Japan Society of Civil Engineers
International Activities Committee

Newsletter

No. 11 June 2003

Interview with President MIKANAGI

JSCE President Kiyoyasu MIKANAGI

During the past year, I have been involved in JSCE activities as the incoming president. Through this experience, I realized firsthand that JSCE activities do not limit themselves to the promotion of science and technology. On the contrary, the Society is active in improving the quality of civil engineers through a variety of efforts such as the amendment of the code of ethics and establishment of a qualifying system for civil engineers. It is also active in promoting a two-way communication with the public.

I feel that it is particularly important to address the issue of communication, especially towards society. The former President, Dr. Kishi promoted the development of the JSCE website as a way of communication and it is an important step. I would like to continue this process but the communication I envision is wider in scope. For example, the swift dispatch of the JSCE investigation team to the Touhoku region to study the impact of the earthquake that hit the region on May 26th was widely reported by the media. I believe the Society was able to make an appeal of its activities to the wider public. It was a wonderful opportunity to communicate with society.

I am also concerned of the state of mind of young civil engineers. I fear that the recent negative media coverage of the civil engineering profession is causing the loss of professional pride in young civil engineers. JSCE has already started taking actions to deal with this situation. We have carried out a survey on young civil engineers. I intend to set up a special committee to deal with this issue further.

New public works projects are declining in quantity for young civil engineers. However, within Japan, there are increasing demands for infrastructure maintenance and as for the infrastructure development, there are still many needs abroad. Therefore, I believe that the new generation must focus on appropriate target setting and efficiency. My message to young civil engineers is to pursue infrastructure development with a strong sense of mission and pride.

Those who specialize in civil engineering tend to have wide-ranging interests and talents. They are often capable of adapting to fields other than their specializations and displaying their abilities in a general field. I myself have experienced wide-ranging responsibilities in my career. I believe that these are important qualities for young civil engineers. Therefore, I would like the next generation of civil engineers to develop their careers without limiting their potentials.

I believe that the Society must also work towards realizing the mid-term goals that were set in “JSCE2005” in a steady and sustainable way.

Profile:

Mr. Kiyoyasu MIKANAGI was appointed as the 91st JSCE President on May 30th 2003.
After specializing in the Ports and Harbors Engineering at the Ministry of Transport, he has held various positions such as the Director-General of the Ports and Harbours Bureau of the Ministry of Transport and the Director of Water Vitalization and Environment Research Center, before his appointment to the Presidency of Kansai International Airport Co., Ltd. in 1996.

TAIWAN High-Speed Rail Starts Track Work

On May 12th 2003, track work begins its first welding for connecting 20 m each of single rails into 200 m long rails ready for installation on the slab truck at Panchiao Section located several km south of Taipei City. This signifies the construction of the Project advancing one step closer to the final completion, which is scheduled to be by the end of October 2005. The track work is divided into 5 lots for procurement, including 690 km of the high-speed main track of standard gauge width (1435 mm), 31 high-speed crossovers, 133 high-speed turnouts, 102 km of depot track, and 126 depot turnouts.

Design speed of the track way is 350 km/h, but actual operation speed is set at 300 km/h with some speed margin reserved for future extension or development.

Installation of the main track way will be 73 % on viaducts or bridges, 18 % in the tunnels, and 9 % on cuttings or embankments at grade. At present, the civil works of the Project have reached 75%, and the installation of the whole track work is expected to be completed within one year and 3 months, starting from July this year until September next year.

In parallel with the installation of the track work, the Electrical and Mechanical Core System will also start their installation in order to keep the Project progress as scheduled.

As the High-Speed Rail Project is one of the most important infrastructure developments being implemented in Taiwan, its activities and progress milestones always draw a great deal of attention from many Taiwanese. They are looking eagerly for the early completion of the Project so as to enjoy comfortable and convenient services of the High-Speed Rail available for travelling among major cities in the west coast of the Island.

By Chi-Shou HSIEH
(Taiwan Section, JSCE)

2003 JSCE Annual Meeting

During the three days from September 24th until 26th 2003, JSCE Annual Meeting will be held in Tokushima University in Tokushima City, Shikoku in the southern part of Japan. The program includes Scientific Lecture, which is an occasion for JSCE members to present their research as well as Special Lecture, Special Panel Discussion, and Banquet Party among others.

As in previous years, we have invited overseas organizations with which JSCE has signed the Agreement of Cooperation. We are planning events with international character such as the Round Table Meeting with the attendance of JSCE President, as well as Panel Discussion in English, English Common Session and the Welcome Reception to which international students attending this Meeting could participate. We truly look for your participation. Following is the tentative program of events:

1. Special Lecture by JSCE President (in Japanese), Sep. 25th (PM), Tokushima Cultural Center
2. Special Panel Discussion (in Japanese), Sep. 25th (PM), Tokushima Cultural Center
3. Banquet Party, Sep. 25th (Evening), Hotel Clement Tokushima

International Events

4. Round Table Meeting (Invited Guests Only) Sep. 24th (PM), Tokushima Univ.
5. English Research Panel Discussion: “Development of ITS in Asian Region” Sep. 24th (PM), Tokushima Univ.
6. Welcome Reception（For Invited Guests） Sept. 24th (Evening), Venue TBA
7. English Common Session: “Code Harmonization in the Asian Region-Environmental Consideration in International Project” Sep. 25th (Morning), Tokushima Univ.

Please visit JSCE website (http://www.jsce.or.jp） for more information.

Signing of the Agreement of Cooperation with Nepal Engineers' Association

On April 26th 2003, delegates from JSCE visited Nepal Engineer's Association (NEA) and exchanged the documents of cooperation, thus concluding the Agreement of Cooperation.

The President, Er. Narayan Govind Halwai and the Secretary General, Er. Bharat Raj Pahari and other members from NEA attended the meeting. From JSCE, Mr. Kazuo Suganuma, Representative of Nippon Koei Katmandu Office and Mr. Hideo Katagiri, Project Manager for Sindhuli Road Project Office, Nippon Koei Co. Ltd. participated.

In March 2003, Japanese Section of NEA was established with Prof. Madan B. Karkee of Akita Prefectural University as the Section Manager. The Japanese Section is comprised of approximately 50 Nepalese engineering students and engineers residing in Japan. We expect greater cooperation with NEA in the future, including exchanges right here in Japan.

"Civil Engineering" Feb. 2003 Feature Article: "Wind power generators and their future" (Summary)

Wind Power Generation Technology

There still remain numerous issues concerning wind turbines, such as the inertia force load during high rotation velocity, aerodynamic load during high tip speed, vibration problems, control difficulties and optimisation of operation during different wind velocities. Unsolved problems concerning power generation systems based on wind energy include 1) cyclic variable aerodynamic force due to wind shear, 2) miss-alignment and gyroscopic moment due to variable wind directions. Furthermore, the following problems exist concerning rotors: 1) aerodynamic performance problems, 2) material, structural and fatigue problems, 3) load and deflection problems, 4) safety problems with aero elasticity, 5) performance problems with tower and rotor. Concerning the electrical issues, there are subjects with control and braking system and energy generation device, as well as with the electricity system and the electricity quality and stability. Environmental issues include sound problems, aesthetic issues, electric wave problems and wind environment problems. In addition, the safety control, the controllability and the power transmission technology are under question. Finally, it is necessary to establish international standards for wind power generation systems through IEC (International Electrotechnical Commission.)

International Trends in Wind Power Generation

As of January 2002, the total capacity of wind power generators in the world reached 26 million kW, mainly in countries such as Germany, USA, Spain, Denmark, Holland, England, India and China. In Japan, the total capacity of 300,000kW accounts for about 1% of the total needs. The total capacity for 2010 in Europe and USA is set at 40 million kW. A new field of development based on wind energy is offshore wind generation, for which research is being done in Europe.

Offshore wind power generation is an area where we could expect considerable future progress. Denmark, Holland, Sweden and England have already carried out experiments and they are currently in smooth operation.

In different European countries experiments are carried out with large-scale wind turbines of more than 1MW. The profitability of wind turbines is improving year by year.

Wind Power Generation in Japan

In case the costs for wind turbines lowers, the objective of 3 million kW is well possible in the near future. The area to install equipment is set at 197 km^2, which is the maximum range based on wind predictions, but also from now on it is necessary to carry out further evaluations, prepare detailed wind maps, continue with infrastructure preparations (electricity wires, roads etc.) and renew the power cost maps. The objective of 300,000kW will mean 0.7% of the total 900 billion kWh per year (1998, efficiency of 25%). In order to achieve this objective, it is necessary to verify all the conditions that influence the power generation costs. Furthermore, geographical conditions, infrastructure, and building costs must be researched and the information must be stored in a database.

Structural Design of Wind Power Generation Systems

The blades are shaped as long thin beams, and require a surface with advanced aerodynamic properties. In times of typhoons and strong winds, large wind forces occur and at times of high rotation velocities, large inertia forces occur. Therefore, a light construction with high bending strength is necessary, meaning that it is necessary to 1) clarify operational conditions, 2) clarify accurately the loads under different conditions, 3) analyse stress based on suitable safety levels. Based on the results of these investigations, most constructions are lightweight and of low rigidity, and it is necessary to consider 4) excitation, 5) deformation, 6) fatigue. At each design stage it is necessary to maintain stresses under the allowable levels under all loads at the turbine, and to establish design guidelines that enable avoidance of breakdown of the turbine based on suitable safety considerations.

Future of Wind Power Generation

Technical investigations about scale enlargement (diameter of 60-100m or more), performance improvement, electricity quality, system protection, system linking, local wind conditions, construction methods, and cost reduction methods are underway. Scale enlargement is necessary for cost reduction based on efficiency improvement. Furthermore, investigations are necessary in order to achieve high performance, high longevity and low noise performance. Also it is necessary to improve mass production and further reduce the unit price of power generation and construction costs (wind velocity, equipment efficiency).

Concerning electricity quality, it is necessary to develop a variable velocity operation system, power alteration system, and power storage technology and improve the wind prediction technology. It is especially important to focus on solving energy and environmental problems using wind and solar power generation. By introducing new wind turbine technology, improved performance, reliability, economic feasibility, and environmental feasibility can be expected.

By Kazuichi SEKI
(Tokai University)

Voice from the Students

Kongkeo PHAMAVANH

The first time that I knew about JSCE was the 3rd year of undergraduate school in Nagoya University, Japan. I was recommended by the professor in the University to be a member of JSCE because my main major is Civil Engineering. I did not have much knowledge about this kind of organization and was not sure if it would be useful for my study life in the near future. After I continue my studying to graduate school, I started to join the research project of developing the numerical analysis technique so-called, Lattice Equivalent Continuum model. It's a simple analytical code, which could apply to several kinds of reinforced concrete structures and give accurate results in a short time. In published papers, I could find a lot of thesis and documents that are very useful to my research, and also have a chance to republish my research's result to everyone. It helps me deeply understand the function and the necessity of JSCE for developing the technology of Civil Engineering in Japan.

In developing countries like Laos, the infrastructures are mostly incomplete. Up until now, several projects are planned to improve the infrastructure in Laos by the foreign country's ODA, especially from Japan. But in the long view, the developing technology, technique and also educations of civil engineering in Laos are necessary. As in Japan and the other developed countries, I understand that the Society of Civil Engineering in each country is the most important function to develop the technology and also education. So that, to develop the education and technology of Civil Engineering in Laos, this kind of organization is necessary. Although due to the limitation of budget, a shortage of human resource and experts in Laos, the organization has not been available to be established so far, we have a strong hope to establish in the near future and make a place to exchange the information and technology among Laos and the world.

By Kongkeo PHAMAVANH
(Nagoya University)

"JSCE Scientific Exchange Fund" A Charitable Trust

As the project commemorating the 75th anniversary of the foundation of JSCE, we have established the JSCE Scientific Exchange Fund from a part of the Society's funds and from donations given from the Society members. By this means, we contribute annually to the promotion of international scientific exchange between civil engineers in Japan and abroad. For 2003, the aid amounted to 3.75 million yen (Total of 27 cases).

Because of the decline in interest rates, the fund is currently focused on the purposes of sending engineers residing in Japan to international conferences abroad and training foreign engineers who are recommended by overseas scientific organizations with the agreement of cooperation.

Every year in fall, we post the application information for this fund on JSCE website and in JSCE monthly magazine. Some of the international conferences to which the fund receivers have applied to are as follows: The 13th International Offshore and Polar Engineering Conference & Exhibition -ISOP-2003 (USA), the 12th Asian Regional Conference on Soil Mechanics and Geo technical Engineering (Singapore) and sixteen others.

Reports of the recipients of the Study Tour Grant (Foreign Engineers Training Program) are on JSCE website at:
(http://www.jsce.or.jp/committee/iefund/top.htm)

New E-Friend Registration System

We have just launched the new e-friend system, which is not limited to current JSCE members but is open to those who are living abroad and to international students studying in Japan. This system allows us to send out useful and timely information that does not limit itself to JSCE news. Please find more details on our website at: (http://www.jsce.or.jp/english/)

Publications

ARTICLES (From March to May 2003)
Structural Engineering / Earthquake Engineering Vol.20, No.1, JSCE, April 2003, 103 pages, Price: US$27.00-, ISSN 0289-8063

Journal of Hydroscience and Hydraulic Engineering Vo.21, No.1, JSCE, March 2003, 85 pages, Price: US$41.00-, ISSN 0912-2508

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