomies (cities, towns and villages), the way of intention understanding and consensus building, and the range of the targets for consensus building are pointed out as the issues related to process. Regarding to these issues, in this session, under the topic of the present status, the challenges and future vision of the affect areas, from the perspective of "Consensus Building", we will have panel discussion by the Infrastructure Reconstruction Committee, Creative & Innovative Reconstruction PI-System Committee, and Radioactive Waste Countermeasure Civil Engineering Committee, and we will also obtain some suggestions for future reconstruction.
Coordinator	NOZAKI Hidenori (President, Oriental Consultants, Co., Ltd.)
Panelists	UENO Shunji (Director, Kokusai Kogyo Group)
	KAWANISHI Motoi (Central Research Institute of Electric Power Industry)
	HIRANO Katsuya (Associate Professor, Tohoku University)

Summary

In this session, first, Mr. Ueno, Mr. Hirano, and Mr. Kawanishi introduced the activities of each committee and the issues of recovery in the affected areas from a viewpoint of their expertise.

After that, based on the issues raised in their speeches, a panel discussion began with a discussion of "The system and issues to be tackled for recovery" and "The Process for the Recovery" was carried out.

Mr. Ueno mentioned the support from experts and consultants to the local government that could not establish a well-functioned system in the process of consensus building for the recovery, and pointed out the need for the early establishment of executive scheme of reconstruction works by public-private partnership which was capable of providing continuous support. In addition, as for future issues, he mentioned the present situation that consensus building of the specific projects for recovery in each region and area was in progress and pointed out the need for an integrated method of consolidating the results of consensus building in each regions and areas.

Mr. Hirano mentioned the need for a unified decision-making (responsibility) in the vertical (divisions, sectors) and horizontal (country, prefectures, cities, towns and villages) organizations in the reconstruction of regional infrastructure. He also pointed out the importance of leadership of the local chief executive, and the necessity of constructing institutional and financial foundations to support that leadership. In addition, as for future issues, he mentioned excessive requirements from citizens and business sectors, the way to make a break of the excessive development of local governments in the background of population declining, and further pointed out the need for human resources capable of properly facilitate the conflict between the resident consciousness of real experiences with the development level of social infrastructure.

Mr. Kawanishi pointed out that the importance of building an environment for communication for the consensus building among stakeholders of country, local autonomies (prefectures, cities, towns and villages), local people, business sector, as well as the importance of sharing and dispatching correct and accurate information. In addition, he further pointed out the need for having a coordinator who could establish credibility of the stakeholders and owns certain authority to execute those efforts, as well as the need for a discussion on the measures for radioactive waste treatment coupled with a new concept of urban development.

There were also some comments from the floor, such as "it is necessary for JSCE to make a proactive proposal on the community building after the recovery through the cooperation among industry, government and academia, including local industries such as agriculture and fishery.", "It is necessary for JSCE to make a proposal or a research targeted on the people in temporary housing and evacuee."

8）“Regional Disaster Preparedness and Response Planning: Prepare for Infrequent yet Destructive Large-Scale Disasters”
Organizer: Regional Disaster Preparedness and Response Planning Committee

Subject	Regional Disaster Preparedness and Response Planning Committee consolidated the issues from the view point of whether regional disaster preparedness and response plan functioned effectively in the Great East Japan Earthquake, and published a “Mid-term summary report (draft)” about the desirable image of regional disaster preparedness and response planning as well as the measures to realize it. In this report, it pointed out that to establish and implement comprehensive disaster mitigation management systems; to establish disaster mitigation countermeasures matrix; to establish planning process and systems on regional integration; to make a standardized rule in responding to disaster and to establish a wide-range regional cooperation. The summary of this report was introduced by the keynote speech. In addition, this committee plans to make a guideline on the actual plan development for local autonomies, and the direction of this guideline will be discussed with the administrators of disaster prevention in the panel discussion.
Coordinator	SAEKI Mituaki (Executive Vice President, Eight-Japan Engineering Consultants Inc.)
Keynote speaker	MEGURO Kimiro (Professor, Institute of Industrial Science, The University of Tokyo) “Appropriate Regional Disaster Preparedness Planning and Implementation of Disaster Mitigation Measures Matrix”
Panelists	The above 2 persons and:
	HIRAI Hideki (Counselor for Disaster Management, Cabinet Office, Japan)
	IWATA Takahito (Shizuoka Prefecture, Japan)
	KAGIYA Hajime (Itabashi Ward, Tokyo)
	IRIE Sayaka (NHK)

Summary

First, a keynote speech was made by Mr. Meguro the chair of “Regional Disaster Preparedness and Response Planning Committee.” He pointed out the issues of present regional disaster preparedness and response plans (the goal setting of disaster preparedness and response, and the concept of management cycle to achieve the goal were insufficient and not practical.), and further pointed out that the PDCA cycle which applied to “disaster mitigation measures matrix” should be introduced.

Then, each panelist expressed his views. Mr. Hirai introduced the efforts made by each ministry on the disaster prevention measures after the earthquake, and Mr. Iwata introduced the efforts made by Shizuoka Prefecture on the integration of the “crisis management system” in the normal time with the “decision-making system” under the emergency situation. Mr. Kagiya pointed out that in order to establish a “local autonomies scrum” of disaster prevention which would include local autonomies and industries, academia and the public, it was very important to take specific actions in normal times. Ms. Irie clarified the issues on information dispatch in the stages of pre-disaster- emergency- post-disaster.

After that, discussion was made on “the issues on concretizing the desirable image of future regional disaster preparedness and response plan.” Mr. Hirai stated the importance of introducing a numerical goal in disaster mitigation, and the need for the participation of the local people in the consensus building of the goal setting. Mr. Iwata emphasized the importance of educating and cultivating human resources that can correctly understand risk. Mr. Kagiya pointed out the importance of making a support-receiving plan for the collaboration among local governments, and Ms. Irie pointed out the need for continuously sending information as to ensure the safety other than the evacuation information at the point of disaster occurring, as well as the need for preparing the method to realize it in advance.

Last, we received many comments and questions from the audience and the session ended with an active discussion. Those comments and questions were: the need for establishing a crisis management agency, question about the way of material support in the disaster, questions about the timing of releasing the forecast results of earthquake intensity in consideration of the re-examination on epicentral areas of a possible massive earthquake along with the Nankai trough discussed in the Central Disaster Management Council.

Many participants participated in this session, which indicated a strong interest that the public had in the topic of the session.

9）“Disaster Preparedness and Emergency Management: Wise and Effective Use of Human Network, Physical and Technological Resources”

Organizers: Disaster Mitigation and Management Committee and Reconstruction Engineering Technology Committee

Subject	This session discuss the works on rescue, reconstruction and recovery in the Great East Japan Earthquake from the perspective of management under the crisis situation of disaster. In addition to the introduction of the investigation and research findings of Disaster Mitigation and Management Committee and Reconstruction Engineering Technology Committee, panel discussion will be carried out on theses topics to deepen the discussion. The discussion will be made on the problems, issues, and good examples in the works on rescue and reconstruction based on the hearing and the questionnaire in the affected area, and further will be extended to the recovery in the future. Moreover, based on the knowledge gained from this investigation and research, some recommendation will be made on the desirable way of disaster mitigation and management for the preparedness of Tokyo Metropolitan Earthquake and Tokai Earthquake that is afraid of happening.
Coordinator	OZAWA Kazumasa (Professor, The University of Tokyo)
Reports by Committees	MATSUMOTO Naoya (Research Institute of Construction and Economy): “Disaster Mitigation and Management Committee”
	KAZAMA Masaru (General Manager, Kajima Corp.): “Reconstruction Engineering Technology Committee”
Panelists	OZAWA Kazumasa (Professor, The University of Tokyo)
	ONO Takehiko (Vice President, Shimizu Corp.)
	FUKASAWA Atsushi (Assistant Vice-Minister, Ministry of Land, Infrastructure, Transport and Tourism)
	TAKANO Shinei (Professor, Hokkaido University)
	YOSHIDA Akira (Technical Advisor, Taisei Corp.)

Summary

First, Mr. Ono made a greeting speech. He mentioned that the session would discuss emergency responses from a disaster management perspective and expressed his expectations that some proposals on future vision would be made.

Following the greeting speech, as a committee activities report, Disaster Mitigation and Management Committee reported that based on the evaluation on the activities of administration and enterprises from the perspective of management, they planned to make a proposal on the feedback to institutions, and found out some specific issues and good examples related to wide-range support, activities of construction industries, selection and concentration of disaster response measures, and measures taken to adjust to the situations. Reconstruction Engineering Technology Committee reported the “debris treatments and its reusages”, which was an important issue of the recovery and reconstruction as well as technical support to the affected local autonomies. In particular, in collaboration with Sendai city, they technically proved the possibility of reusing the tsunami sediment as materials to build road embankment and showed the future possible development of sediment reuse.

Then, a panel discussion was carried out by Mr. Ozawa the coordinator. Regarding the recovery from the disaster, Mr. Yoshida introduced that the technologies of private sector were very effective for recovery works, and necessary to establish a system to properly use them. Mr. Takano emphasized the importance of decisive leadership in the reconstruction in an emergency situation, and introduced that the operation with clear guideline at an early stage was very effective. Mr. Fukasawa explained that as the action of the MLIT in the initial stage in the post-earthquake, it was very important to clarify the sense of duty and mission, to understand and share accurate information, and to establish mutual trust among organization leaders.

Mr. Ono explained that it was important to make a proposal meet the actual situation of each region for reconstruction, and it was necessary to simplify a command system and to make a rapid decision and response. Regarding future disaster preparedness, Mr. Fukasawa explained that the management that conveys the experiences of disaster was needed, and as a civil engineer, it was necessary to consider the disaster mitigation and management from the national perspective. Last, Mr. Ono made closing remarks. He mentioned that we should embed the disaster prevention system which would function in an emergency situation into the activities of normal times and call for a discussion on the cultivation of human recourses capable of looking at the whole picture at normal times.

10)"ICT Development for Disaster Resilience and Traffic Control Management: To Achieve the ICE for Emergency Response"
Organizer: Committee on ICT-Based Natural Disaster Risk Management and Resilience Development

Subject	"Committee on ICT-Based Natural Disaster Risk Management and Resilience Development" dispatched the Third Comprehensive Investigation Team on the Earthquake in cooperation with The Institute of Electronic Engineers of Japan, and they examine the disaster resistance measures, traffic system control, and means for information distribution by utilization of ICT and ITS based on the investigation results. In this session, experts from various fields such as System Engineering, Transport Engineering, Information Engineering will make discussion on the topics of what is the desirable ICT technology that is actually useful in the case of disaster, and how to provide information support to the movement of people and goods, and will try to clarify the desirable image of ICT that useful in the case of emergency.
Coordinator	YAMADA Harutoshi (Project Professor, The University of Tokyo)
Presenters	MAKINO Hiroshi (Associate Professor, The University of Tokyo): "The 3rd JSCE Tohoku Earthquake Disaster Research Team Report"
	KAWASHIMA Hironao (Emeritus Professor, Keio University): "ITS in en Emergency Situation"
	FURUHASHI Daichi (The University of Tokyo): "The Launch and Operation of "Sinsai.Info" Network"
	KUWAHARA Masao (Professor, Tohoku University): "Current Freight Transportation and Logistics Services: Current Emergency Operations and Issues"
	HAMAOKA Hidekatsu (Associate Professor, Akita University): "Disaster Traffic Management, Challenges and Future Perspectives"

Summary

Firstly Mr. Makino made a presentation on the investigation results of the Third Comprehensive Investigation Team sent in June, 2011. He presented that the Great East Japan Earthquake happened in the time that informatization was in progress, though it came out that the power of consolidated probe data and Twitter had made significant contribution, on the other hand, telephone and internet could not be used and their troubles caused obstacles on information collection, distribution and safety confirmation, showing the vulnerability of a information-driven society. In order to overcome its vulnerability, countermeasures were proposed from the perspective of "Disaster Resilience."

Next, Mr. Kawashima introduced the communication difficulty and traffic congestion occurred after the Great East Japan Earthquake, and presented the front-line knowledge on the realization of prioritized communication systems, communication media for evacuation guidance. In particular, he introduced that the U.S. has been tackling to simplify and unify the application process of supporting services in disaster, to ensure the communication among government agencies, and to share the disaster information based on E-Government Act 2002.

Mr. Furuhashi introduced a website named "sinsai.info" that consolidated and distributed various information. It was the website established by making the best use of past experiences such as the activities after Haiti earthquake occurred in January 2010, and the open street map. These efforts worked effectively in handling a large amount of information at the time of disaster.

Mr. Kuwahara presented on the results of a logistics services survey that was carried out to understand the whole picture of logistics services for emergency relief supply as well as the difficulties in that survey. Those results were valuable as records of logistics services in the event of earthquake.

Mr. Hamaoka presented the issues of evacuation in times of disaster and pointed out that introduction of roundabout was effective as a measure to cope with signal failures due to electric power blackout. He further emphasized that it was important to instill the culture of prioritizing pedestrian over vehicles.

The Great East Japan Earthquake occurred in the time that informatization was in progress. Since there were some good points that information was well- collected and distributed and bad points, we should draw on these experiences in the use of ICT at the time of disaster, and examine countermeasures against future disasters.

11）“Networking and Collaboration to Prepare for Cataclysms- Task Force on Reconstruction Designs for a Disaster Resilient, Safe Land Structure”

Organizer: JSCE Regional Chapter Group on Reconstruction Design for a Disaster Resilient, Safe Land Structure

Subject	The Great East Japan Earthquake, which occurred in the time when social structure and disasters was under change, has caused serious damages. These damages brought out again the vulnerability to disasters of our country, and the reconstruction designs for a safe land structure have become the urgent need in whole Japan. Regional Chapter Task Force on “Reconstruction Design for a Disaster Resilient, Safe Land Structure”(hereinafter, Chapter TF) is an organization anchored by JSCE regional chapter, which is established to prepare for various coupled phenomena caused by the assumed natural disasters based on the feature of each local areas in Japan. In this session, we will first look to the whole picture of the basic points of reconstruction designs for a disaster resilient, safe land structure by the keynote speech, and then the representatives from each chapter TF will have a panel discussion on the massive disaster (cataclysms) assumed by each regional chapter and the collaborative activities to prepare for them.
Coordinator	HAYASHI Yoshitsugu (Professor, Nagoya University)
Keynote Speaker	「Toward the Redesign of the Safe country Building」 KOMURA Kenyu (President, Japan Water Agency)
Panelists	The above 2 persons and:
	JSCE Hokkaido Chapter Task Force, HAGIWARA Toru (Professor, Hokkaido University)
	JSCE Tohoku Chapter Task Force, HISADA Makoto (Professor, Tohoku University)
	JSCE Kanto Chapter Task Force, YAMADA Tadashi (Professor, Chuo University)
	JSCE Chubu Chapter Task Force, TSUJIMOTO Tetsuro (Professor, Nagoya University)
	JSCE Kansai Chapter Task Force, SHIGEMATSU Takamasa (Professor, Osaka Municipal University)
	JSCE Chugoku Chapter Task Force, ICHII Koji (Associate Professor, Hiroshima University)
	JSCE Shikoku Chapter Task Force, ITAYA Eiji (Professor, Ehime University)
	JSCE Seibu Chapter Task Force, TSUKAHARA Kenichi (Professor, Kyushu University)

Summary

Coupled Phenomenon – A chapter representative introduced the “reconstruction designs for disaster resilience, safe land structure” project which aimed to examine the possible damages of coupled complex disaster and develop a countermeasure menu by applying a new methodology of cross-field collaboration dialog.

The vice chapter representative pointed out the vulnerability of Japan to various natural disasters besides earthquake based on different data in the keynote speech. In addition, he pointed out it was indispensible to clarify the cause mechanism of disasters, to find out causes of damages and the method to break the chain reaction by using a backcasting method that started from a disaster prevention level required in each region, and to develop a recovery plan before massive disasters may occur.

In the panel discussion, preparedness for various disaster in each region was presented by respective chapter TF, and the disaster database, archive projects that each chapter TF was working on were also introduced. In addition, the importance of preparedness to risky hazard, the need for sharing of information on disaster before and after the disaster, the specific problems of a region related to the disaster prevention capability and economy situation were mentioned. Moreover, a chapter TF pointed out that there was a gap of safety awareness between Japan and overseas societies by showing the example that Japan received low evaluations by IOC when applying to host an Olympic Game due to their concerns on safety in a candidate city, thus it reaffirmed the importance of TF activities aiming to enhance the public awareness. The Tohoku chapter that was in the affected area, showed that there was the chain reaction of the disaster which surfaced only after one year after the Great East Japan Earthquake. All participants of this session realized that the issues that Chapter TF and Chapter Collaboration deal with were large and heavy.

12）“Revitalizing the Japanese Engineering Industry with Intra-Industry Cooperation”
Organizer: Secretariat of Special Committee on 2011 Great East Japan Earthquake

Subject	Though Japan's science and technology is mostly highly evaluated even in the world's leading areas, it becomes more serious year by year that the young people are getting apart from technology, and their academic abilities is declining. Under this situation, the Great East Japan Earthquake with nearly 20,000 victims occurred coupled with the nuclear crisis. It is exactly the loss of engineers who have been advocating the safe and secure country building. Although it is a commonsense move that the area of expertise becomes segmentalized along with the advancement of technology, the cease of communication due to the barriers among the different fields has a negative impact on the social safety. Now it is the time for engineers to cooperate and make efforts on revitalizing the engineering industry and enhancing social safety. In this session, we would like to take this opportunity of the panel discussion among engineers to work on strengthening the intra-industry cooperation.
Coordinator	HIROSAKI Botaro (Vice President, The Japan Federation of Engineering Societies)
Panelists	SATO Junichi (President, The Japan Society of Mechanical Engineering)
	SHIRAI Toshiaki (Vice President, The Society of Instrument and Control Engineers)
	NAKAJIMA Nobuo (Vice President, The Institute of Electronics, Information and Communication Engineers)
	WADA Akira (President, Architectural Institute of Japan)
	YAMAMOTO Takuro (President, Japan Society of Civil Engineers)

Summary

In this session, we invited the representative from Japan’s leading academic society in engineering, and discussed the issues of social safety brought out by this earthquake, and what was necessary to rebuild the public trust in engineers. In particular, the discussion focused on how to break down the barriers between different fields and technology segmentation due to the advancement of technology specialization and to enhance the cooperation.

Last panelists exchanged their ideas on what kind of approach should be taken to ensure the safety of a giant system for engineering as a whole, which was brought by this earthquake. It was pointed out that in order to achieve social safety, the three perspectives from the public, business sector and designer were all needed, and the understanding of the whole picture besides the expertise was required from the perspective of the designer. Therefore, it was necessary to cultivate the human resource that works in the cross-field environment and links the different fields.

In addition, regarding the unexpected external force in design, it was pointed out that we could not disclaim responsibility as it exceeded the design condition, but had to build civil engineering structures with the toughness that could withstand in an unexpected situation. On the other hand, we pursued optimal designs while optimality and toughness were in trade-off relationship. Regarding this, it was pointed that the fact that local optimization could not become the overall optimization should be recognized, and a question was that how we should think of the standard of value in various values and vectors.

In the future, it was necessary that a development direction should focus on social safety and security and the realization of a sustainable society instead of pursuing effectiveness and industrial development. To achieve this direction, it was important to strengthen the cross-field cooperation and bring together the wisdom of experts around the country.

6. **Messages for JSCE**

1) Carlos S. OLIVEIRA (President, Portuguese Association for Earthquake Engineering)

1. Introduction

Included in the JSCE 2011 Great East Japan Earthquake Symposium which took place in Tokyo University 5-7 March 2012, Prof. Carlos Sousa Oliveira from IST/UTL (Instituto Superior Tecnico/ Technical University of Lisbon, Portugal) (Full Professor, President of the Portuguese Society of Civil Engineering, and Chairman of the 15WCEE Organizing Committee) made a presentation in the Session: “Implementing effective natural disaster risk reduction, preparedness and response”, with the title “Actions after the 1755 Lisbon earthquake and their consequences”. The presentation was supported on a Power Point and the main topics developed are summarized in the following Extended Abstract.

Keywords: Historical earthquakes; 1755 Lisbon earthquake; economic impact; immediate post-event actions; reconstruction policies; seismic resistant techniques

2. Extended Abstract

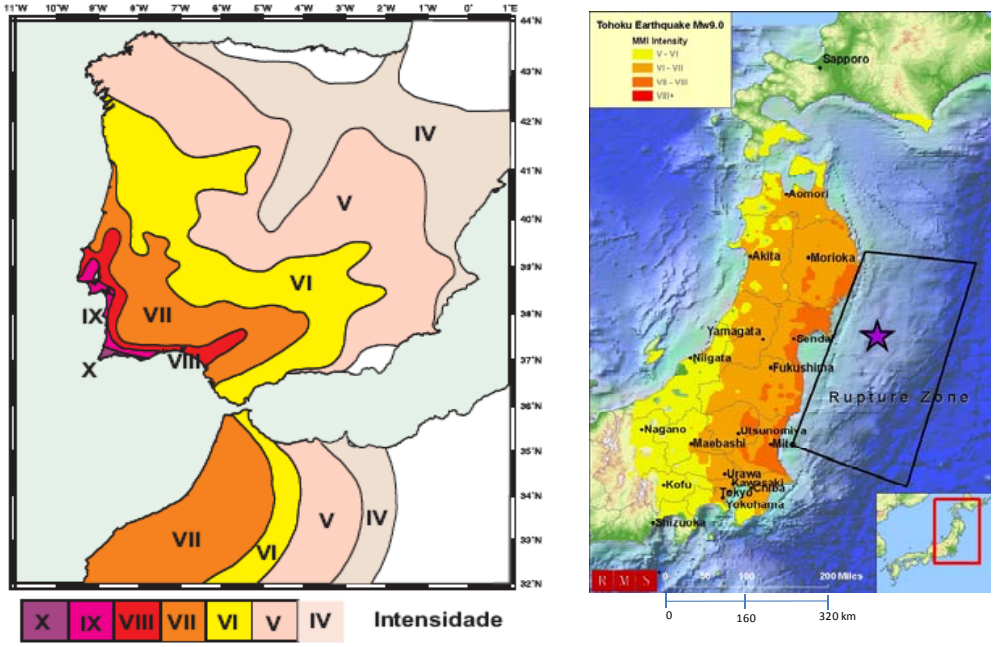
The importance of the 1755 Lisbon earthquake is known worldwide not only among the scientific and technical communities but also in many other areas of knowledge. After a brief account of the most important aspects of the 1755 Lisbon earthquake in what refers the origins of this unique event and to the extraordinary consequences in Portugal and surrounded countries, attention was focused on the actions taken right after the event as well as in the mid and long run. Reconstruction lasted for many decades and the earthquake brought in a set of new developments which definitely marked the downtown of Lisbon until nowadays.

The presentation highlighted the most important aspects of the immediate post-earthquake emergency measures and essentially described the main concerns with the reconstruction. Topics such as the new downtown urban trace, the architecture of the façades and interiors, the concerns with seismic and fire resistance of the new buildings, and the introduction of an industrial concept in the construction development to accelerate the reconstruction, were among the most interesting issues discussed. Technical aspects of the new construction dealing with the height of buildings, the foundation over the rubble of the old demolished town, the massive use of the “gaiola” (wooden cage) as the most important seismic resistant element, etc., along with the juridical aspects of the new land-use distribution of households, were briefly presented.

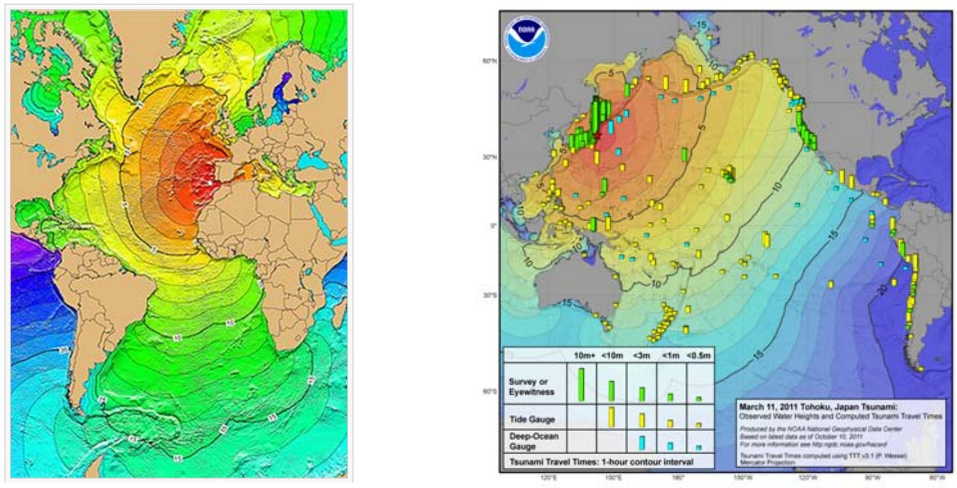
Finally, an account on how, 250 years after the earthquake, the scientific and technical communities look at this important legacy was discussed in view of modern seismology and earthquake engineering advancements. The long period of time without any major earthquake has brought in many difficult problems to the Lisbon post-1755 construction derived from the aging of materials, the change of use of most buildings, etc. This is marked by a large number of questionable interventions, which are challenging the decision makers on the best solutions to adopt.

Comparisons with recent very strong and rare events, such as the Tohoku 2011 earthquake, are very important to draw lessons contributing to the mitigation of the seismic threat of similar events. The Japan’s worst earthquake and tsunami disaster of March 11, 2011 maybe comparable with the Lisbon earthquake occurred in 1755. These two natural disasters consist, in fact, of a succession of multiple events, shaking, tsunami and fire (and nuclear disaster) causing unexpected huge consequences. At that time, the Lisbon Earthquake set in motion a revolution in many areas, from scientific and technologic knowledge, to new currents in philosophy and deep influence on cultural matters, national and European. This was the starting point of Earthquake Engineering in Europe, with many innovations. Nowadays, the world is entirely interconnected and knowledge is widespread and available. The Tohoku 2011 will also

cause a transformation on several areas of knowledge, with a shift of mind thinking either in Japan or worldwide. Earthquake Engineering will greatly evolve with the many lessons learned, and the world will be introduced to new means of protection and safeguard of human lives and properties.



Comparison of intensities (MMI) of 1755 Lisbon (left) and 2011 Tohoku Earthquakes (right)



Comparison of propagation times of 1755 Lisbon (left) and 2011 Tohoku tsunamis (right)

Comparison of propagation times of 1755 Lisbon (left) and 2011 Tohoku tsunamis (right)

Acknowledgements
JSCE – Japan Society of Civil Engineers
Lisbon, 4 April, 2012
Carlos Sousa Oliveira
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Researcher of ICIST, csoliv@civil.ist.utl.pt
Chairman 15WCEE Organizing Committee

ANNEXES:
Power Point Presentation for the 5 March 2012
Oliveira, C.S. 2008. Review of the 1755 Lisbon Earthquake Based on Recent Analyses of Historical Observations. Book evocating Jean Voigt. in Historical Seismology, J. Fréchet et al. (editors), pp 261-300, Springer Science+Business Media B. V.

2) Jenn-Chuan CHERN (Minister, Public Construction Commission, Executive Yuan)

The great shock of 311 Great East Japan Earthquake has led to the deepest sorrow and concern throughout the world. As a neighboring and friendly country with the similar natural environments and culture, Taiwan has expressed strong national heartfelt blessing and support to the rescue stage and reconstruction of Japan after the disaster. In past twelve years, Taiwan has suffered two major disasters, which were Ji-Ji Earthquake in 1999 and Typhoon Morakot that struck on August 8th, 2009. The destructive power of 311 Great East Japan Earthquake brought much tougher challenge to Japan than that experienced in Taiwan. The response to different styles of mega-disasters may be different; however, the sharing of response measures is very important. Japan is regarded as the one of the best country to have modern infrastructure, hazard prevention equipments and techniques, and well trained professional personnel and people. However, we still need to respect and learn more from the nature.

In the face of the impact of disasters due to climate change, we are faced with the era of frequent interactions with disasters. Large-scale disasters require large-scale actions, continuing reconstruction, nationwide mobilization, and experienced teams. In the face of potential disasters, in addition to strengthening disaster prevention, we must reconstruct at a fastest rate to recover our national strength. Based on the Morakot post-disaster experiences, in order to effectively respond to the disaster prevention, disaster relief, and reconstruction of major disasters, an efficient social management system model should be constructed, so as to integrate the government, NGOs, and enterprises' disaster prevention and relief and reconstruction capabilities as well as consolidate the idea that "disaster prevention is more important than disaster relief; moving away from disasters is more important than disaster prevention" as an early response measure for disaster prevention and protection. That means the practices of simultaneous disaster prevention and relief and reconstruction was necessarily adopted to avoid subsequent disaster.

After the Typhoon Morakot disaster, the government amended the Disaster Prevention and Protection Act on August 4th, 2010, strengthened the responsibilities of the local governments, enhanced the government's disaster prevention and relief levels, and amended disaster relief as a mission to be actively undertaken by the national military forces. Forecasting, warning, monitoring network, and disaster prevention exercises were also strengthened in order to achieve the practice of "be lenient to comprehend the strong enemy, be strict when defending the enemy, deploy the military in advance, and be prepared for disaster prevention and relief at any time". This practice was strengthened and consolidated when faced with typhoons and torrential rains that took place after Typhoon Morakot, which in turned contributed to the enhanced disaster prevention and relief capabilities of the central government, local governments, and people.

3) Lesley Carol EWING (Senior Coastal Engineer, California Coastal Commission)

I wish to share my appreciation for being asked to attend and present Great East Japan Earthquake and Tsunami Symposium. I greatly value the opportunity to participate in discussions relating to the lessons learned from the event, options for rebuilding and recovery and the need for thoughtful planning for community resilience. The Japan Society of Civil Engineers, the Port and Airport Research Institute (PARI), the national government and the many academic institutions who have been involved with post-event surveys and analysis has set a high standard for thorough and scientifically valid work. The open sharing of information and frank discussions of follow-up activities is to be commended and can provide a guide to other nations for ways to approach future disasters of a similar magnitude.

In May 2011, I participated in a week long field survey of coastal protection structures as a member of a joint American Society of Civil Engineers – PARI Team. Details of our findings were presented at the Symposium and will be published soon by ASCE. In general, we found that although protection structures were overtopped and unable to protect the inland areas from inundation, many of the structures themselves were designed and engineered to withstand the tsunami loads. Some of the most often noted mechanisms for damage to or failure of protection structures were scour, poor foundations, weak connections between structural elements, and designs that did not anticipate that the structure might be overtopped. On behalf of the members of this team, I convey our hope that this information can help in decisions for community building and recovery in Japan and that it can also help inform the design and engineering of protection structures in other part of the world.

The Great East Japan Earthquake and Tsunami Symposium provides an important foundation for the necessary discussions about where it may be appropriate to rebuild, the levels of protection that should be provided for coastal communities, and the appropriate interactions between engineering, land use planning, education, warning systems and governance for ensuring future community resilience. These discussions will occur at local, regional and national levels. These discussion will take time to reach resolution and the resulting decisions will have far-reaching consequences. I commend you for your efforts to engage in and help bring sound technical guidance to these important decision-making efforts.

With Regards,
Lesley Ewing

4) Subandono DIPOSAPTONO (Ministry of Marine Affairs and Fisheries, Indonesia)

Recent Progress on Tsunami Disaster Management in Indonesia

Indonesia has long been affected by Tsunami. There are records of more than 100 such events over the last 400 years. These records indicate that between 1600 and September 2010 there have been 110 tsunamis. From 1960 - 2010 there have been 23 significant tsunamis. This indicates that the frequency of tsunamis is around one in every two years[1].

Some of Indonesian coastal areas of highest potential risk by tsunami include: the West coast of

[1] Number of earthquake events may decline logarithmically with increased intensity of the event. Time interval increases. Tsunamis may also follow this pattern.

Sumatra, South coast of Java, South coast of Bali, North and South coast of Nusa Tenggara, islands of Maluku, North coast of Papua, and most of Sulawesi (Celebes) coast.

The recent developments in Indonesia have been forcing the new awareness and direction in disaster reduction initiatives. The enactment of Disaster Management (Law No. 24/2007) and Coastal and Small Island Management (Law No. 27/2007) provide Indonesia a strong legal basis for better disaster reduction program. According to this law, disaster reduction should be institutionalized through national and local development plan. This perspective will ensure the sustainability of the program in term of planning and budgeting.

To reduce the impact of coastal disasters in Indonesia, nationally we always improve our capabilities to mitigate these events. The Ministry of Marine Affairs and Fisheries (MoMAF), Republic of Indonesia is also pro active in minimizing the impact of coastal disaster on coastal communities and on aquaculture activities. The program emphasized the implementation of Integrated Coastal Zone Management (ICZM). In ICZM we will try to make a balance between the natural resources, human utilization, and disaster mitigation aspects.

The Indonesian coastal ecosystem have suffered severe degradation wich lead to increase the vurnerability of the coastal area. In this regards, habitat rehabilitation is very important in order to reduce the vurnerability. The objective of the habitat rehabilitation is to increase the coastal environment capacity to provide its services for livelihood and protection from coastal hazards. It has been implementing in the form of coastal forest and mangrove planting, coral reef transplantation, stock enhancement, and conservation.

In the longer time frame of generations, Indonesia's architectural design was adapted to the conditions that are a feature of the region. In more recent times, however, much of this tradition has been ignored with the result that when an earthquake and/or tsunami strikes, many buildings are destroyed and many lives unnecessarily lost.

Early warning saves lives. That's a very obvious lesson from the tsunami event. Early warning systems are considered the foundation of disaster mitigation. With the advances in science and technology, accurate forecasting of the occurrence of a natural hazard has saved thousands of lives and protected properties. It is very unfortunate indeed that the Indian Ocean lacks a tsunami warning system like the one installed in the Pacific.

Indonesia is prepared and committed to develop and manage a National Tsunami Early Warning System (TEWS) as part of the Regional Indian Ocean TEWS.

5) Alex Kwok-Kuen TANG（L & T Consulting Inc, ASCE）

Future Large-Scale Natural Disasters Mitigation, Preparedness, Response and Recovery

LIFELINE SYSTEMS
WHAT ARE THE OPPORTUNITIES?
A Tang, P. Eng., C. Eng., F. ASCE

Abstract
This extreme event provided us with many new lessons and confirmations of mitigation efforts based on past events. One big lesson is this extreme event exceeded the design criteria used.

Lifeline systems along the coastal communities sustained heavy damage most of the distribution systems were completely destroyed. These locations are like a clean sheet of paper ready for any imaginations to rebuild.

However we have more questions in our quest for preparedness and mitigation efforts than answers in this process. The questions are:

1. How big the next event will be?
2. What is the performance of the design?
3. What is the cost benefit?
4. What are the research gaps?
5. What level of resilience is acceptable?
6. Is it sustainable? Or how sustainable should it be?
7. What is the acceptable casualty? (One is too many, my view)

Each question has its acceptable answer or the best answer. But when they have to be considered together as a unit, the consolidated answer will have to be balanced. Since lifeline system is a multi-discipline field, engineers must work together towards the same goal – protecting the future and life.

INTRODUCTION

With a much less frequency of occurrence, the knowledge of tsunami is not well established. This destructive tsunami provided us with many opportunities to do better. Large objects became destructive tools used by the tsunami. Destructive power of fires following earthquake and tsunami also needs further study and mitigation.

Mitigation is cost effective. Being the engine of economic growth and sustaining high standard of living, lifelines that most people have taken for granted during normal times must maintain an acceptable level of services during and after a disaster. In general, performances of lifelines are not good. That is the post disaster services are not acceptable.

LIFELINE PERSPECTIVE

Depending on the network configuration, some networks are more robust than the other. Lifeline aging is becoming a problem in maintenance and cost of operation. Therefore operators of lifelines have a handful of issues in addition to damaging disasters such as earthquake. Incremental and continuous improvements will be the best approach to ensure service reliability and system robustness. Speed of recovery must be part of the equation. A balanced integrated approach must be in place to reduce or eliminate impact due to lifelines interdependence.

When all service providers focus on the end users, reaching an agreed balanced and integrated approach to improve, as a common goal will be achievable. The common goal is resilience, which is defined here as returning to normal after being stressed within a well-defined set of parameters and interval. Some of the parameters are:

1. Magnitude of the event,
2. Acceptable interval of disruption,
3. Capacity to recover,
4. Backup systems, and
5. Emergency preparedness.

Along with continuous improvement the community will become more resilient to disaster impacts.

The coastal communities are a clean sheet that rebuilding to a more resilient community will only be a challenge to imagination and innovation. No doubt, the Japanese engineers and professionals can handle this challenge with their traditional eloquence. However, I like to offer one word – balance.

It is important that research facilities collect performance data of lifeline systems, which helps to reduce future losses, to improve codes and practices, and to enhance performance.

6) Misko CUBRINOVSKI（Professor, University of Canterbury）

Thank you for inviting me to present at your Symposium, 5-7 March 2011, at the University of Tokyo, and share with you our most experience and observations from the 2011 Christchurch (New Zealand) earthquakes. In March 2011, Japan was hit by an extreme earthquake event that brought unprecedented consequences in the form of tsunami, nuclear fallout and severe ground shaking. I visited the affected areas several times and was shocked by the shear devastation, both by its extensiveness and severity of impacts. I was very much impressed, however, by the way Japanese people responded even to such great disaster, with admirable determination and commitment to recover as quickly as possible. While many serious challenges remain ahead, I am sure that the Japanese people will succeed in the recovery and will restore their normal lives quickly, and I wish them all the best and offer my most sincere support in these efforts.

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