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## Report on JSCE Study Tour Grant



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# **2011 Japan Society of Civil Engineers Study Tour Grant Report**

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## **1. Introduction**

In commemoration of the 75<sup>th</sup> Anniversary of the JSCE, a fund was established in the name of "International Scientific Exchange Fund" to promote international exchange and cooperation among the civil engineers from different part of the world. The study tour Grant is offered to undergraduate students who are enrolled in the civil engineering program and pursue a civil engineering career to provide them an opportunity to learn the latest civil engineering technologies and projects. The STG program covers the travel and other necessary expenses during the stay in Japan since 1992. I am second Nepalese to be chosen for this STG and it is a big honour for me. I am deeply thankful for this opportunity to Japan Society of Civil Engineers and Nepal Engineer's Association. This report includes my day-to-day activities from the time I flew to Japan to the very last day of my stay. It also includes acknowledgment and conclusion at the end.

The duration of the study tour was seven days starting from 21<sup>st</sup> august to 27<sup>th</sup> august 2011. The ISEF committee has designed a perfect study tour schedule considering our research interests. The travel schedule included visit to public and private sector organizations and major civil engineering project sites. There was an incredible support from JSCE staff in designing a perfect study tour schedule considering my subject of interest i.e. disaster related activities. I am very much thankful to Mr. Yanagawa and others. The overall study tour that the JSCE finalised for me helped me a lot to know about the Japanese technology within the field of civil engineering. The study tour covered the visit of mega-city like Tokyo, Kyoto, Chiba etc.

It was really a marvellous trip to visit the Akashi-Kaikyo Bridge, the world's longest suspension bridge as a magnificent example of civil engineering construction and other great civil engineering achievements. The trip also included the visit to public and private research institutes and construction site. The research oriented culture in construction activities was the another interesting part I absorbed during the visit. For every new construction project, separate research wing is found to be established in order to ensure a superior output but we are quite distant from this culture in our country. Thus, Research oriented culture is the most important thing to learn from Japan. Apart from this, we have much more things to learn from Japan. In short, through this study tour I came to know about the civil engineering advancement in Japan which is actually a praiseworthy and it has widen my horizon regarding civil engineering.

## **2. Japan Society of Civil Engineers (JSCE)**

Japan Society of Civil Engineers is one of the leading and renowned organizations in Japan. JSCE was established as an incorporated association in 1914 with a mission to contribute to the advancement of scientific culture by promoting the field of civil Engineering and the expansion of civil Engineering activities. To achieve the above mission JSCE has carried out the extensive activities including

scientific exchange among the members, researchers, promotion of science and technologies relating to the field of civil engineering, social involvement, etc. Publication of periodicals for mutual communication among civil engineers, editing of books and publications on civil engineering, open place for presenting the results of studies and researches, presenting awards to promote development and further research in civil engineering, establishment of civil engineering library, international and domestic communication with relative academic societies and associations, cooperation in the development of infrastructure etc. are some of the works carried out by JSCE. With the aim of promotion of international scientific exchanges among civil engineers to contribute to the advancement of civil engineering discipline and civil engineering technologies, JSCE established the international scientific exchange fund in the commemoration of the JSCE's 75th anniversary. Study Tour Grant (STG) is one of the effective programs, which have been started since 1992.

Over the years, the JSCE membership has increased significantly from the initial 443 members to approximately 39,000 members at present, and is currently engaged in various wide-ranged activities around the world. JSCE has three international sections and nine regional chapters namely, Taiwan Section, Korea Section, UK Section are international sections whereas Hokkaido, Tohoku, Kanto, Chubu, Kansai, Chugoku, and Shikoku are its regional chapters. It has agreement of co-operation with 26 national engineering societies and institutions including Nepal Engineers' Association (NEA). NEA is one of the professional societies, which have signed an agreement of cooperation with JSCE in 2003.

### **3. 22<sup>nd</sup> August, 2011 (Monday)**

22nd August, 2011 the first day of STG at Japan Started with the brief discription of JSCE at JSCE headquater.After the brief description of JSCE I along with other STG-recipients were taken to "The Tsukuba Central Research Institute".First of all PWRI was introduced by DVD at the auditorium, which included the introduction of the organization ,priority research, overseas cooperation etc.



**Fig.1 Briefing of JSCE-STG at JSCE headquater**

## **Public Work Research Institute (PWRI)**

PWRI was founded to improve civil engineering technology by conducting research and development on civil engineering techniques, providing technical guidance, disseminating research results etc. and to contribute to the society by improving infrastructure and promoting development of the Hokkaido area. PWRI aims to offer outstanding achievements to meet public and international needs for civil engineering techniques.

After the introduction of PWRI Chief Researcher Mr. Kamoto and Researcher Mr. Nabesakar of ICHARM presented their presentation which was all about Integrated Flood Analysis System (IFAS). After the presentation it was the turn for the test track and research laboratories of PWRI. Before jumping into the High speed driving on the test track we had a memorial photograph at the main entrance of PWRI with the members of PWRI.



**Fig.2 Watching presentation on IFAS at auditorium hall at PWRI**



**Fig. 3 Memorial photograph at the main entrance of PWRI**



**Fig.4 High speed driving on the test track**



**Fig.5 Mr.Yamaki explaining the group at Dynamic geotechnical centrifuge laboratory**

Chief staff Mr. Takahashi from general affairs division demonstrated us about the test track and we got a marvelous opportunity for the high speed driving on the test track as well as to come through the road related experiment facilities, full size test tunnel, traffic sign, Test Bridge, experimental facilities for the lighting and impact test etc.

Dynamic geotechnical centrifuge laboratory was our next destiny. Researcher Mr. Yamaki from soil mechanics and dynamics research team demonstrated us about the geotechnical dynamic centrifuge. Explanation of the centrifuge was carried out actually looking at it and the situation of an experiment was shown by video.



**Fig.6 Mr.cho attending the group at Earthquake engineering laboratory**



**Fig.7 Mr. Umino explaining the group at Dam Hydraulics laboratory**



**Fig.8 Mr. Kawakami explaining the group about the pavement material**

Similarly, Researcher Mr.cho from Center for Advanced Engineering Structural Assessment and Research (CAESAR) made an explanation of the large- Stroke Dynamic Actuator and Axial Loading Apparatus which was again carried out actually looking at it and the situation of an experiment was shown by video at Earthquake engineering laboratory.

Senior Researcher Mr.Umino from River and Dam Hydraulics Engineering Research team ,at Dam Hydraulics laboratory too explained us about the models and roles of dams and also guided us in a tour of an experiment which was carried out by filling a dam model with water.Lastly, Researcher

Mr.Kawakami and Researcher Mr.Itani from Pavement Research team made an explanation of a loaded vehicle system and the newly developed pavement and marked an end of the day at PWRI.

#### 4. 23<sup>rd</sup> August, 2011(Tuesday)

After making a short visit to Asakusa during morning at free time, we went to JSCE at around 11:30 where Ms. Shibuya was waiting for us to take us to construction site of Obayashi Corporation at Funabashi, Chiba.

#### Obayashi Corporation at Funabashi

Obayashi Corporation is one of five major Japanese construction companies along with Shimizu Corporation, Takenaka Corporation, Kajima Corporation, and Taisei Corporation. Established in 1892 in Osaka, Obayashi operates in Japan and other countries, especially Southeast Asia and Australia, as well as the United States and Europe. Obayashi Corporation, one of Japan's largest general contractors, the Obayashi Group comprises 81 subsidiaries and 25 affiliated companies with a total of 15,000 employees and combined annual net sales of approximately ¥1,600 billion.

With the time, the needs of society change, and Obayashi has continued to develop innovative technologies in order to meet these changing needs. Obayashi has discovered a building method where it is possible to underpass roads and railways without a temporary closure of the existing infrastructure during the construction time. This method is called Ultra Rapid Under Pass (URUP) ,which is a innovative method for Nepal. I had never been on such construction site but on that very day I got a opportunity to have a close look at the site and learn about URUP. Such incentive method is very much required in the country like Nepal, where there is a big problem of congested traffic. Thus, I too hope to have the similar projects in Nepal in near future.



Fig.9 Demonstration on URUP at Obayashi corporation



**Fig.10 Construction site of Obayashi Corporation at Funabashi, Chiba**

## **5. 24<sup>th</sup> August, 2011 (Wednesday)**

It was early morning of 24<sup>th</sup> August 2011, I along with my friends were taken to Kajima Technical Research Institute by Mr. Yanagawa. At around 9:30 we were given a warm welcome at Kajima Technical Research Institute. Then, it was the turn for the introduction of the Kajima Technical Research Institute. After introduction we had a short guided tour of the Tobitakyuu Complex which was of about 35 minutes. At around 10.45 we were taken to Nishi-Chofu Complex after taking 10 minutes drive in a shuttle bus from Tobitakyuu. Though taking photograph inside the complex was prohibited we learnt so many things about the different researches and experiments being carried out at the institute.

### **Kajima Technical Research Institute**

Kajima corporation has always been ahead of the times in carrying out the extensive research and development of construction of construction materials and construction-production technology to build high quality structures efficiently, safely and yet economically. These efforts have met with great success in the development of high strength and super workable concretes, soil improvement methods and new methods of dismantlement, repair and aseismic reinforcement, in research on the durability of structures, in utilizing a wide range of machines for greater productivity and consistent construction quality and so on. This has made it possible for Kajima to build the first high-rise building in Japan of reinforced concrete, as well as, the world's first building with seismic response control. Staying ahead of the times, Kajima has been working out new seismic resistance methods such as base isolation and vibration control, new materials such as large space membranes and new nuclear power station construction methods. Apart from this, Kajima proposes new environmental technology that can co-exist harmoniously with the global environment focusing to energy saving. A few examples include building elements that provide heat insulation, absorb sound, resist moisture condensation and so on. Kajima values the association between the man and nature and attempts to harmonize its construction and engineering technologies with the living environments of plants and animals.



**Fig.11 Kajima Technical Research Institute entrance**

## **Waseda University**

After making a visit to Kajima, we had a toothsome lunch with one of the member of Kajima Technical Research Institute and then we went to Waseda University. At around 14:30, Mr. Yutaka Sakakibara, professor of water and environmental engineering, gladly received us and gave us the introduction about the Waseda university and also about the faculty of creative science and engineering department and laboratories. Apart from Mr. Yutaka, some other members of Waseda university were also present at the hall to uphold us namely, Andre Rodrigues dos Reis (Research Associate), Vo Huu Cong (Doctor student), Chotiwan Seangprasertkij (Master student), Sayo Morimoto (Master student ), Mitsuya Shimura (Master student) and Yoshihiko Inagaki (Master student). Mr. Inagaki made us familiar with their International project. They has prepared a short presentations on their project work. Presentation on Advanced Water Treatment Technology was presented by Shimura. Likewise, presentation on In-situ bio-barrier of groundwater was given by Morimoto. Furthermore, presentation on studies in graduate School of Waseda University was delivered by Andre, Cong and Chotiwan.

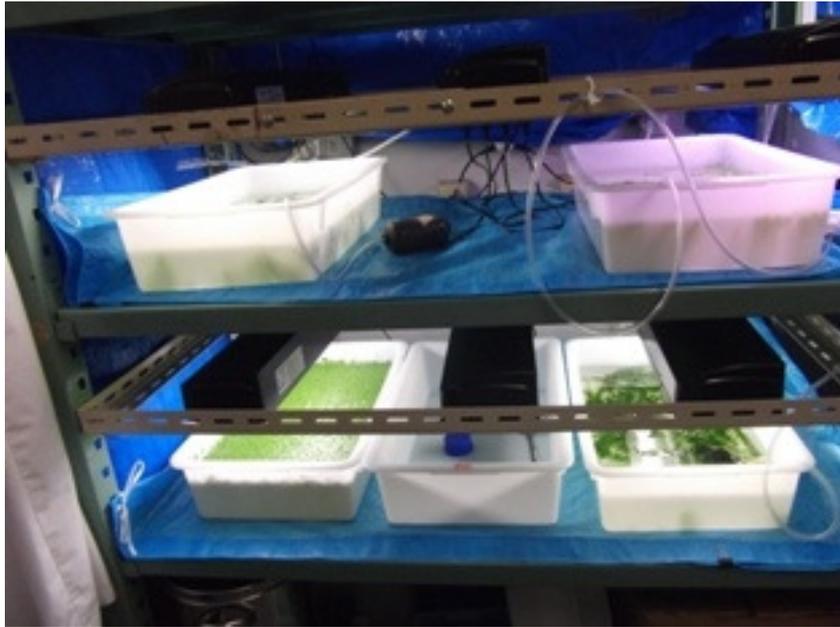
Next we had a short tour of Department of Science and Engineering (Main campus). We too were taken to the research laboratories where different research and experiment works were going on. This was again the end of the day at Waseda University. Later, we went to JSCE and collected our stuff, which was already kept ready by us at JSCE in the morning itself after checking out from Hotel Tokyu Stay, Yotsuya, Tokyo. In the evening we left for Kyoto by Shinkansen.



**Fig.12 Mr. Yutaka Sakakibara along with other members of Waseda University to welcome the group**



**Fig.13 Laboratories at Waseda University**



**Fig.14 Experimental setup at the laboratory of Waseda University**

## **6. 25<sup>th</sup> August, 2011(Thursday)**

After visiting so many public and private research institutes, laboratories and construction site next was the turn for moving towards the Great Hanshin-Awaji Earthquake Memorial Hall and the Akashi Kaikyo Suspension Bridge. Therefore, I along with Dr. Iton and my group headed towards DRI early in the morning.

### **The Great Hanshin-Awaji Earthquake Memorial Hall (Disaster Reduction and Human Renovation Institute)**

On January 17, 1995 at 5:46 am, the city of Kobe was hit by the Great Hanshin Awaji Earthquake, resulting in the death of more than 5000 people and the destruction of tens of thousands of homes. The Earthquake Memorial Museum, part of the Disaster Reduction and Human Renovation Institution, was opened in 2002 to commemorate this tragic event and to educate visitors about earthquakes and disaster prevention. The museum includes a large screen theater with realistic images of the earthquake's destructiveness, a documentary film about the recovery process, lots of information about the earthquake and various interactive games about disaster prevention.

The Earthquake Museum is located in HAT Kobe, a newly developed city district east of the city center. It can be reached in a ten minute walk from Iwaya Station on the Hanshin Main Line (4 minutes, 140 yen from Sannomiya Station) or in a 15 minute walk from Nada Station on the JR Kobe Line (3 minutes, 120 yen from Sannomiya Station).The Earthquake Museum is also just a few steps from the Hyogo Prefectural Museum of Art. Disaster Reduction and Human Renovation Institute is opened for everyone from 9:30 to 17:30 (until 18:00 July to September, until 19:00 Fridays and Saturdays) and is closed on Monday, the following day if Monday is a national holiday, December 31 and January 1. Also, the admission fee is 600 Yen. Apart from this, it is to be kept in mind that the admission ends one hour before closing.



**Fig.15 School going students visiting Disaster Reduction and Human Renovation Institute**

## **Akashi Kaikyo Suspension Bridge**

The Akashi-Kaikyo Bridge, also known as the Pearl Bridge, was completed on 5<sup>th</sup> April 1998 as the world's longest suspension bridge. The construction period was approximately 10 years. The bridge links the city of Kobe on the mainland of Honshu to Iwaya on Awaji Island by crossing the busy Akashi Strait. It carries part of the Honshu-Shikoku Highway.

Before stepping on the world's longest suspension bridge we attained a short presentation at the Akashi-Kaikyo Bridge exhibition center, which was all about the bridge and the things to be taken care while visiting the bridge. At the exhibition center I was able to collect ample amount of technical details about the bridge.



**Fig.16 Akashi Kaikyo Suspension Bridge at a glance**



**Fig.17 Akashi Kaikyo Bridge Exhibition Center entrance**



**Fig.18 Short presentation before visiting the Akashi Kaikyo Bridge**



**Fig.19 The group on the deck of the Akashi Kaikyo Bridge**

The bridge was designed with a two-hinged stiffening girder system, allowing the structure to withstand winds of 286 kilometers per hour (178 mph), earthquakes measuring to 8.5 on the Richter scale, and harsh sea currents. The bridge also contains pendulums that are designed to operate at the resonance frequency of the bridge to dampen forces. On the main cables of the bridge three high light discharged tubes are mounted in the colors red, green and blue. The RGB model and computer technology make a variety of combinations. Currently, 28 patterns are used for occasions as national or regional holidays, memorial days or festivities. The total cost is estimated to be 500 billion yen, and is expected to be repaid by charging drivers a toll to cross the bridge.

## **7. 26<sup>th</sup> August, 2011(Friday)**

### **The 13<sup>th</sup> International Summer Symposium at Kyoto University**

The International Summer Symposium is one of the opportunities for international students and engineers to share their current studies and ideas. Civil engineering students and young engineers who are interested in discussing, making exchange and networking about latest researches take part in this event.

This year the international symposium was held at Kyoto University. The entire event was divided into three parts, presentation, lecture and party at the end. The symposium started with the opening ceremony at the Khida Hall. For the same event I too had prepared and presented a short presentation on the topic A GENERAL REVIEW ON BUILDING CONSTRUCTION PRACTICES IN NEPAL. Dr. Hari Krishna Shrestha (Nepal Engineering College) and Mr. Shankar Dhakal (Ehime University, Matsuyama) had helped me a lot in preparing the same. As a result of this I received a heartwarming response for my work. At the end of the day it was the turn for the party where I got a chance for getting together with some of the Nepalese students and professors at Japan. At the party, the best presentations of the day were rewarded with the best presentation award. I took part in the quiz and was catered with the palatable drinks and snacks in the party. All in all it was a day filled with joy.



**Fig.20 Welcome at Kyoto University on the 13<sup>th</sup> International Summer Symposium**



**Fig.21 Me presenting the paper at the Khida Hall on the symposium**



**Fig.22 JSCE-STG Recipients with Dr. Wada (L-R Dr. Wada, Ms. Chua, Ms. Anjenine, Ms. Sushma, Mr. Abdulla)**



**Fig.23 Nepalese at the Symposium**

## 8. 27<sup>th</sup> August, 2011 (Saturday)

### Kyoto Sight Seeing

This was the last day of my stay in Japan and it started with the guided tour in the tourist bus. I along with my three friends (Ms. Chua, Ms. Anjenine and Mr. Abdulla), Mr. Yanagawa, Dr. Iton and Dr. Wada set on this guided tour early in the morning from hotel Hokke Club, Kyoto. This tour was supervised by Mr. Hero, guide for the day .He conducted the tour very well and guided us through the Kyoto.

The main motive of this guided tour was to visit the historically as well as culturally important places. The Golden Pavilion-Rokuon-Ji temple, Nijo Castle and so many other important places having a great significance and recognized as the world heritage were visited on that very day. Apart from perceiving with eyes I was able to know so many things about the past of the Japanese peoples and the Japanese culture from this guided tour. As a whole Kyoto city is astonishingly beautiful and the peoples over there were kind and lovely. However, it was the end of the STG and the day was a delightful surprise for us.



**Fig.24 Mr. Hero, our guide for the day demonstrating us about the Japanese culture**



**Fig.25 Me in front of the Higashiotemon gate**



**Fig.26 At Golden Pavilion-Rokuon-Ji temple, world cultural heritage**

Besides the JSCE schedule I visited so many other places during my stay at Japan. Some of the pictures depicting the same are as follows.



**Fig.27 At Edo-Tokyo museum**



**Fig.28 Tokyo Tower**



**Fig.29 At the gate of sensoji Temple, the symbol of Asakusa**



**Fig.30 Jonathan's, the best place for coffee and breakfast**



**Fig.31 At Sushi Shop**



**Fig.32** The group at Kyoto after Symposium



**Fig.33** At one of the best restaurant at kyoto (Ms. Chua and Ms.Sushma)



**Fig.34** Electric town, Akhihabara



**Fig.35** Akihabara Station

## 9. Acknowlegments

My sincere thank goes to Japan Society of Civil Engineers for its JSCE-2011 Study Tour Grant. I would like to express my gratitude to Nepal Engineers' Association, my family and all those peoples who helped me to make this visit fruitful one. I would like to enlist some of the names which includes: Mr. Hari Krishna Shrestha (Nepal Engineering College), Mr. Shankar Dhakal (Ehime University, Matsuyama) ,Takura YAMAMOTO (president of JSCE), Mr. Yanagawa (International Affairs Section JSCE), Dr. Iton, Dr. Wada and Ms. Shibuya.

## 10. Conclusion

The main motive of JSCE study tour grant is to provide an opportunity for exposure to the latest Japanese civil engineering technologies and projects. I feel this has definitely widened my horizon regarding Civil Engineering. I have learnt so much about Civil Engineering. It was the life time opportunity to encounter the new and latest technology and thus increase my enthusiasm and excitement towards my civil engineering career. My keen desire to learn about the Japanese technologies and methods that harmonize civil engineering with the environment met the destination after going to Japan in STG. When I look back on the days during my stay at Japan, I am convinced that those days were really very important period of my life and will play a significant role in my civil engineering career.

Both the countries (Nepal and Japan) bear similar geographical features i.e. both fall under the active tectonic zones, both suffer flood, landslides, both hold the young and very fragile mountains and so on. Thus, alike Japan seismic safety should be the vital concern for Nepal. Nepal has a lot of things to learn from Japan. Research oriented culture is one and the most important of them. Similar to Japan, Nepal should also address itself to the research and development in the search of new rational design and construction method to provide greater safety and more pleasant living space. Such step would definitely save Nepal from horrendous destruction due to earthquake and other natural disasters.

It was not only a chance to get the closer view of Japanese technology in the field of Civil Engineering but also a wonderful opportunity to get familiar with the culture and custom of the city of excitement and busyness i.e. Japan. Japan has been involved in the war against natural disasters like floods, typhoons, earthquakes, landslides and the like. This sort of natural disaster has taught the Japanese people to cope up with such adverse situations and at the same time has made them hardworking as a result of which they have developed advanced civil engineering and modern construction technologies. This really inspires me a lot and push me up to give my best in my work.

At the concluding point, It has been a privilege, an honour to be chosen for the JSCE Study Tour Grant and I will never, ever forget those memorable moments spent with my international friends at Japan. I will definitely convey to my colleagues and make use of whatever I have learnt during my stay at Japan for the betterment of my society.

## 2011 Study Tour Grant, JSCE (Itinerary 8/21-8/28)

<b>Date</b>	<b>Time</b>	<b>Destination to visit</b>	<b>Transportation</b>	<b>Accompany</b>	<b>Accommodation</b>
Aug - 21 Sun	AM	Arrival at Narita Airport Move to Tokyo Check In	TG 640(From Bangkok) Bus and Taxi	Mr. Yanagawa	Tokyu Stay Yotsuya, Tokyo TEL : 03-3354-0109
Aug-22 Mon	10:00-11:00	Briefing at JSCE Head Quarters, Tokyo  Move to Tsukuba	On foot  Train	Mr. Yanagawa	Tokyu Stay Yotsuya, Tokyo TEL : 03-3354-0109
	13:30-17:00	Public Works Research Institute, Tsukuba  Move to Tokyo	Train	Mr. Itoh	
Aug-23 Tue	AM	Visit to Asakusa at Free time	Train On foot		Tokyu Stay Yotsuya, Tokyo TEL : 03-3354-0109
	14:30-17:00	Visit to construction site of Obayashi Corporation at Funabashi, Chiba	Train	Ms. Shibuya	
Aug-24 Wed	8:00-12:00	Check Out Visit to Kajima Technical Research Institute, Tokyo	Train	Mr. Yanagawa	
	14:30-16:00	Visit to Waseda University, Tokyo	Train	Mr. Yanagawa	
	Evening	Move to Kyoto Check In	Shinkansen	Mr. Itoh	Hotel Hokke Club, Kyoto TEL : 075-361-1251
Aug-25 Thu	10:30-12:30	Visit to Disaster Reduction and Human Renovation Institution	Train Taxi	Mr. Itoh	Hotel Hokke Club, Kyoto TEL : 075-361-1251

	14:00-17:00	Visit to Akashi Kaikyo Bridge	Train	Mr. Itoh	
Aug-26 Fri	7:50	Leave for Kyoto university	Train	Mr. Yanagawa	Hotel Hokke Club, Kyoto TEL : 075-361-1251
	PM	Attending The 13th International Summer Symposium at Kyoto University (Presentation, Lecture, Party, etc.)			
Aug-27 Sat	8:00-15:00	Kyoto Sight Seeing  Check out	Bus	Mr. Yanagawa Mr.Itoh Dr.Wada	
	16:00-19:00	Return to Tokyo  Move to Haneda Airport.	Shinkansen  Train	Mr. Yanagawa Mr.Itoh	
Aug-28 Sun	00:20	Departure from Haneda Airport	TG 661 (for Bangkok)		