Vol.33

# AJCE

## NEWS LETTER 2012


AJCE

ASSOCIATION OF JAPANESE CONSULTING ENGINEERS
(FIDIC Member Association)

## About AJCE

The Association of Japanese Consulting Engineers (AJCE) was established in 1974, and was approved by the Science and Technology agency of Japan (currently, Ministry of Education, Culture, Sports, Science and Technology) as a legal entity in 1977. Representing Japanese consulting engineers, AJCE is a member of the International Federation of Consulting Engineers (FIDIC).

AJCE strives to enhance the status and competence of private consulting engineers (CEs) who are independent and impartial of manufacturers, contractors and others. By doing so, AJCE contributes towards the advancement of science and technology, development of industry, sustainable considerations in built-environment, as well as the enhancement of human safety and welfare.


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" I-Ro-Ha Cards " is a traditional card playing game that has inherited from ancient days in Japan. The cards are composed of 47 pictures on which each card shows Japanese character, " Hirakana " . I-Ro-Ha is an orderly way of expressing Hirakana, similar to alphabet in English. It starts from " I ", then " Ro ", then " Ha " and so on. It is played by 2 to several persons. All the cards are randomly spread out on rush mat, called " Tatami " . A card reader reads a short phrase starting with one of the 47 Hirakanas. Players compete by picking up the card of the same Hirakana that was read by the card reader. A person who got maxim number of cards wins the game. " I-Ro-Ha Cards " is played with friends or family in new year period. People drink green tea while playing the cards.

# AJCE and its Activities

**Noriaki HIROSE**
President, AJCE
President, NIPPON KOEI CO., LTD

**Annual Overview in 2011**

The rehabilitation and reconstruction for the catastrophic damages brought by the massive earthquake and tsunami that attacked eastern Japan on March 11th last year are now moving forward with full-scale implementation, although long-term remedial work will have to be continued to deal with the Fukushima nuclear accident and associated radioactive contamination. AJCE has thankfully received sympathy and condolence from the FIDIC President and member associations towards those affected by this tragedy. Taking this opportunity, I would like to express my sincere gratitude again for the heartfelt and encouraging messages we received. The recovery works are also ongoing for large-scale flood and landslide damages caused by super typhoons that hit western Japan last September.

Unparalleled flood disaster also occurred in central Thailand last year where lives of people and economic activities severely suffered. Extreme climate change prevails around the globe, and heavy floods and droughts are taking place frequently. Japan has a long-standing experience in coping with natural disasters. I believe that Japanese consulting engineers should take a leading role to effectively utilize and share their abundant experiences and knowledge in this area for people suffering from this kind of problems in the world.

Meanwhile, politically unstable situations have been continuing in many countries due to financial difficulties. At the same time, economic activities are still very active in emerging countries like those in Asia where demand for infrastructure development is very strong. Although these infrastructure projects are implemented through various kinds of financial resources, it should be emphasized that transparent project execution process with the use of internationally-recognized standard contract system as represented by FIDIC contracts, is essential to achieve successful completion of projects.

In Japan, the Japan International Cooperation Agency (JICA) plays the dominant role in bilateral assistance for infrastructure development in developing and emerging countries, through technical and financial supports. JICA adopts the FIDIC conditions of contract in its sample bidding documents for construction of Japanese ODA loan projects. AJCE is working to promote a recognition

system for qualified Dispute Board adjudicators under FIDIC contracts, in collaboration with JICA. AJCE established a national list of Japanese adjudicators last May. AJCE is going to expand its activities in close cooperation with FIDIC.

**Major Activities of AJCE in 2011**

● **FIDIC Conference**

The FIDIC annual conference was held in Davos, Switzerland last year, in which AJCE sent 34 participants comprising of AJCE members and their families. The delegates provided presentations in several workshops, introduced leading-edge technologies developed in Japan via exhibition stands, and enhanced relationships with other member associations of FIDIC. During the conference period, AJCE participated in the General Assembly Meeting of the Asia-Pacific Region of FIDIC (ASPAC).

● **AJCE Annual Seminar**

AJCE held its annual seminar on contract documents for consulting service last July, especially focusing on the FIDIC White Book (Client-Consultant Agreement). The participants, who are not only from consulting firms but also from the public sector and mass media, held active discussions concerning business challenges, technical issues and inherent risks. AJCE published the Japanese version of the FIDIC White Book (4th Edition) last year.

● **Young Professionals Exchange Program (YPEP)**

AJCE and Consult Australia (formerly ACEA) have maintained a YPEP since 1996. Although it was scheduled to invite Australian young professionals to Japan last year, said program was deferred until 2012 due to the Great East Japan Earthquake.

● **FIDIC Contract Workshop**

AJCE organized a workshop on Contract Administration for International Construction Project in last September to mark the publication of the Japanese version of the FIDIC Red Book, MDB harmonized edition. The target participants are experienced practitioners in contract administration; however, more than 90 people, which is greater than expected, have attended. The proper administration of construction contracts also draws increasing attention in the Japanese construction industry.

● **Future Activities**

Japan has to steadily proceed with its recovery from the Great East Japan Earthquake/Tsunami disaster and radioactive contamination as a critical issue. Besides, we have to be prepared for future natural disasters, including earthquakes and water hazards. However, in reality, it is becoming difficult to secure sufficient budget even for the necessary maintenance and renewal of existing aged infrastructure due to severe fiscal circumstances. Under such situation, we have to pass on our accumulated technology and experience to the next generation, and reinforce systems to improve our technological assets in order to cope with the looming natural disasters and enable the enhancement of economic and social systems. I fully expect that AJCE will take an active role in human resources development, not only in Japan but also in the world.

# Report on the Great East Japan Disaster - The Year After -

**Hiroshi TANAKA**
General Manager, Research and Development Center NIPPON KOEI CO., LTD

## 1. Introduction

One year has passed since the Great East Japan Disaster that occurred on March 11, 2011. East Japan was hit by one of the most powerful mega-earthquakes and the ensuing gigantic tsunami. The number of people, dead or missing, including foreigners, amounted to more than 20,000. Immediately after the incident, foreign emergency rescue teams from 29 countries and organizations came to Japan. They all sincerely carried out devoted activities in disaster-stricken areas. Relief supplies were also kindly delivered to such areas, and heartwarming condolences and donations were delivered from many countries, regions and organizations. The Japanese people expressed their gratitude to their friends abroad who have extended their helping hands to the victims of the disaster, and will certainly never forget this human Bond.

Japan is now starting its operations from rehabilitation to the course of reviving the stricken areas. Though there are areas that can be gradually rebuilt to their original state before the disaster occurred, there remain many problems in reconstructing regions completely destroyed by the tsunami and recovery treatment in areas polluted by radiation.

The Association of Japanese Consulting Engineers (AJCE) made a preliminary report immediately after the Great East Japan Disaster in the last News Letter issued last April. The following detailed information half year after the disaster was presented in the Natural Disaster Session of the FIDIC 2011 World Conference in Davos held in October, 2011. This paper reports on some topics concerning Japan's experiences and the new insight obtained a year after the disaster.

## 2. Mega-Earthquake and Induced Earthquakes

The Great East Japan Earthquake (Mw=9.0) was the largest based on the observation records in Japan, and was the fourth largest in the world within 110 years since the beginning of the 20th century. The characteristics of the earthquake activities include many large aftershocks and induced earthquakes, neither medium nor small, which occurred for a short time immediately after the main shock. Three large aftershocks greater than M=7 occurred an hour after the main shock, and a total of 11 aftershocks exceeding M=6 occurred within the same day. In addition, a lot of large induced earthquakes continually occurred outside of the East Japan region in about one month after the main shock, as shown in Fig.1.

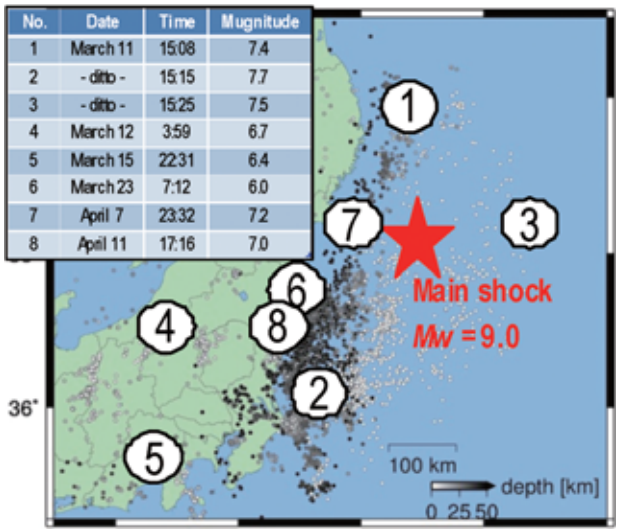



Fig. 1 Induced earthquakes triggered by the main shock

Japan used to estimate the earthquake damage and its measures by paying attention to the maximum earthquake until now. Based on experience from this disaster, it is recognized that earthquake disaster prevention measures should

be examined in consideration of not only the main shock but also in a series of induced earthquakes.

Fig. 2 shows accumulative frequency of the earthquakes (M>=4.5) that occurred in the East Japan area during one year before and after the East Japan Great Earthquake on March 11, 2011 (Data: Japan Meteorological Agency).

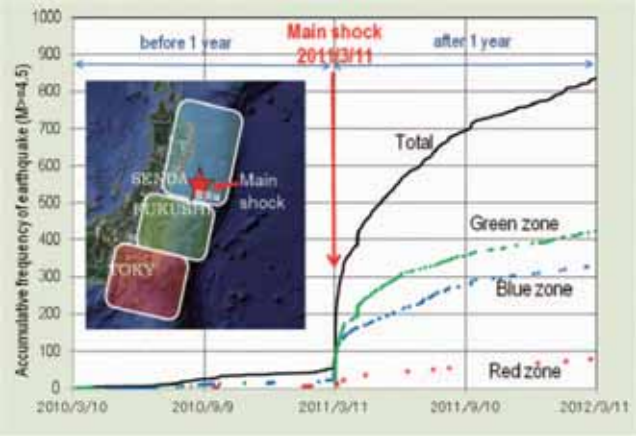



**Fig. 2 Accumulative frequency of the earthquakes (M>=4.5)**

The change in earthquake occurrence frequency one year before and after the main shock can be observed. In the northern area of Miyagi Prefecture, which is near the main shock (Blue zone), an increase of about five times (58→273 events) is noted. Meanwhile, in other regions, the increase observed are: 20 times (20→407 events) in Fukushima and Ibaraki Prefecture in the southern part of the main shock (Green zone); and about eight times (9→70 events) in South Kanto region (Red zone). All these amount to total increase of about 8.5 times (88→750 events in Black dots). The mega-earthquake strongly influenced the seismic activity in a wide area of East Japan, while the effect varies in other regions. Though one year has passed since the disaster and the occurrence of an earthquake is gradually decreasing, it is necessary to continue paying attention to the seismicity in a wide area in East Japan, influenced by the mega-earthquake.

### 3. Weakness in Infrastructure against Mega-Earthquake

The Japanese seismic technology and engineering have progressed through much experience in earthquake disasters and have developed new seismic design method after the Hanshin-Awaji Earthquake Disaster, 1995. The damage of public-social infrastructure facilities by the Great East Japan Disaster, therefore, was limited to repairable levels, though the magnitude of mega-earthquake (Mw=9), continuance of time of the motion (more than two minutes), and the areas influenced by the motion were huge in scale. It was also fortunate that the frequency component of the seismic ground motion that resonated the structures was minimal.

The new lessons learned from this mega-earthquake are as follows;

**a) Damage to private facilities not designed against seismic:** A broad liquefaction occurred along the coast. The liquefaction area in the Tokyo Bay coastal region, which covers about 42 square kilometers, caused either settlement or tilting of a lot of private houses that have not collapsed. Other private houses also collapsed due to slope failure of earth-fill used for housing and land development. It is noted that significant long-term effort is required to restore the damaged private facilities due to budget or residents' consensus for the recovery.

**b) Sway of skyscraper in long-period motion:** The skyscraper in Tokyo Metropolitan City, which is about 400 km from the epicenter, swayed slowly for about ten minutes. The width of the sway at its upper floor was about one meter. The skyscraper in Osaka City, more than 800 km away from the epicenter, also swayed for about ten minutes with about one meter in amplitude (its 52nd floor). In view of the safety of the people staying in the skyscrapers, the prevention of indoor accident by the movement of office equipment (copiers and lockers, etc.) generated by the structure's long period swaying should be ensured, though the skyscraper does not collapse because of high standard seismic design.

**c) Functional breakdown due to incidental damage to facility's without seismic design:** When the mega-earthquake occurred, 27 Tohoku Shinkansen trains, Japan's high-speed transportation system, were running. Fortunately, all the trains have been stopped safely by an automatic emergency brake system synchronized with seismic observation system, that was activated nearly a minute before the mega-shake. However, the transportation

function of the Shinkansen was lost due to the damage of overhead wiring pillars and the collapse of non-structural ceiling elements at the platform of Sendai Station, and then, it took 50 days until the services of the Shinkansen were restored and opened to serve the public. From this experience, it is noted that unlike the main structural components, non-structural elements which are not designed against seismic forces are highly vulnerable to functional breakdown of infrastructures. It is therefore important to consider a balance of the seismic capability of the entire structural system.

**4. Worst Tragedy due to Mega-Tsunami**

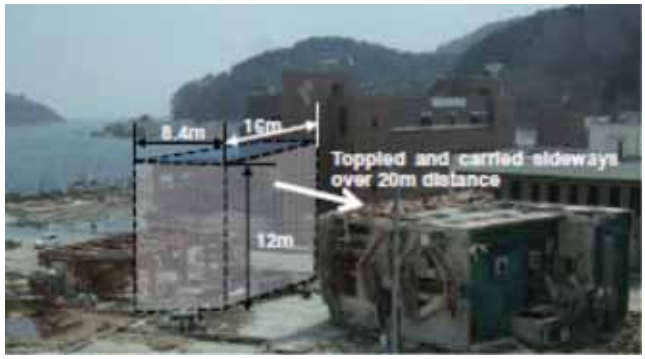
It might be said that the mega-tsunami threatened the people more than the mega-earthquake in the Great East Japan Disaster. Zones of human life and socio-economic activities instantly turned like an ocean due to the tsunami that washed out all infrastructures for citizens' source of living. Ultimately, nothing was left other than debris. This catastrophic threat of the mega-tsunami was reported all over the world through worldwide internet and communication media.

The first tsunami attacked several minutes after the main shock, and then several tsunamis occurred continually. The tsunami damage extended to the Pacific Ocean coastal areas of the northeastern half of Japan Islands, which include regions from Kanto to Tohoku and Hokkaido. The maximum inundation height observed by the site investigation was 21.1 m (Fukushima Prefecture, Tomioka). The maximum run-up height was 40.4 m (Iwate Prefecture, Miyako). Tsunami of about 15 m in high raided along the coast in the Fukushima No.1 Nuclear Power Plant. The flood due to the tsunami extended to an area of about 401 $km^2$.

Number of fatalities due to the Great East Japan Disaster is 15,850 as of February 2012. During the Great Hanshin-Awaji Earthquake (1995, Mw=6.9), about 90% of the 6,434 casualties were crushed under collapsed houses and/or by furniture that fell. However, most of them, 92.5% of 13,007, which were inspected by the National Police Agency, have been drowned in the mega-tsunami. Based on this data, it can be seen that the mega-tsunami was more tragic than the mega-earthquake of the Great East Japan Disaster.

In the Sumatra earthquake in 2004 that also generated a giant tsunami, dead and missing people were about 220,000. In contrast, about 20,000 people were dead and missing in the Great East Japan Disaster. Though 20,000 are not little number, it is about 9% of the Sumatra Disaster. This is attributable to the tsunami disaster education and disaster prevention drills based on the experiences and lessons learnt from past tsunamis in Japan.

It is realized that a tsunami is not a wave but a water mass movement. It has destructive power capable of knocking down a 4-storey steel reinforced concrete building as shown in the photo. It is most important to exert effort in conducting research on the destructive power mechanism of tsunami, and to reflect on the design of tsunami-proof measures as well as carry out tsunami disaster education and practical drills.




Ref. Kazuhiko Kawashima et al; earthquake engineering committee of Japan Society of Civil Engineers
http://committees.jsce.or.jp/report/system/files/Chapter11.pdf
Photo: 4-storey SRC building collapsed due to mega-tsunami

**5. Nuclear Accident and Radioactive Contamination**

Immediately after the occurrence of the mega-earthquake, the power was blacked out in the whole area along the Pacific Coast in the Tohoku Region because power supply facilities were damaged. Three units of nuclear equipment under operation in Fukushima No.1 Nuclear Power Plant were urgently stopped at once, thus the nuclear fission reaction was controlled at that time. About 45 minutes later, an emergency power supply equipment went under the water due to the mega-tsunami attack. Consequently, almost all the nuclear plant equipment, which relies on external electric power, became unavailable. The loss of emergency power supply

due to the mega-tsunami is the first unforeseeable accident.

At that time, it was reported that the safety facility that does not depend on electricity remained functioning. It adopts the method where cooling of the nuclear reactor can be done by circulating water using a pumping system which can be operated through steam made from the decay heat of the reactor core. However, this safety facility was designed on the assumption that power supply will be restored within eight hours, which is significantly less than ten days when power was resumed. Such considerable delay of emergency power supply recovery is the second unforeseeable event.

The nuclear fuel of the three units that lost the cooling means was damaged, eventually causing a melt-through phenomenon. The hydrogen detonation, moreover, occurred in the nuclear power facility buildings of No.1 and No.3 in the process, and radioactive substance was finally discharged outside the furnace. This major accident was announced as level 7, which means a serious accident that impacts on people and environment, based on the International Nuclear and Radiological Event Scale (INES). Level 7 is equal to the Chernobyl nuclear accident in 1986.

Fig.3 shows the distribution of radioactive contamination due to both the Fukushima and Chernobyl nuclear accidents, based on the same reduced scale. It is apparent that a zone of the radioactive contamination in the Fukushima accident is considerably smaller than that of Chernobyl.

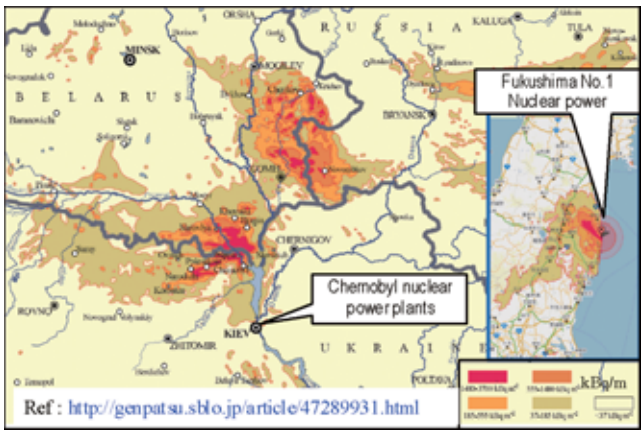



Fig. 3 Comparison of 134Cs+137Cs pollution zone of ground level in Chernobyl and Fukushima (same scale)

It was reported that all nuclear reactors in Fukushima nuclear plant are equipped with cool temperate halt conditions at present. Nevertheless, more than 30,000 people who took shelter at evacuation zones specified by the government are still not allowed to return home.

### 6. Challenges and the Role of Consultants

The important problems to be solved for reconstruction work, which can be seen that these challenges are attributable to tsunami and radioactive damage caused by the nuclear accident rather than earthquake damage, are as follows:

1) Treatment and disposal management on a large amount of rubble.
2) Reduction of radioactive substances and treatment of radioactive waste.
3) Development of alternative energy and stable supply of electric power

For recovery of living condition in the disaster areas and for sustainable development and safety after the nuclear accident, Japanese consultants should make efforts continuously with the following principles:

1) Use of integrated soft and hard technologies to protect lives of people from mega-disaster.
2) Leadership of civil engineers is vital for determining the best diverse solutions.
3) Transfer of information throughout the world and to the next generation regarding Japan's experience and the findings obtained from the disaster.

(Received March 12, 2012)

# DB or not DB, that is the question! ~Dispute Board (DB) for sound contract management in emerging countries~

**Takashi ITO**
Director, Japan International Cooperation Agency

**1. Poor procurement and contract management: Source of great loss.**

21st century is obviously one of the milestones for emerging countries. While most of the developed countries have been (and will probably continue) suffering from severe economic crisis or long stagnation of their national economy, emerging countries still enjoying relatively high growth. China, India and Brazil are now regular members of the top 10 list of the world largest economies. Development of national industries is widely observed and living standard of people has been improving in countries like Indonesia, Vietnam and Bangladesh. They are, however, still facing very important challenges: poverty, environment degradation, gap between rich and poor, etc.

Governments of those emerging countries make a lot of efforts to cope with their problems. Japan International Cooperation Agency (JICA) supports those governments through a various cooperation tools. It is, however, pity to see that their efforts are very often hindered by their improper procurement and contract management. Civil servants are faithful, but they sometimes overlook international practice and standard. Some domestic laws and regulations require too much transparency and procedures, which might lead to excessively cautious behavior of the stakeholders. As a result, unreasonable provisions are time to time included in the bidding documents. This often discourages international contractors from participating in the bidding. In addition, very long time is required for a bid evaluation. Slow progress of contract implementation is attributable to delay in land acquisition, long decision making process, and poor coordination among the stakeholders, insufficient budget allocation, etc. All of these factors are contributors to the loss of direct cost, claims, disputes and obstacle for appropriate resource allocation.

There exists the guiding role of FIDIC and it's Member Associations. "FIDIC's rainbow" of contract forms are widely accepted as the standard in the field of international construction contract in which the essence of the world's best practices are integrated. Significant number of training courses has been provided by FIDIC and its Member Associations, which contribute to capacity building of a wide range of people. This is the reason why JICA has strengthened collaboration with FIDIC and AJCE in the last several years. The Multilateral Development Bank (MDB) harmonized edition of FIDIC contract form for construction has been adopted in JICA's Sample Bidding Documents since 2009. A number of FIDIC training courses were organized in Asian countries under the sponsorship of JICA.

JICA has been playing a leading role to promote the Dispute Board (DB) in Asian region due to the fact that JICA can expect a lot of benefits from DB. It may prevent from and smoothly resolve disputes. It may also provide JICA's partner agencies with opportunities of capacity building through sound contract management. In spite of a lot of advantages, many partner agencies still hesitate to use DB in their own project since DB is a relatively new concept.

**2. Having done a lot, still more to do**

So, DB or not DB, that is the question. The answer**?** Of course, DB!

Since JICA decided to adopt the MDB harmonized edition in its Sample Bidding Documents for Works, various activities have

been carried out to promote the DB in JICA's partner countries. Some examples are introduced here. A number of dissemination seminars have organized in our major partner countries and a total of several hundred participants has benefitted from the seminars since 2008. An adjudicator training kit was drafted in 2010 as a tool for adjudicator training and assessment. In Dec. 2010, adjudicator training and assessment workshops were organized in Tokyo to verify effectiveness of the adjudicator training kit after which it was confirmed as satisfactory by participants, assessment panel and FIDIC. This initiative helped AJCE to be the 8th Member Association having a national list of adjudicators. Establishment of the internal policy on the use of DB in the projects funded under JICA's loans would probably be the first among the leading funding agencies in the world. It is worth noting that AJCE always stood by us during all of these initiatives and played vital roles, especially in the establishment of the AJCE list of adjudicators. Procedural rules and guidelines of AJCE list is in compliant with FIDIC adjudicator guidelines.

Now, talking about the new horizon, JICA intends to train adjudicators and help its Asian partner countries to become national list holders. One of the reasons why the DB is not widely used is that experienced adjudicators are mostly available in North America and Europe, but scarce in other regions, including Asia. Creating a national list in each country is also in line with FIDIC's policy.

Is "self-sufficiency" of adjudicators in Asia realistic**?** I am afraid not in a short period of time since those newly trained adjudicators may need some on-site experience at first. So, in the beginning, participation of well experienced experts from other regions will certainly be necessary. I hope, however, that most of adjudicators will be appointed in each region, hopefully in near future. Well, we should say we are just standing at the starting point of the long way.

**3. Yes, we can!**

Having talked much about promotion of DB, I would like to stress that this is only a part of "To do list." As mentioned in the beginning, resources can be more efficiently mobilized in the emerging countries if the procurement and contract management are sound. That is why a large number of specialists in the international funding institutions (including JICA), governments of those countries, consulting engineers and others are working in different disciplines such as public procurement, legal framework, capacity building, etc.

Jules Verne, French author, once said "Whatever a man can imagine, others will be able to realize." Well, let's say, "Yes, we can." Everyone can do something so that tomorrow is somehow better than today.

# Pathway to an attractive consulting engineering industry

**Shinichi HASEGAWA**
Director, AJCE
President, Pacific Consultants, K.K.

In order to overcome the effects of the risks of natural disasters and to improve international competitiveness, it is essential for Japan to maintain a level of social infrastructure that will support national security and safety. In the last decade, however, there has been little discussion over the necessity of social infrastructure in the consulting industry.

Following the Tohoku earthquake and tsunami on the 11th of March, 2011, the importance of well-maintained social infrastructure has increasingly been recognized for its contribution to disaster recovery and national safety.

In order to secure a greater measure of social infrastructure, it is important to convert the civil engineering sector into a more attractive industry. Consulting engineers, whose social voice has weakened in parallel with the decrease in public works, should lead this initiative.

The mission of consulting engineers is to explore the potential of human society and create valuable infrastructure through the utilization of superior technologies; in other words, to create value through the effective use of technology. Talented individuals who create value in their projects should be evaluated by their "ability to produce value within a limited timeframe", rather than by the number of hours they spend to deliver the outcome.

The term "Human Resources" refers to individuals who contribute to society. The appropriate use of talented individuals creates strong and powerful organizations; talented individuals who then go on to contribute to society. Individuals within organizations should receive quality education and then demonstrate their talents in the most appropriate jobs within the organization, thus helping to improve overall organizational operations.

The individuals who contribute to society are those with more than just "average ability". Consulting engineers who are talented can secure a sustainable future, and thereby set a standard for consultants of the next generation. Only individuals with excellent abilities can create the necessary corporate values that define a consulting firm.

Today, consulting engineers are facing many challenges. While individuals with excellent abilities are required to make the consulting industry more attractive, the industry struggles to recruit individuals.

In 1995, there were over 10,000 technical experts in the age of twenties. This number had declined to 3,000 by 2009 – therefore, in approximately 14 years, over 7,000 (equal to 72%) young individuals turned to other industries. This "shift" has caused a serious problem for the consulting engineering industry in terms of passing on technologies to future generations. It is thought that consulting engineers and engineers at large are turning away from the industry as they not filled with a sense of mission to provide values to the society through technologies.

In other words, consulting engineers are currently not in a position to promote domestic sustainable development due to unresolved issues of working conditions, such as long-working hours.

In order to fundamentally improve this situation, each individual needs to be appropriately

rewarded for the value that they create. The selection of consulting engineers must be based on their technical capacity, as well as their dedication to securing quality of project outcomes. All engineers need to become enthusiastic about creating an attractive consulting industry in order to improve business management within the company.

In October 1972, the "Brooks Act" was introduced by Jack Brooks, a member of the U.S. House of Representatives, which specified that selection of engineers should be awarded according to their qualifications and on conditions of superior technical capacity. It is noteworthy that even in the U.S. it took as long as 50 years to shift their focus from price competition to engineering competency.

It is often argued among consulting engineering firms that there is no clear link between quality assurance and consultancy business management. Some argue that low project prices have no impact on the quality of work performed, thus causing no issues for the client or for those who request their services. We need however to challenge this view and create a system where consulting engineers are evaluated based on their technical capacity. Consultants must prove that improvement in both the quality of work and organizational management can be achieved through the decreased tension in price competition, and thereby claim improvements in the current situation.

In Japan, the "Bill for Ensuring the Quality of Public Works" came into effect in 2005. With this Bill, bidding has become a mainstream of contracting method, through which 40-60% of government-led public works are commissioned to enterprises. In addition to technical component, it involves an element of price competition. While consultants must effectively react to this current status, we must consider the potential risks caused by the decrease in technology-driven forms of contract such as negotiated contracts and proposal methods.

There appears a recent trend with regard to issues of an expected price range, which defines the minimum acceptable price. As a countermeasure, we strongly believe that abolishing the upper limit of an expected price range and inter-party initiatives pursuing the special exemption law for public procurement would be beneficial. It is necessary for consulting engineers to proactively suggest fundamental reforms in contracting methods by shifting from a passive approach where they respond to the proposed contracting method to a more proactive approach by proposing business management aimed at reducing total cost including planning, design, construction, maintenance and management, thus improving overall project efficiency.

The goal is to create work places where young employees are fully satisfied and motivated, by proceeding with the improvement in the structure of consulting businesses and the work environment, taking the challenges and directions for reform into consideration. In order to achieve this, it is important for companies to make efforts to structure their organization to include appropriate highly skilled individuals rather than reallocate staff with average ability.

There are number of areas that require immediate attention including legalising the construction consultancy businesses, enriching registration systems, shifting to an engineering capacity-focused contracting method, establishing property rights on production and outcomes, establishing bilateral contracts, and shifting from contracting to commissioning.

We believe it is necessary however to work on the improvement of the social environment so that prioritising engineering-focused evaluations and improved quality of outcomes will lead to managerial reform in construction consulting companies.

# Looking forward to 2012

**Francis Kiyoshi MORIMURA**
Vice President, AJCE
President, P. T. Morimura & Associates, Ltd.

2011 was the year in which the east of Japan suffered devastation due to the earthquake and tsunami of March 11th, with a 14m wave causing disaster at the Fukushima nuclear plant and a subsequent loss of power. This gave me serious pause for thought regarding our way of thinking and our set of values. The damage caused was a blow to the pride and confidence of engineers.

These recent events call for a further rethink about our approach to engineering design and the whole concept of design. The aftermath of the disaster affords an opportunity for us to explore new ideas, to make the adoption of new engineering design approaches a reality.

I believe Japanese consulting engineers are not thinking and doing as before, but are endeavoring to meet the challenges, to come up with answers and meet the needs of society as we move forward.

Consulting engineers are searching for a new professional role to help build a safe and secure society in the face of natural disasters. And that's why I want to take this opportunity to paint a new picture of a consulting engineer's office. The time has arrived for us to review our professional role from basics.

On another note, Japan has been in a state of economic malaise ever since the collapse of the economic bubble in 1991. There still seems to be no way out of this situation, and since the earthquake there seems to have been a sense of introspection and stagnation. However, when you look outside Japan, in spite of the fact that there are fears over the world economy due to the impact of the financial crisis in Europe, as well as concerns over political situation in the Middle East and North Africa, there are reasons for optimism. Due to population increase, there is improved growth and significant increase in plant investment in Asian countries, and Japanese enterprise is making much better headway in Asia than reports in the mass media would suggest. Furthermore, while it is not clear what the impact of Japan's decision to participate in the Trans-Pacific Partnership will be on our business, I think it points towards the eventual disappearance of barriers between domestic and international, or in other words, we are moving towards a world which is without borders.

To take advantage of these opportunities I believe we should push for engineering design standards which can be understood globally, and I think we need to improve the international outlook of consulting engineers, as we turn our eyes more towards the wider world.

# Exclusions of consequential and indirect loss under English law

**Simon BARRETT**
Partner, Simmons & Simmons Gaikokuho Jimu Bengoshi Jimusho
(Gaikokuho Joint Enterprise TMI Associates)

**Introduction**

Clauses seeking to exclude (or limit) a contractor's liability for "consequential" or "indirect" loss[1] are frequently included in construction contracts as a means of reducing a contractor's liability to pay damages to an employer following a breach of contract.

In this article, we examine how the English courts have viewed such clauses (including the recent case of *McCain Foods*) and offer some practical guidance as to how parties seeking to exclude or limit liability for certain types of losses should approach the drafting of these provisions.

**Direct and indirect loss under English law**

The well-known case of *Hadley v Baxendale*[2] established the test in English law for determining what losses a party can recover following a breach of contract, and what losses cannot be recovered on the basis they are too distant or, to use the legal terminology, too "remote".

The test divides losses into two categories:

(a) "Direct" losses that arise naturally from a particular breach; and

(b) "Indirect" losses that are not a natural consequence of the breach but which instead arise out of special or unusual circumstances.

While direct damages are recoverable in full, indirect losses can only be recovered if both parties knew about the special or unusual circumstances at the time they entered into the contract.

The case of *Victoria Laundry*[3] helpfully illustrates this distinction. Here, late delivery of a boiler resulted in a laundry suffering losses, including lost revenue under certain lucrative government contracts. The court ruled that the revenue lost under the government contracts was indirect on the basis it was an exceptional loss that would not normally arise from delayed delivery. Accordingly, since the supplier had not been told of the existence of the government contracts such lost revenue was not recoverable.

**The English courts' approach to exclusion clauses**

In cases like *Victoria Laundry* the English courts have been able to distinguish between direct and indirect losses when considering questions surrounding remoteness of damages. However, courts have struggled to identify "indirect" losses in the context of an exclusion or limitation clause.

Indeed, in every case to have come before the English Court of Appeal and in which a party has attempted to invoke a general exclusion or limitation of indirect loss, the court has viewed the loss in question as being direct loss and therefore outside the scope of exclusion or limitation.[4]

**The decision in McCain Foods**

This conclusion was again reached in the recent High Court decision of *McCain Foods GB Limited v Eco-Tec (Europe) Limited*[5]. In this case, an employer, McCain Foods, purchased from a contractor, Eco-Tec, a system that was designed to remove certain chemicals from biogas produced by McCain Food's waste water treatment plant. The clean biogas was then to be used both as fuel to generate electricity and as a source of revenue though the sale of renewable energy certificates.

The employer, however, encountered problems commissioning and operating the system. It brought a claim against the contractor for damages for breach of contract, including the cost of buying a replacement system, the additional cost of having to buy electricity instead of generating it from the biogas and the loss of revenue from selling the renewable energy certificates.

The contractor accepted its liability to pay damages in respect of the costs of the replacement system but challenged the remaining claims for damages on the basis that these losses fell within an exclusion clause in the construction contract, which stated that the contractor's liability for "indirect, special, incidental and consequential damages" was excluded.

However, the High Court held that all types of loss claimed arose directly from the contractor's breach, and were not therefore indirect or consequential. The claimant could recover damages in respect of the cost of replacement equipment, the extra cost of electricity (as McCain Foods could not generate its own), extra contractor costs and the loss of revenue from the sale of the renewable energy certificates.

**Advice on drafting**

The above suggests that a general exclusion or limitation of consequential or indirect loss is unlikely to reduce a party's liability following a contractual breach. Accordingly, if the parties choose to exclude or limit certain types of losses when they enter into a contract, clear words describing those precise losses needs to be used.

The types of losses that parties may wish to exclude in a construction contract will obviously vary, however the following are the kind of losses that parties may want to make provision for in their agreements.

- Loss of profit
- Loss of revenue
- Loss of production
- Loss of opportunity
- Loss of access to markets
- Loss of overheads
- Loss of goodwill
- Loss of use
- Loss of any benefit arising under a contract with a third party
- Damage to property

Please feel free to contact Simon Barrett with any questions you may have on this topic.
simon.barrett@simmons-simmons.com

1. Terms such as "consequential loss", "indirect loss", "special loss" and "incidental loss" are broadly given to mean the same thing under English law and are therefore treated together in this article.
2. (1854) 9 Exch 341
3. *Victoria Laundry (Windsor) Ltd v Newman Industries Ltd* [1949] 2 KB 528
4. See for instance *Croudace Construction v Cawoods Concrete Products Ltd* (1978) 8 BLR 20; *British Sugar plc v NEI Power Projects and Another* (1998) 87 B.L.R. 42 CA; *Deepak Fertilisers v ICI* [1999] 1 Lloyd's Rep. 387; and *Hotel Services (UK) Ltd. V Hilton International Hotels UK Ltd* (2000).
5. [2011] EWHC 66 (TCC)

# AJCE Activity 2011 at a glance

## January

**AJCE New Year Celebration Party**


## JulySeptember

**AJCE Annual Seminar 【see p.15 】**
**- Consulting Services Contract in Overseas Project -**

## October

**FIDIC 2011 Davos Conference**
**- Local Resources-Global Perspectives**

## November

**Reporting Seminar,**
**FIDIC 2011 Davos Conference**

### "Yakai", Social Networking Event
【see p.19】

### AJCE Seminar
### FIDIC Conditions of Contract for Construction, MDB Harmonised Edition
【see p.17】


## *December*

### Introduction of CE Industry to University Students
【see p.19】

### Professional Career Development Seminar

AJCE Activity 2011

# AJCE Annual Seminar 2011

## Consulting Services Contract in Overseas Project - FIDIC White Book and the AJCE List of Adjudicators -

Professional Development Committee, AJCE

**1. Introduction**

AJCE held its annual seminar under the theme of "Consulting Services Contract in Overseas Project -FIDIC White Book and the AJCE List of Adjudicators-" in Tokyo on 12 July 2011. In the early part of the seminar, speakers explained about the "Client/Consultant Model Services Agreement" of FIDIC, "White Book", which is FIDIC's standard form of contract focusing on contracts between the client and consulting engineers (CEs). In the latter part, the AJCE List of Adjudicators was introduced.

**2. Presentations**

**1) CEs' Role under the Contract (Mr. Yukinobu Hayashi)**

Mr. Hayashi first explained that CEs owe no other responsibility than that to exercise reasonable skill, care and diligence under the White Book and are required to stand independently between the client and the contractor. It was explained that the major roles of CEs are: approval of documents submitted by the contractors; project management; issuance of certifications; and issuance of a 'determination' in order to settle claims that have been made. It is important for CEs to clarify the following in signing a contract: ambiguities in the TOR; extent of liability for damages; coverage of insurance; process for contract amendment; conditions for payment; and dispute settlement measures.

**2) Interpretation of the White Book 2006 (Mr. Takaharu Kaburaki)**

Mr. Kaburaki, who has worked overseas for many years as a CE and a construction company employee, carefully interpreted the White Book by making reference to the sample bidding documents of JICA. Under the White Book, he explains: CEs are liable for only those damages demanded in a set period of time and only when the breach of contract has been established by the counterparty; the level of compensation does not exceed the amount of damage that is reasonably foreseeable; and such clauses are not provided by JICA. Further, copyright of the reports prepared by CEs belongs to CEs under the White Book but to the client under JICA's contract.

**3) Client-CE Contract and CE's Responsibility (Ms. Toshiko Koizumi)**

Ms. Koizumi explained from a lawyer's view point that in recent years, CEs have been held responsible for illegal actions, particularly those concerned with environmental damages, beyond the level stipulated in the contract. Touching on past cases in Indonesia, Vietnam, and Nigeria, she explained that project undertaken over 10 years ago can still be subject to a lawsuit and hence it is important to keep records. She also pointed out that there exists no contractual relationship between CEs and contractors and therefore in case legal claims were made for damages between them, it could lead directly to a lawsuit. In signing a contract, she stressed that the following issues should be clarified: definitions of regular, additional, and special services; contract period; defect liability period; conditions and process for contract

extension; and scope and level of CE's support to be provided to the employer after the project.

**4) Dispute Board and CEs (Dr. Toshihiko Omoto)**

Dr. Omoto, one of the FIDIC President's List of Approved Adjudicators, explained that standing DB consists of three adjudicators who are versed in apprehending contracts and have rich professional experience in dispute resolution in overseas projects. It was explained that DB's role was to support the efforts made by parties concerned to solve the disputes and that DB does not provide technical advices as the engineers do. He added that DB contributes to preventing disputes and introduced some of the claimed shortcomings as: increase in cost and burden of aid-recipient countries; and its duplicative role with the engineers.

**5) Introduction of the AJCE List of Adjudicators (Mr. Hidenori Nozaki)**

Mr. Nozaki explained that, in response to a growing demand for adjudicators, FIDIC has been requesting its member associations including AJCE to select adjudicators by themselves and that was a reason behind AJCE commencing operation of the AJCE List of Adjudicators in May 2011. He reported that 10 members have been qualified to be on the list and encouraged participants to apply for adjudicator assessment (examination). He explained the conditions to apply and to be accredited as an adjudicator as well as the process of examination, screening, and registration.

**3. Closing Comments**

It is an honor to have invited qualified experts with relevant backgrounds. We are confident that the information and expertise shared have helped all participants gain confidence in stepping out into the challenging sphere of overseas business.

AJCE Activity 2011

# AJCE Seminar

## FIDIC Conditions of Contract for Construction, MDB Harmonised Edition (Harmonised Red Book)

International Activity Committee

### 1. Introduction

Conditions of Contract for Works of Civil Engineering Construction (1987 Red Book), published by the International Federation of Consulting Engineers (FIDIC), was entirely revised to Conditions of Contract for Construction for Building and Engineering Works Designed by the Employer (1999 Red Book). The 1999 Red Book has been revised further for projects funded by Multilateral Development Banks (MDB ). This is the Harmonised Red Book.

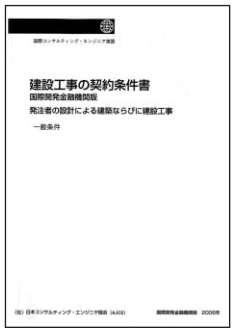
On the other hand, Sample Bidding Documents (SBD) under Japanese ODA Loan, Procurement of Works, Japan International Corporation Agency (JICA) had specified the general condition of1987 Red Book in its SBD. Further in June 2009, the SBD was revised and the Harmonised Red Book was built into the revised SBD. In recent years JICA is making efforts in Japan to increase the number of adjudicator who will be a member of Dispute Board (DB) that prevents dispute as well as to make a decision on a dispute as specified in the Harmonised Red Book.

Under such circumstances, Contract Sub-committee (CCSC), International Activity Committee, AJCE have worked on a comparative study regarding clauses in the 1987 Red Book versus those in 1999 / Harmonised Red Book since January 2009. In connection with this study, CCSC has started to translate the Harmonaised Red Book in Japanese in December 2009, and published the Japanese edition in August 2011.

Hamonised Red Book


2010 Edition

2006 Edition




2006 Edition (Japanese)

Based on the results of work carried out by the CCSC, seminar for explaining differences between the Harmonised Red Book and the 1987 Red Book was held in which views on contract management was also explained.

### 2. Seminar Presentations

(1) Seminar Outline (Mr. Ryota Fujiwara, Chairman of CCSC)

Prior to the seminar, overview of the clauses and comparative briefing regarding the Red Book

and its Harmonised edition was presented. In addition, characteristics of the Harmonised Red Book were briefed in the following three points: 1) Role of the Engineer, 2) Dispute Board and relation among the parties and 3) Persons including MDB.

(2) Part-1: Clause 1 - 5 (Mr. Kunji Akinaga, Mr. Motohiko Iijima, CCSC)
Part-1 includes general provisions and matters regarding the Parties and Persons under the Harmonised Red Book (Employer, Engineer, Contractor, Nominated Subcontractors)

(3) Part-2: Clause 6 - 14 (Mr. Takaharu Kaburaki, Mr. Masamichi Watanabe, CCSC)
Part-2 stipulates matters regarding manpower resources (staff and labour), physical resources (plant and material) and workmanship, and of process from commencement of works to taking over.

(4) Part-3: Clause 15 - 19 (Mr. Hidekazu Konishi, Mr. Tatsuro Hayashi, CCSC)
Part-3 consists of clauses about termination, suspension, risk, insurance and force majeure. They are fundamental factors for a contractor to decide whether he submit a tender.

(5) Part-4: Clause 20 and Appendix (Mr. Takashi Hara, Mr. Hiromi Hoshi, CCSC)
Part-4 consists of matters on disputes and arbitration. In the Appendix, general conditions of Dispute Board agreement is stipulated .

**3. Question and Answer**
Questions were raised on "Employer's Financial Arrangements" and "Eligible Source Country". Also interpretation of clauses was discussed.

**4. Conclusion**
This seminar was aimed at contract engineers and persons who have experience of contract management. It might be difficult to understand for persons not familiar with contract conditions like Red Book.
Needless to say that it is one of the important skills for consulting engineers to manage conditions of contract for construction because the last stage of social infrastructure establishment is "construction".
AJCE wishes that seminars of contract management like this will help the AJCE member firms as well as concerned parties for more overseas business expansion in engineering and construction field.

AJCE Activity 2011

# Activity of Young Professionals in 2011

**Kazutoshi AKASAKA**
Chair, Young Professionals Sub-Committee, AJCE
Nihon Suido Consultants Co.,Ltd.

**Topic 1: Activities of YP sub-committee**
The Young Professionals (YP) activities include:
- Support training and networking of young engineers through the participation to FIDIC/ASPAC activities
- Promote young consulting engineers' skills to be competent in the international market
- Promote the participation of young engineers in Consulting Industry including students.

**Topic 2: "Yakai", Social Networking Event**
On 22 July 2011, an YP social networking event was organized and hosted by AJCE YP SC. About 40 YPs from several companies participated and enjoyed communication among them. This event provided opportunity to disseminate activity of AJCE YPs.

**Topic 3: Contribution to FIDIC YPF and ASPAC YPF**
A member of AJCE YP SC is serving as FIDIC YPF SC and ASPAC YPF SC member. We would like to continue positive contribution to FIDIC YPF activities by sending representative from AJCE.

In the FIDIC conference 2011, Mr. Imai presented the following subjects:
- Introduction of several cases on YP's skill development in several companies
- Proposal on expected training method of YP
- Introduction of YP activities


**Topic5: Introduction of CE Industry to University Students**
YP SC conducted lectures on CE industry and role of consultants for University Students.
The lectures were held in Shibaura Institute of Technology on 11 November 2011 and Tokyo metropolitan university on 7 December 2011. Students participated the lectures were about 30 and 60 respectively.
Seven of YP SC members lectured on specialized field of practices. This event will be carried out continuously.

**Topic6: New Activity**
In addition to the above activities, YP SC is planning to carry out the YP Award for the outstanding activity by YPs in this year. This activity will continue,

Project Accomplishments by AJCE Members

# URGENT DISASTER REDUCTION PROJECT FOR MT. MERAPI, PROGO RIVER BASIN

**Principal Firm(s)** Yachiyo Engineering Co.,LTD

**Project Site** North of Yogyakarta City, central Java, Indonesia

**Client** Ministry of Public Works, Indonesia

**Finance** Japanese ODA Loan

**Period** Aug 2006 - June 2012

**Type of Project** Engineering Consulting Services for PQ, Tender and Construction Supervision

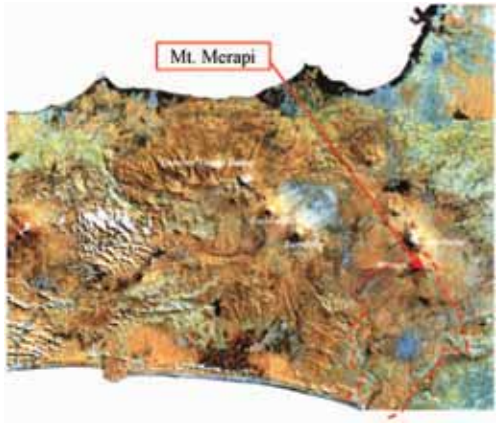
**Project Outline**

Indonesia is characterized as a volcanic country, having 129 volcanoes equivalent to 16% of the world total. Among them, Mt. Merapi, one of the most active volcanos in the world, is located 30km north of Yogyakarta City, central Java. Previous eruptions and subsequent debris flows have caused frequent sediment disasters, resulting in human victims and damage or destruction of private and public assets. To mitigate sediment disaster along the area, the Government of Indonesia has started Mt. Merapi and Mr. Semeru Volcanic Disaster Countermeasures Project using the Japan's ODA Loan. The main objective of the Project is to mitigate and control the volcanic sediment disaster by construction of the sediment control facilities such as check dams, consolidation dams, training dikes, revetment and channel works.

**Details**

Structural Measure
- Construction Works of Sabo Facilities in Merapi Area
  Sabo Dam : 36 locations
- Rehabilitation Irrigation Facilities
  Irrigation facility : 15 locations
- Construction Groundsill for riverbed degradation measure
  Groundsill : 3 locations
- Construction of Evacuation Facility
  Shelter : 3 locations
  Evacuation road : 5.7 km
- Installation of Monitoring, Forecasting and Warning system
  Warning system station : 12 stations
- Construction of Workshop for Equipment of Disaster Emergency Works
  Workshop : 1 location

Non-structural Measure
- Establishment of warning and evacuation system
- Sand Mining Control




Location of the project site in Java island, Indonesia

2010 Mt. Merapi Eruption (November 5, 2010)

Pyroclastic Flow Deposit (November 5, 2010 Gendol River)

Sabo Dam in Apu River (AP-RD1a)

Sabo Dam in Putih River (PU-RD5)

Sabo Dam in Trising River (TR-RD8)

Shelter in Kepuharjo Village

Project Accomplishments by AJCE Members

# Maritime Education and Training Improvement (METI) Project

**Principal Firm(s)** Oriental Consultants Co., Ltd
ORICONSUL

**Project Site** Jakarta/ Semarang / Surabaya / Makassar / Barombong

**Client** Human Resource Development Agency, Ministry of Transportation, Indonesia

**Finance** Japanese ODA Loan

**Period** May 2004 - May 2011

**Type of Project**
◆ Education / Human Resource Development

**Project Outline**
As a member country in the International Marine Organization (IMO), the maritime sector in Indonesia has been open to global competition since FY 2000 White List and realized needs have "Implementation of modernization of Indonesia's merchant maritime education through improvement of education programs, enhancement of trainers' capability and establishment of indispensable equipment".
In order to meet with qualification requirement of STCW'95 (The International Convention on Standards of Training, Certification and Watchkeeping for Seafarers) of IMO, METI project provides with procurement of upgrading MET (marine education and training) Equipment together with building construction and Education/Training Program to the 6 MET Institutes of ETA (Education and Training Agency) which Ministry of Transportations supervised, entered into agreement with both Government of Indonesia and Japan in 2001. Significant MET equipment developed is integrated full mission ship simulator equipment which is combined with 3 types of ship maneuvering simulators, full mission engine room simulator and real diesel engine plant. Simulators and the plant work were allocated into the bridge, engine control room and engine room as if in a real ship through the interface, which transfers the needed information to required sections.
Seafarer training at each Institute is now on track after the project completed in 2010, resulting in quantity and quality improvement for seafarers with state-of-the-art marine equipment and technology which will update their COC (Certificate of Competency) into the new standard STCW'95 to promote safety of life and property at sea and protection of marine environment, providing qualified seafarers to the market complying with demands of domestic and international fleets in marine sector, especially in Indonesia.

**Details**
◆ Services Provided
Basic design study, detailed Design, tender document, assistance for tender evaluation, contract administration, and construction / procurement supervision.

◆ Service Recipient 6 (six) Institutes in Indonesia
BP3IP Jakarta/ STIP Jakarta / PIP Semarang & Makassar
BP2IP Surabaya & Barombong
◆ Outline of Major MET Equipment Provided
1. Radar /ARPA Simulator
2. Full Mission Ship Simulator
3. Full Mission Cargo Handling & LNG Simulator
4. GMDSS Simulator


BP3IP Jakarta


Ship Maneuvering Simulator Room


Engine Room Simulator: BP3IP


Real Diesel Engine Plant and
Lobby Atrium: BP3IP Jakarta

Project Accomplishments by AJCE Members

# Southern Transport Development Project (Southern Expressway; JICA funded section)

**Principal Firm(s)** Oriental Consultants Co., Ltd. and JBSI with RDC

ORICONSUL

**Project Site** South West Region of Sri Lanka

**Client** Road Development Authority, Sri Lanka

**Finance** Japanese ODA Loan

**Period** July 2002 - Feb2013
Operated since 27/Nov/2011

**Type of Project**
- ◆ Detailed Design
- ◆ Tender Assistance
- ◆ Construction Supervision







**Project Outline**

Southern Transport Development Project (STDP) is the first fully access-controlled Expressway in Sri Lanka. The whole length of STDP is 126km and JICA section is 66km. It starts at Kottawa (Colombo) and ends at Godagama (Matara). It will ease the traffic congestion in Galle Road, provide more convenient transport facilities for residents in the South and finally stimulate the economic development in Sri Lanka and South Regions. The highway is a 4-lane dual toll expressway in a 6-lane wide excavated road corridor for the future expansion, including 4 interchanges. The route traverses through flood plain and marshy ground consisting of very soft peat, organic soils and clays, occupying 42% of JICA section length. Besides the supervision work, the functional detailed design & the bid preparation for Toll Collection System (T&G and ETC) and also the detailed design & supervision work for Toll Office & Toll Gate for 8 interchanges including ADB funded section (30km) were carried out.

**Details**

- ◆ Earth Work: 6,200,000$m^3$(Cut), 7,500,000$m^3$(Fill)
- ◆ Soft Ground Treatment(28km):
  CVC, Heavy Tamping, Band Drain, rock replacement
- ◆ Bridge: 695m and 310m long bridge by Dywidag
  Other 51 PC beam bridges
- ◆ Structures: 199 box culverts, 234 pipe culvert
- ◆ Pavement:
  190,000ton asphalt for binder course(60mm)
  130,000ton asphalt for wearing course(40mm)

Project Accomplishments by AJCE Members

# THE PROGRAMME FOR FOREST INFORMATION MANAGEMENT

**Principal Firm(s)** KOKUSAI KOGYO CO., LTD.

KOKUSAI KOGYO CO., LTD.

**Project Site** Vientiane Capital, LAO PDR

**Client**
1) Procurement Agent: JICS
2) Implementing Organization: Department of Forestry, the Ministry of Agriculture and Forestry, Lao PDR

**Finance** Japan's Grant Aid

**Period** Construction: Sep. 2010 - Sep. 2011

**Type of Project**
1) Facility Construction
2) Equipment Procurement
3) Technical Assistance

**Project Outline**

Laos has formulated a plan to restore its forestation rate to 70% by 2020. It has also been establishing and revising forest related laws and passing legislation regarding village forestry management. Furthermore, it has seized on the Reducing Emissions from Deforestation and Forest Degradation programme (REDD) to combat global warming. Moreover, Laos pronounced its participation in the Forest Carbon Partnership Facility (FCPF), and was selected as one of the initial 14 participant countries. The government intends to promote forest conservation through the formulation and implementation of a plan to prepare a REDD system, and through experimental emissions trading and so on.

This Programme's overall goal is to prepare benchmark maps for REDD based on forest resources information so that the prevention of deforestation is dealt with globally; and the purpose of the Programme is to establish a fundamental structure to make basic forestry maps using several types of satellite imagery in Laos.

**Details**

1) Facility Construction
   - Computer room
   - Multipurpose meeting room
   - Data server room
   - Library / documents storage
   - Administration office
2) Equipment Procurement
   - Equipment for satellite imagery analyses and database construction
   - Equipment for sampling site surveys
3) Technical Assistance
   - Satellite imagery analyses
   - Field surveys
   - Development/management of a basic database on forestry

Project Accomplishments by AJCE Members

# The Project for Management of Non-Revenue Water in Kenya (1st FY)

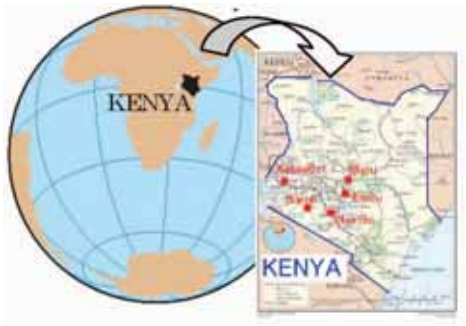
| | |
|---|---|
| **Principal Firm(s)** | Chuo Kaihatsu Corporation<br>CKC |
| **Project Site** | Nairobi/Meru/Embu/ Narok/Kapsabet, KENYA |
| **Client** | Ministry of Water and Irrigation of Kenya etc. |
| **Finance** | Technical Cooperation Projects of Japan |
| **Period** | September 2010 - June 2011 |
| **Type of Project** | Project Management Services |

**Project Outline**
The reduction of Non-Revenue Water (NRW) is a cost effective method and it is Kenyan government's aim to reduce the current national rate of NRW of 60% to 30% by year 2015. The Ministry of Water and Irrigation of Kenya has approached the Japanese Government for assistance in view to achieve its goals of NRW reduction, reducing its running costs and implementing effective water use.

What is Non-Revenue Water?
NRW is the difference between the volume of water put into a water distribution system and the volume that is billed to customers. NRW comprises three components: physical (or real) losses, commercial (or apparent) losses, and unbilled authorized consumption. [World Bank]

**Details**
◆ Project Purpose:
System and mechanisms for reducing NRW in Kenya are set up and the implementation capacity is developed.
◆ Indicators:
1. Kenya Water Institute conducts training for NRW reduction based on the human resource development plan.
2. The 8 Water Service Boards to prepare dissemination plan for NRW reduction.
3. NRW data from all Water Services Providers is utilized for summarize the annual report by Water Services Regulatory Board.

◆ Project Output
4. Manual/Guideline of NRW reduction is made through the pilot projects implementation.
5. "The Standard of NRW Management" is authorized and Water Service Regulatory Board strengthens capacity to lead Water Service Boards and Water Services Providers to reduce NRW.
6. Kenya Water Institute develops their capacity of training for NRW reduction measures.
7. "The Standard of NRW Management" is spread out nationwide.




Project Accomplishments by AJCE Members

# THE PROJECT FOR CONSTRUCTION OF BRIDGES ON BOUGAINVILLE COASTAL TRUNK ROAD

**Principal Firm(s)** CHODAI CO., LTD.

**Project Site** Bougainville Island

**Client** The Independent State of Papua New Guinea

**Finance** Grant Aid of Japan

**Period** October 2009 - March 2012

**Type of Project** Consultant Supervision Services

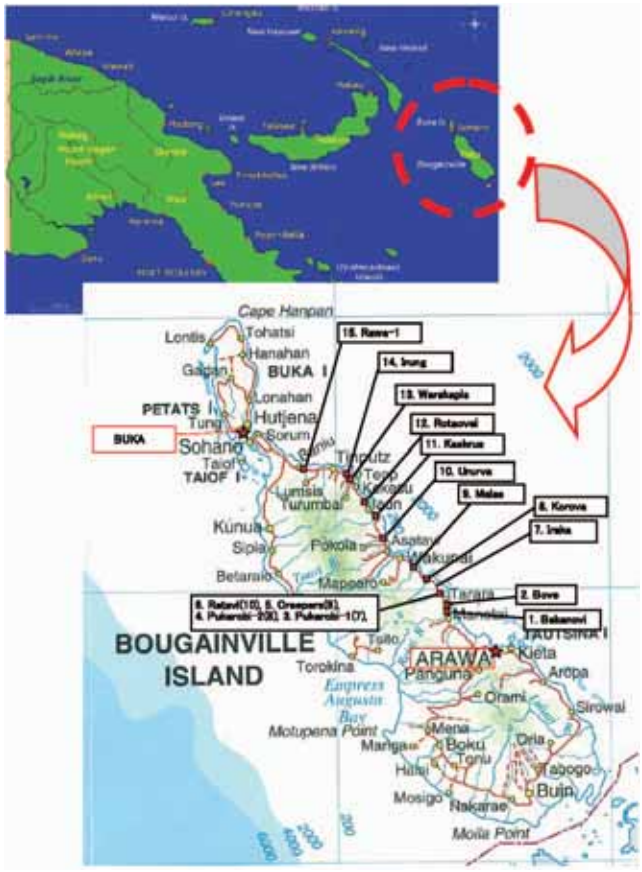
**Project Outline**

Although the Bougainville Coastal Trunk Road is the most important road in the Island, majority of the road facilities including bridges and causeways have been severely deteriorated due to the lack of maintenance activities during and after the hard years of the internal conflict. Many of the causeways on the road were collapsed or washed away by heavy flood water and causeways at 15 locations where the traffic were interrupted by flood water are selected to be reconstructed. All weather transportation on the road will be secured and the development and stability of the local people's life in the Island will be promoted by the Project.

**Details**

The total number of construction is 15 bridges. The scope of the work is summarized below.

| Number of Bridge | Foundation Type | Structure Type | Others |
|---|---|---|---|
| 2 | Steel pipe pile | 3 Span steel girder Bridge L=75m | Approach road Gabion,Sodding |
| 2 | Steel pipe pile | 2 Span steel girder Bridge L=50m | Approach road Gabion,Sodding |
| 3 | Spread foundation | 2 Span steel girder Bridge L=40m | Approach road Gabion,Sodding |
| 3 | Steel pipe pile Spread foundation | 1 Span steel girder Bridge L=25m | Approach road Gabion,Sodding |
| 5 | Steel pipe pile Spread foundation | 1 Span steel girder Bridge L=20m | Approach road Gabion,Sodding |




## Project Accomplishments by AJCE Members

# CONSULTING SERVICES FOR THE PROJECT FOR CONSTRUCTION AND REHABILITATION OF BRIDGES ON MAIN ROADS IN JUBA CITY IN THE REPUBLIC OF SOUTH SUDAN

**Principal Firm(s)** CTI Engineering International Co., Ltd.

**Project Site** Juba, Republic of South Sudan

**Client** Ministry of Roads and Bridges, Republic of South Sudan

**Finance** Grant Aid, Japan

**Period** Feb. 2010 - Dec. 2011

**Type of Project** Design and Construction Supervision

**Project Outline**

In response to the request from the government of South Sudan to the government of Japan, CTI Engineering International Co., Ltd. carried out services under Japan's grant aid for conflict prevention and peace building. The project is formulated for six bridge locations with the objective of improving mobility and accessibility within Juba by providing fix links in places where roads cross rivers and streams, making the roads accessible throughout the year. The Project construction started in February 2010 and it was completed in December 2011. The project aims to attain the following benefits:

- Lifeline to key supply routes for foods and goods from Uganda, Kenya to Juba, South Sudan.
- Link to major roads network in all weather conditions in the capital city Juba.
- Infrastructure to economic development and social stability in South Sudan after independence.

**Details**

The Project includes construction of bridges No. 6, 9, 12 and culverts No. 13, 14, 15.

| No. | Name of Bridges/ Culverts | Dimension | | Type of Structure |
|---|---|---|---|---|
| | | Length (M) | Width (M) | |
| 1 | Bridge No. 6 | 24 | 20 | RCDG Two Span |
| 2 | Bridge No. 9 | 14 | 23 | RCDG Single Span |
| 3 | Bridge No. 12 | 18 | 24 | RCDG Single Span |
| 4 | Box Culvert No. 13 | 5 | 21 | RCBC Single Barrel |
| 5 | Box Culvert No. 14 | 4 | 20 | RCBC Single Barrel |
| 6 | Box Culvert No. 15 | 8 | 20 | RCBC Double Barrel |


Mudarat Bridge - Old and narrow bridge (Before the Project)


Mudarat Bridge (N0.6) - After Completion


Korbou Bridge- Overflow during heavy rain (Before the Project)


Korbou Bridge (No.9) - After Completion


Munuki Bridge - Overflow during heavy rain (Before the Project)


Munuki Bridge (No.12) - After Completion


Culvert No.13 - Flooded during heavy rain (Before the Project)


Culvert No.13 - After Completion


Culvert No.14 - Flooded during heavy rain (Before the Project)


Culvert No.14 - After Completion


Culvert No.15 - Flooded during heavy rain (Before the Project)


Culvert No.15 - After Completion

Project Accomplishments by AJCE Members

# The Capacity Development Project for Non-Revenue Water Reduction in Colombo City, Democratic Socialist Republic of Sri Lanka (1st Project Year)

**Principal Firm(s)** Nihon Suido Consultants Co., Ltd.
Nihon Suido Consultants Co., Ltd. Water and Environmental Consultants

**Project Site** Colombo, Sri Lanka

**Client** Japan International Cooperation Agency (JICA)

**Finance** JICA

**Period** Oct 2009 - Mar 2011

**Type of Project** ◆ Technical Cooperation

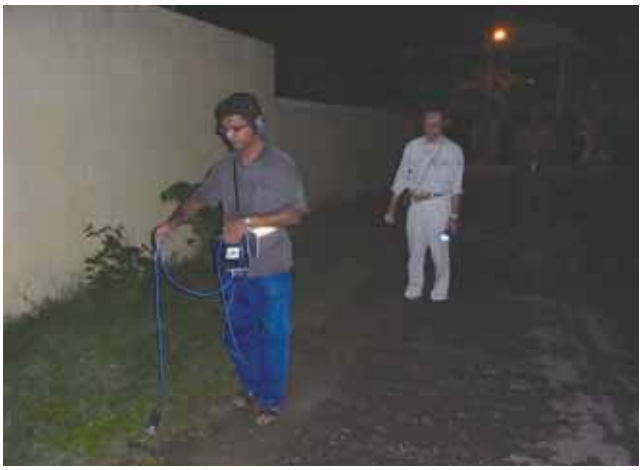
**Project Outline**
The Project aims to enhance capacity of staff who are working for NRW reduction in National Water Supply & Drainage (NWSDB) that is in charge of water supply and sewage sector in Sri Lanka. Following outputs are expected in the Project.

1 Management capacity of senior officers of Regional Center (Western-Central) to plan and supervise NRW reduction activities is enhanced.
2 Technical and operational capacity to conduct NRW reduction activities by officers/staff of Western-Central Regional Center is developed.

**Details**
This project is divided into 3 phases, namely 1st Project Year (Oct/2009 to Mar/2011), 2nd Project Year (Apr/2011 to Mar/2012) and 3rd Project Year (Apr/2012 to Oct/2012). Following activities are included in this project.

◆ Review existing plan and training program on NRW reduction.
◆ Prepare/review an annual program for NRW reduction activities.
◆ Assess progress of NRW reduction activities in the pilot areas.
◆ Prepare a NRW reduction work plan to be conducted in a pilot area.
◆ Review and modify existing pipeline network drawings of the pilot areas for the NRW reduction activities.
◆ Conduct OJT on isolation work, leak detection, plumbing and pipe repairing.
◆ Implement NRW reduction activities according to the work plan.
◆ Prepare future policy to rollout NRW reduction activities to the entire area of Colombo City.


Preparation survey with the counterpart


OJT for leak detection in a pilot area

Project Accomplishments by AJCE Members

# Preparatory Survey on Sewerage System Development Project III in The Kingdom of Morocco

**Principal Firm(s)** Nihon Suido Consultants Co., Ltd.

Nihon Suido Consultants Co., Ltd.
Water and Environmental Consultants

**Project Site** The Kingdom of Morocco

**Client** Japan International Cooperation Agency (JICA)

**Finance** JICA

**Period** July 2011 - Feb 2012

**Type of Project** ◆ Preparatory Survey

**Project Outline**

- to increase the overall connection rate to sewerage system in 9 cities (Bouarfa, Nador, Targuist, Essaouira, Berkane, Al Aroui, Taourirt, Ouarzazate, and M'rirt)
- to increase sewage treatment capacity and reduce pollution in the natural environment
- to strengthen the capacity building for sewerage management and O&M activities
- to determine how ODA loans for reduction of climate change impacts can be applied to this project

**Details**

◆ In order to facilitate ODA loan project formation smoothly, the existing systems and proposed plans were reviewed, and feasibility study (F/S) reports for the development of sewerage in 9 cities were prepared.

◆ The greenhouse gas (GHG) reduction was studied based on CDM (Clean Development Mechanism) approach. Covers for anaerobic ponds and flaring methane gas were proposed.

◆ Treatment processes were selected from aerated lagoon process to $A_2O$ process based on local conditions such as effluent quality, land availability, and costs.

◆ Stakeholder meeting was held to create a better understanding of the project, obtain feedback from stakeholders, and ensure transparency.

**Summary of Project Components**

| | |
|---|---|
| Target Year | 2025 |
| Expansion of STP | 9 cities |
| Expansion and Rehabilitation of Sewer | 8 cities (Nador, Targuist, Essaouira, Berkane, Al Aroui, Taourirt, Ouarzazate, and M'rirt) |
| Drainage Expansion | 4 cities (Targuist, Essaouira, Taourirt, and M'rirt) |
| Cover of Anaerobic Ponds for GHG Reduction | 8 cities (Bouarfa, Targuist, Essaouira, Berkane, Al Aroui, Taourirt, Ouarzazate, and M'rirt) |


Project Sites

Photo of Stakeholder Meeting

Project Accomplishments by AJCE Members

# Sihanoukville Port Special Economic Zone Development Project

| | |
|---|---|
| **Principal Firm(s)** | Nippon Koei Co., Ltd. NIPPON KOEI |
| **Project Site** | Adjoining the Sihanoukville Autonomous Port in Cambodia |
| **Client** | Port Authority of Sihanoukville (PAS) |
| **Finance** | JICA Loan |
| **Period** | October 2009 - March 2012 |
| **Type of Project** | Consulting Services for Construction Supervision, Operation &Promotion |


**Project Outline**

Cambodia currently experiences rapid economic growth. One factor is industrial development with foreign direct investment. The leading industries are garment and foot wear. However, it is considered, because of too much dependence on such traditional industries, that the Cambodian industry has to be diversified and upgraded.

By the strategic location of the Sihanoukville Port, the Project is expected to be a base for attracting non-traditional industries, especially export-oriented industries. As well, the Project is specialized to develop a Special Economic Zone (SEZ) in direct connection with the Port, and aims to facilitate Foreign Direct Investment to the area and create new employment opportunities for the people and contribute to further economic growth of the Kingdom of Cambodia.

**Details**

(1) Infrastructure of SP SEZ : Road, Water supply system, Waste water collection and treatment system, Power supply system, Telecommunication system

(2) Special facilities of SP SEZ : SEZ Center, Container freight station, Direct connection gate with Port, Dormitories and Service Apartment for Investors' employee

Project Accomplishments by AJCE Members

# The Project for Introduction of Clean Energy by Solar Electricity Generation System (3 Projects: in Mongolia, Nepal, and Pakistan)

**Principal Firm(s)** Nippon Koei Co., Ltd.

NIPPON KOEI

**Project Site**
1. Ulaanbaatar, Mongolia
2. Kathmandu, Nepal
3. Islamabad, Islamic Republic of Pakistan

**Client** Japan International Cooperation System (JICS) on behalf of the Governments of Recipient Countries

**Finance** Grant Aid, Japan

**Period**
1. April 2010 - March 2012
2. August 2010 - April 2012
3. Sept. 2010 - March 2012

**Type of Project** Japan's Programme Grant Aid for Environment and Climate Change

**Project Outline**

In 2008, Japan established the Cool Earth Partnership, which is a framework of the activity to contribute to climate stability by supporting developing countries that are aiming to achieve both Green House Gas (GHG) emission reductions and economic growth.

In the framework, these projects provide grid-connected Photovoltaic (PV) generation system to promote mitigation of GHG emission by enhancing awareness of the PV system and building technical experience on PV system.

**Details**

1. Project in Mongolia
   - 426 kW PV generation system
   - Grid connection with 6.3 kV line
2. Project in Nepal
   - 680 kW PV generation system
   - Grid connection with 11 kV line
3. Project in Islamic Republic of Pakistan
   - Two project sites
   - 178 kW PV generation system in each site (356 kW in total)
   - Grid connection with 400 V line

**1. Project in Mongolia**

Bird's-eye View

PV Module

**2. Project in Nepal**

Bird's-eye View

PV Module

**3. Project in Islamic Republic of Pakistan**

Project Site-1: Pakistan Engineering Council

Project Site-2: Planning Commission

Project Accomplishments by AJCE Members

# Kerala Water Supply Project

| | |
|---|---|
| **Principal Firm(s)** | Tokyo Engineering Consultants Co., Ltd. |
| **Project Site** | Construction of five independent Water Supply Systems to 5 districts of Kerala State and Institutional Strengthening of Kerala Water Authority in the Republic of India. |
| **Client** | Government of Kerala |
| **Finance** | ODA Loan of Japan |
| **Period** | Sep 2003 - Mar 2013 |
| **Type of Project** | ◆ Detailed Engineering Design<br>◆ Construction Supervision<br>◆ Project Management Services |

**Project Outline**

In line with Government of India's goal of providing safe and adequate drinking water to all the urban and rural people, Kerala Water Supply Project was formulated in order to construct water supply systems to five districts of Kerala covering a total population of 4.1 million.

The project aimed to augment and rehabilitate the water supply facilities in two urban regions namely, Thiruvananthapuram and Kozhikode city regions and a new construction of water supply systems to three rural areas namely in Meenad (Kollam district), Cherthala (Alappuzha district) and Pattuvam (Kannur District).

The Project also includes overall institutional strengthening of Kerala Water Authority (KWA) including training, capacity building by using information technologies and reduction of non-revenue water.

**Details**

Engineering works:

- ◆ Construction of five (5) nos. of Water Treatment Plant of 174, 107, 93, 74 and 73 million liters per day capacities.
- ◆ Construction of Raw Water and Treated Water Transmission pipelines of a total length of 452 km consisting of Mild steel, Ductile Iron, HDPE and Glass Reinforced Pipes (GRP). The maximum size of pipes is 1800mm diameter.
- ◆ Construction of Distribution pipe networks of 4520 km and service reservoirs 76 nos. (Ground level 22 nos. and overhead 54 nos.)
- ◆ Installation of SCADA and Telemetry systems for automated operation and control of entire facilities from a centralized location.
- ◆ Rehabilitation of 3 existing water treatment plants, pump houses, booster pumping stations etc.

Institutional Strengthening Activities:

- ◆ Establishment of Citizen's charter, Complaint Redressal system, Project Monitoring System, Asset management, Employee Information System, Computerized billing and Accounting, Automated Meter reading of Bulk Consumers, Non-revenue water reduction, State-wide network and connectivity to all KWA offices, Training etc.

Project Accomplishments by AJCE Members

# TOKYO INTERNATIONAL FORUM
# Sustainable Design for Renewal Project

| | |
|---|---|
| **Principal Firm(s)** | P.T.Morimura & Associates,Ltd. |
| **Project Site** | Tokyo,Japan |
| **Client** | Tokyo Metropolitan Government |
| **Period** | Design & Construction 2007/10 - 2012/3 |
| **Type of Project** | Design for Renewal & improvement<br>Construction Supervision |


**Project Outline**

Since it opened in 1997, the Tokyo International Forum has had a high occupancy rate. Fifteen years have passed since then giving rise to concerns about the age and deterioration of equipment.

In 2008 plans for renovations were drafted and phased improvements are now underway.

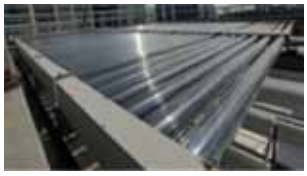
Staying true to the original architectural design intent of Rafael Vinoly Architects P.C. which aimed to create a big design impact, the concept involves the remodeling of the engineering systems which were (originally designed by P.T.Morimura and Associates), while at the same time protecting the environment, supplementing $CO_2$ reduction measures, upgrading functionality and incorporating technological advances to fulfill the expectations of visitors now and in the future.

**Solar power system**

- Renewal of existing solar panels - single crystal solar panels operate in parallel with commercial power supply
- Improvements in power generation efficiency

**Solar heating system**

- Improved solar heating system based on analysis of past energy usage
- More effective use of natural energy



**Lighting**

- Upgrade to LED or metal halide (CDM) systems for low energy lighting with halogen lamps
- Renewal of G block upper structure illumination based on computer simulations with extensive focusing
- Faithful to original design intent


**Functional upgrade and energy Monitoring**

- Renewal of integrated Building Management System (BMS) equipment
- Improved reliability, versatility, operation and maintenance
- Advanced functionality for energy measurement
- Introduction of data storage and control
- Support functions for future energy saving management

**$CO_2$ reduction measures :** about 760 t-$CO_2$/y

**Details :**
Building area : 20,951 $m^2$
Total Floor area : 145,076 $m^2$
Number of floor : 3 basement & 11 storeys

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Main Canal, Rengali Irrigation Sub-Project (L.B.C-II, Phase-I), India, with JICA Loan

Main Canal and Cross Regulator, Rengali Irrigation Sub-Project (L.B.C-II, Phase-I), India, with JICA Loan

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Elephant Corridor across Main Canal, Rengali Irrigation Sub-Project (L.B.C-II, Phase-I), India, with JICA Loan

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# Editor's note

As President Hirose of AJCE overviewed 2011, Tohoku disaster that struck Japan on March 11 changed the lives of all Japanese. All of them, including those who live outside of Tohoku, felt powerlessness of humankind in face of the power of nature. We, as consulting engineers, were also impacted by the disaster as we are involved in designing and maintaining those infrastructures that have been malfunctioned or totally destroyed by the earthquake and Tsunami. The members of AJCE are making important contributions for the recovery of Tohoku and this News Letter introduces only a few of them. We continue to invest our efforts to further help the people in Tohoku and other affected areas.

Almost one year has passed since 3.11. In the past year, all of us were too busy to reflect upon our roles in helping the people of Tohoku to rebuild their lives. I believe it is time to look back and rethink our true contributions for all people living in countries prone to earthquakes and other disasters.

Kenji Miyazawa (1896-1933) is Japan's great poet, writer of Children's literature, geologist, farmer, and teacher from Iwate in Tohoku region. Even a century after his time, Kenji's famous poem "Ame ni mo makezu" ("Not defeated by the rain") ---in which he talks about how a man should live his everyday life in simplicity and modesty despite relentless adversities---continues to draw a large circle of fans, including school children. It begins: "not defeated by the rain, not defeated by the wind, not defeated by the snow or by the summer's heat----". In Kenji's poems and fantastic stories that talk about the harmony of human beings and natural environment, we might be able to find some clues to rethinking about our future.

March 1, 2012
Keiji Orihara

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