資　　料

1 ミニッツ

MINUTES OF DISCUSSIONS BETWEEN THE JAPANESE EVALUATION TEAM AND THE AUTHORITIES CONCERNED OF THE GOVERNMENT OF THE KINGDOM OF THAILAND ON JAPANESE TECHNICAL COOPERATION FOR THE PROJECT TO ENHANCE THE CAPABILITY OF THE FACULTY OF ENGINEERING AT THAMMASAT UNIVERSITY

The Japanese Evaluation Team (hereinafter referred to as "the Team") organized by the Japan International Cooperation Agency (hereinafter referred to as "JICA") and headed by Dr. Fumio Nishino, visited the Kingdom of Thailand from August 19th to August 27th, 1998. During its stay in the Kingdom of Thailand, the Team had a series of discussions with the Thai authorities concerned, and jointly evaluated the present achievement of "the Project to Enhance the Capability of the Faculty of Engineering at Thammasat University (hereinafter referred to as "the Project") and exchanged views on the possible technical cooperation program to be further implemented to fulfill the Master Plan of the Record of Discussions signed on 28th of March 1994 (hereinafter referred to as "the R/D").

As a result of the discussions, both sides agreed to report to their respective Governments the matters referred to in the document attached hereto.

Rangsit, 26th August, 1998

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THE ATTACHED DOCUMENT

I. INTRODUCTION

1. Preface

The Project was initiated in April 1994 and will be completed by March 1999. With the remaining project period of approximately seven (7) months, the Team visited the Kingdom of Thailand for the purpose of evaluating the achievement of the Project.

The evaluation has been undertaken jointly by the Thai Evaluation Members and the Japanese Evaluation Team (hereinafter named to as "Joint Evaluation Members(JEMs)").

2. Methodology of Evaluation

The Project Design Matrix prepared for this Project was used as the basis of evaluation. The Team reviewed all the activities and achievements, and evaluated the Project based on the following components;

(1) Efficiency
(2) Effectiveness
(3) Impact
(4) Relevance
(5) Sustainability

In order to evaluate the past performance of the Project, the following materials were used:

(1) The R/D, Tentative Schedule of Implementation signed on 28th March, 1994;
(2) The Project Design Matrix(PDM) which was attached to the Minutes of Discussion signed on 9th June, 1997;
(3) Plan of Operation for the Whole Period, the Annual Work Plans and other documents agreed on/or accepted in the course of implementation of the Project;
(4) Data of inputs and outputs from the Project; and
(5) Results of a series of interviews.

II. REVIEW OF ORIGINALLY INTENDED PROJECT PURPOSE AND OUTPUTS

In order to confirm the project purpose and originally intended outputs of the Project, such planning documents mentioned above were reviewed. Actual project activities and achievements were also reviewed and compared to those planning documents. As a result, the evaluation team found that some of the actual intentions of the Project is not reflected to the descriptions in those planning documents.

Therefore, based on the findings from the above, the evaluation team decided to use following descriptions on the project purpose and outputs as a basis for evaluation.

Overall Goal

The Faculty of Engineering (FoE) of the Thammasat University becomes one of the leading faculties in the engineering field of Thailand providing highly qualified engineers and technical services to Thai industry.

Project Purpose

The FoE acquires enhanced capability in education and research.

Outputs

A. The FoE acquires capabilities to educate qualified graduates by giving lectures, laboratory / workshops, guidance to senior student projects, etc. of high quality.
B. Academic staff of the FoE acquire enhanced research capabilities in research with developing institutional and non-institutional academic linkages for research collaboration.
C. The FoE's administration system is improved and acquires increased efficiency and effectiveness in management and coordination of education and research activities as well as overall management of the faculty.

III. ACCOMPLISHMENT BY THE PROJECT

1. Inputs

(1) Japanese side

a) Dispatch of Experts

In accordance with the R/D, the Japanese side dispatched sixteen (16) long-term experts and fifty five (55) short-term experts to the Project for technology transfer up to today. By the end of the cooperation period, additional seven (7) more short-term experts are scheduled to be dispatched.

b) Training of Thai Personnel in Japan

Nineteen (19) Thai counterpart personnel in total were accepted in Japan as trainees. Two(2) more counterpart personnel are scheduled to be dispatched for the training in Japan during the cooperation period.

c) Provision of Machinery and Equipment

The machinery and equipment valued at about 234.23 million Japanese Yen in total were provided. In 1998 Japanese Fiscal year, 24 million Japanese Yen are allocated for the provision of the machinery and equipment as the budget. Most of the machinery and equipment provided are effectively utilized for the Project.

d) Other Financial Support

For effective and smooth implementation of the Project, special measures have been taken to

supplement a portion of the local expenditures in accordance with the R/D. These measures include production of text books and travel allowance to attend to the international conference such as the South East Asian higher engineering education network seminar under JICA scheme.

(2) Thai side

a) Appointment of Counterpart

At present, eighty three (83) academic staff are appointed as the faculty members who are the counterparts in the Project. Among the above number, thirty five(35) faculty members are now studying abroad for higher degrees.

b) Allocation of Budget

Approximately 67.9 to 74.6 million baht were allocated to the Faculty of Engineering every year from 1994 to 1998 as the faculty budget for the general administration and teaching.

c) Financial Support from DTEC to the Project

DTEC has allocated 11.4 million baht in total up to Sept.1998, which were used for the expenses of the accommodation of Japanese experts, hiring secretaries/drivers for the Japanese experts, postage, office supplies and etc.

c) Provision of Facilities

The necessary spaces for laboratories and officse of the Project have also been provided in line with the R/D.

2. Activities and Outputs

(1) General

The project has been assisting on a variety of areas in addition to the basic planned activities included in the Original Project Request by the FoE of TU and the formulation prepared by JICA and agreed by the FoE.

Curricula have been continuously revised and upgraded by the joint efforts of the faculty members of the FoE and Japanese experts. Seventy (70) percent of the course syllabuses were prepared in English so that they could be reviewed not only by JICA experts but also by those who might have interest for the FoE's education elsewhere; for example those universities in the industrialized countries who have interest to enroll Thai students to their post-graduate programs.

For newly planned classes, model lectures were given by the JICA experts so that the more or less similar lectures given at the universities in industrialized countries, could be given by the counterparts. Preparation of a new lecture is one of the most difficult and time consuming matter. In this regard, the model lectures must have been a great contribution to the counterparts of the Project.

Many seminars were held including a seminar by a single speaker and a whole day seminar by a number of guest speakers. The total number up to August 1998 reaches 51 for the former type and 15 for the latter type. From the former type seminars, students as well as a few faculty members who had interest on these subjects should have gained new knowledge which was difficult to get otherwise. The latter type lectures should have contributed more to Thai engineers engaged in practice, the faculty members, and to a lesser extent to the students as well.

One of the most important contributions of the Project would be the improvement of laboratory/workshop courses. Japanese faculty members are exceptionally well qualified for them since they themselves carry out the courses at their home universities. This is unusual at industrialized countries.

Efforts are also made to publish text books, lecture notes, instruction manuals and others. The efforts are to be noted from two points. One is the advantage to the students of the FoE. The other is for the promotion of each individual counterpart of the FoE who contributed to the publication. The promotional system of the faculty members of Thai universities gives high credits for this type of contribution.

The Project also paid attention to the exposure of the faculty members to both domestic and international academic gatherings. This is regarded as one of the best ways to trigger the incentive to work on research.

During the Project period, post-graduate programs were established. The first program was in the field of civil engineering in 1996 jointly with SIIT. In 1997, the FoE itself established two post-graduate programs, one in the field of industrial engineering and the other in the field of civil engineering. The Department of Civil Engineering is even hoping to extend the post-graduate program to include a doctoral program on the year 2000, for which their own capability may not be strong enough. However, it would be strengthened with the continuous assistance of JICA for a few more years or collaboration with other foreign established universities.

It was unfortunate that two departments faced difficulty to recruit sufficient enough faculty members. The two departments are the Departments of Chemical Engineering and Mechanical Engineering. The responsibility is not due to the Project, rather it is the designer of this Project, who underestimated booming economy of Thai industries which attracted most of Thai engineers in these two fields by higher salary scales. The recent monetary crisis and depletion of Thai industries might make the recruitment of qualified faculty members to the two departments easier. As a matter of fact, the faculty members in the Chemical Engineering and Mechanical Engineering Departments increased from 8 and 8 on March 1997 to 14 and 12 on July 1998, respectively.

All of the above statements are qualitative. Quantitative evaluation is difficult. One of the indicator for which quantitative evaluation can be made is the highest and lowest scores of unified admission examination of students being admitted to the FoE of TU. It was among the fourth group on 1994 when the Project started, after Chulalongkorn, Kasetsart and KMITL, if compared for entire disciplines of engineering of all Thai national universities. These two scores of the FoE i.e., the evaluation of the FoE for its reputation by Thai society, is catching up Kasetsart and KMITL for the admission in 1997. The difference is very small. There is a good possibility that the FoE of TU may become the second in

popularity and reputation in the near future.

(2) Electrical Engineering

Seminars covering necessary and useful fields to the counterparts, such as electrical circuits, information processing, power electronics and opto-electronics, were organized mainly during staying periods of short term JICA experts. Some of the seminars were open engineers to outside of the FoE. This kind of seminar is also planned for this year.

A series of model lectures and special lectures were given by one JICA expert. The attendants to these lectures were not only the students of the FoE of TU, but also relevant counterparts. Participation of long term JICA experts to some of senior projects as supervisors was done. This trial is thought to be effectively functioned.

In order to enhance the efficiency of research activities, intentional separation of the laboratory in a certain field was done from the laboratory for course works. Research theme inputs and cooperative researches were performed through counterpart training in Japan as well as through cooperative works with long term and short term JICA experts.

Publication of text books and lecture notes are thought to be one of the outputs of the Project. Research reports appeared in annual reports of the FoE of TU, and domestic and non-domestic journals.

The most noticeable outputs are considered to be participation to international conferences and their presentations there. The presentation of a research paper at a real and large scale international conference (IEEE International Conference on Power Conversion) was the first experience to the electrical engineering department since its first student enrollment in 1990. Journal papers are expected to increase with progress of research activities.

(3) Industrial Engineering

On the grounds of suitable inputs of providing machinery and equipment, training of 5 (five) counterpart personnel in Japan, dispatching 14 experts including 3 long-term ones and the constructive eagerness of Industrial Engineering Department members, almost all of the following planned activities have been smoothly implemented:

(1) Establishment of industrial engineering education system including curriculum improvement, development of teaching materials, improvement of teaching methods, course development and improvement of laboratory and workshops, and supervision of senior student projects.

(2) Conducting various kinds of seminars and symposia oriented by the practical and interdisciplinary activities in the industrial engineering field in order to make it possible to basically improve the research capability of Industrial Engineering Department members.

(3) Improvement of administration system of I.E. Dept. including the fulfillment of staff development, management of equipment and machinery, development of a post-graduate program, and approaches to the cooperative program establishment to improve the teaching and research activities of I.E. Dept. members.

(4) Utilization of machinery and equipment provided by JICA so as to be able to improve the

research activities.

As a result, during four and half years since the inception of the Project, the following achievements have been done:

(1) Effective improvement of teaching and research capability of I.E. Dept. members.

(2) Establishment of the part-time course of post-graduate program in I.E. Dept.

(3) Establishment of the academic linkage between Toyota Co. and I.E. Dept.

(4) Coming to the possibility of making the academic exchange program between Nagaoka University of Technology and I.E. Dept.

(5) Sure and steady increase of the total number of teaching staff which is 19 at present and will be able to be 20 not later than the end of 1998 JFY.

(6) Making the future plan to improve the research capability in the field focused on the following three targets:

1) Industrial Management studies.

2) Manufacturing Engineering studies.

3) Material Science studies.

(4) Civil Engineering

The Department of Civil Engineering took the best advantage from the JICA Project among five departments of the FoE. Major reason is the successful recruitment of reasonably qualified faculty members at an early date since the faculty was established on 1989.

Out of the allocated number of 20 faculty positions, 18 positions have been filled already. Efforts are being tried to appoint another two positions. There are many applications by the candidates who hold Ph.D. degrees. However, the fields that the Department wishes to fill and the fields that the candidates are interested in are not matching. The Department is not in hurry to fill the 2 vacant positions, rather it is looking forward for appropriate candidates to appear thinking for a well balanced development of the Department in the future.

Out of 18 faculty members, 9 members are sent out for their doctoral studies. Because of this, only 9 faculty members are present as of August 1998. This number is comparable to a typical arrangement of a department of civil engineering of Japanese universities, which consists of four chairs, i.e., 8 faculty members. Out of 9, there are 8 faculty member who have doctoral degrees, 3 from Japan, 1 from USA, 1 from Canada, 2 from France, 1 from AIT.

One advantage of the Department of Civil Engineering is the presence of AIT with strength in civil engineering and the presence of four Japanese universities running English programs in the fields of civil engineering, which contributed to the FoE, firstly as the host for training and secondly by dispatching short term experts who are proficient in English.

JICA cooperation seems to have been extremely fruitful for these young faculty members who finished their doctoral programs and ready to develop, although this is difficult to quantity.

The Department took advantage by cooperating with the neighboring SIIT, where most of the faculty members were the doctoral degree holders from four civil engineering departments of the Japanese universities. Since all of them were recipients of *Monbusho* scholarships, this might be understood as an

indirect contribution of Japanese ODA.

In spite of the fruitful cooperation, outcomesin research works were not evident. There were a few papers, being published in domestic journals and international journals. On the other hand, there is some evidence that the research activities are increasing. Presentation of research outputs at the domestic meetings have been steadily increasing and so at the international meetings. Presentation of research works at domestic meetings was 3 in FY94, which was increasing to 5, 5 and 6 by the following years. Similarly, the numberof presentations at the international meetings was increasing yearly from0 at FY94, to 2 at FY95, 4 at FY96 and 7 at FY97.

Since there are so many recent Ph.D. graduates in the Department from major universities in the world, there is no doubt that the teaching is made at a reasonably high standard to be comparable with the universities in the industrialized countries.

Equipment and facilities have been well maintained, and they have been utilized whenever necessary.

The Department is waiting another 9 faculty members with advanced studies at the universities in industrialized countries to return. 4, 3 and 2 members will receive the doctoral degree in 1999, 2000, and 2001, respectively. Those who are present are still lacking in experiences in research. It is unfortunate for Thai universities including the FoE of TU that there exist only a few experienced faculty members in research in Thailand. There is none existing in the Department of Civil Engineering. Additional and continued advice from the experienced faculty members from the industrialized countries is essential for those faculty members to enhance their research capability.

In summary, teaching capability improvement such as curriculum and course development is satisfactorily achieved. Grant-in-Aid project such as various instruments is satisfactorily achieved. However, the followings are still necessary for the future research developments by the extention of Project period.

1. to motivate the research activities by the help of JICA support in dispatching the short term experts and training in Japan.
2. to develop the doctoral program and consequently to make the Department a leading research-oriented organization in Thailand.

(5) Chemical Engineering

Principal activities of the Project include teaching capability improvement, administration system improvement as well as research capability improvement. At the initial and intermediate stages of the Project, senior professors were dispatched as the long-term experts, who gave useful suggestions concerning to the establishment of the Department, education system, the preparation of the laboratory, the provision of equipment and so on. They carried out model lectures and seminars on current topics, which were useful to indicate the education methodology and gave the teaching staff an incentive to do the research works. Since equipment either by grand aid or technical cooperation were mostly selected on the basis of detailed discussion among the experts and counterparts, they have been effectively used and seem to be sufficient for the education as well as for research activities, except small items for the new and coming staff. At the final stage of the Project, a rather young long-term expert was dispatched in order to

improve laboratory courses and to give advises for the senior student projects. At the present time, since the activity is focused on the research capability improvement in order to maintain the quality of the staff after the termination of the Project, joint research programs with Tokyo Institute of Technology as well as Thai leading universities such as Prince of Songkla University, Chulalongkorn University and Khon Kaen University are in progress. The participation to international and regional congress is also promoted.

Although planned activities have been functioning well due to enthusiastic efforts of long- as well as short-term experts, a problem comes from a shortage and also a replacement of the teaching staff. As of August, 1998, seven staff including only one doctor-degree holder are working and eight are studying outside. Since four posts are still available, qualified staff being able to cover rather weak fields such as energy, environment and so on should be fulfilled as soon as possible. The teaching staff actually working has the strong will to do research works and the new head of the Department seems to be very eager to establish the regime of the Department. So long as new staff will join and the absentee members will come back in the near future, the cooperation of Japanese experts and training in Japan will be essential to sustain the outputs and to establish graduate courses in four years.

(6) Mechanical Engineering

Owing to the lack of staff the Department could not admit students until 1996, two years after the commencement of the Project. This might make it difficult that, in spite of the efforts by both experts and counterparts, the Department realizes to achieve the planned activities thoroughly that are designated in PDM by the end of the project period.

The main activities and outputs which will have obtained under the Project during the project period are:

1) advice and suggestions on teaching and research for the counterparts by the total number of 14 man-months of short term experts at the Department,
2) dispatch of one counterpart to Kobe University and Nogaoka University of Technology for one month,
3) installation of facilities and equipment for education,
4) publication of five textbooks of lecture and mechanical engineering labs,
5) contributions to the Annual Research Report, the FoE of TU (total number of papers is 3),
6) participation of two staff in academic meeting,
7) organization of eleven seminars, including workshops.

The improvement of educational environment such as staff development, curriculum and course preparation and teaching materials, and lab/workshop instruction installment is satisfactorily achieved, however, the followings are still left for the future prospects to be accomplished, possibly by the extention of the project period.

1. to motivate research activities by the help of JICA support in dispatching short term experts and installing the research facilities,
2. to prepare the post-graduate program which is planned to open in 2002 and consequently to make the

Department a leading research oriented organization in Thailand.

(7) Administration

Four research reports have been published. Publication of research reports is a standard activity at a faculty of engineering of a university at industrialized countries, but not necessary at a developing country. Efforts have been spent at the FoE for this purpose. The first one was published compiling reproductions of each paper published during the year 1994 together with some pertinent information on the FoE. The publication is entitled as "Research Report 1994, Vol.1. Since the first publication, continuous efforts were spent resulting annual publication each year. The latest publication is "Research Report 1997, Vol.4. The publication might be quite notable among the Thai universities. It is hoped that the same efforts have to be spent for the years to come.

The equipment and machinery available at the FoE including those procured by Thai Governmental budget and those granted by the Japanese Government are extremely well maintained and heavily used. This is partly due to the efforts of Japanese experts, partly due to the allocations of sufficient budget by Thai Government and JICA, and partly due to the income generated as the charge for the use of students and faculty members of SIIT.

Out of 83 faculty members, 35 are studying for advanced degrees at universities in the industrialized countries for their academic development. Most of the expenditure for their study abroad are borne by the FoE, which has to be highly praised as the supporting efforts of Thai Government.

The last item is academic exchange with foreign universities. The FoE has already made agreements with two universities in Japan and one university in U.K. They are; Tokyo Institute of Technology, Saitama University and Nottingham University. Linkage was also tried to establish with industry. So far an agreement was signed between Toyota Motor Thailand Co., Ltd. and the Department of Industrial Engineering of the FoE. The agreement includes lectures by Toyota staff to students, internship at Toyota for the 3rd year students, laboratory works at Toyota, and joint seminars with Toyota for engineers in Thailand and students at the FoE.

One of the most important subject for the management is how to raise additional funds so that the salary being paid by the Government can be complimented from other sources.

The FoE has established TU-Nottingham University linkage program by their own efforts. The FoE enrolls for its undergraduate programs roughly 250 students as requested by Thai Government and educate them up to Bachelor's degrees. In addition, the FoE enrolls additional 50 to 60 students for the TU-NU program. These students pays higher tuition directly to the FoE. The FoE educate them for two and a half years and then they are sent to Nottingham for additional two years. After satisfying necessary requirements, these students are awarded NU and TU Bachelor's Degrees.

In addition, the Departments of Civil Engineering and Industrial Engineering established Master's Programs financially independent from the government so that the FoE can manage the budget freely. Similarly, the other departments will establish Master's Programs in the near future. With these additional efforts, the staff of the FoE can get an appropriate salary, which is contributing to retain their qualified faculty and staff in teaching and research works as well.

(8)Project Management

a) The Joint Coordination Committee(JCC)

The JCC meeting was held three(3) times during the project period.

b) The Steering Committee

The steering Committee meetings whose members are the Dean of the Faculty, heads and coordinators of the Departments, and Japanese experts were held fifteen times.

c) Progress reports

Four(4) Progress Reports whose title is "Progress of the Activities of the Project" were published and distributed to the counterparts. The brief weekly information paper "JICA Project Weekly" has been also published in order to share the information on the Project among the counterparts, and No.31 of which was published dated on August 14th.

d) Study Teams

After commencement of the Project, Japanese Study Teams were dispatched three times including this Evaluation Team in order to monitor the Project progress and evaluate the achievement.

III. ANALYSIS BASED ON THE FIVE EVALUATION CRITERIA

1. Efficiency

1.1 Experts from Japan

Experts on necessary fields have been seconded on appropriate timing. One of the factors for high efficiency was their frequent and continuous advice to the counterparts. This was enabled by recruiting most of the experts from same departments of Japanese universities which also received the counterparts for training. Optimum combination of more than one short-term experts in different fields and training in Japan seems to be the best strategy to accommodate wide-ranged academic needs of each department. Due to the delay in recruiting academic staff and student enrollment, no long-term expert was seconded to the Mechanical Engineering Department. As a result, total inputs of experts on person-month basis remained at the level of one fourth of the inputs to other departments.

1.2 Counterparts

In order to recruit qualified staff, the FoE put much efforts in increasing their salary, including recently introduced "top-up" salary system. As a result, the faculty could increase the number of academic

staff from 44 at the beginning of the Project up to 83 at present. However, as many as 35 of them are now studying for higher degrees and not being engaged in education and research in the faculty. Because of this, inputs of counterpart personnel have been largely limited in some fields, among others in the Chemical Engineering and Mechanical Engineering Departments where the input level reached only less than half of other departments. As the consequence, progress of the Project has been seriously affected by the limited inputs of counterpart personnel.

1.3 Collaboration between the Expert and the Counterparts

In spite of some language barrier, collaboration between the experts and the counterparts was conducted efficiently based on enthusiastic efforts by both sides. They have been in touch even after the return of Japanese experts from Thailand using fax and inter-net communication, though the latter has been not always stable in some of the departments. Improvement of inter-net facilities could increase the efficiency of their collaboration further more.

1.4 Training in Japan

Counterpart training in Japan has been conducted effectively with careful coordination in advance, though which was not always the case in the early stage of the Project. If prepared thoroughly, merit of the training could be maximized by appropriate selection of recipient professor(s) of corresponding fields and effective combination with experts' advice in Thailand.

1.5 Financial Support for Academic Activities

In addition to the above mentioned technical support, financial support was given to such academic activities as seminars, symposia participation to academic gatherings enabled an efficient development of research capability. These activities were also effective in facilitating connections and raising publicity of the FoE among the academic circles in and out of the country.

1.6 Provision of Equipment

Education and research equipment provided by the preceding grant aid and the Project seems to have been selected appropriately and fully utilized with no serious problems in operation and maintenance. However, in a few cases, equipment was provided with lowered efficiency due to a mismatch of timings between delivery of equipment and dispatch of short-term experts or availability of counterpart personnel.

1.7 Project Management

Project management was conducted efficiently enough thorough the Joint Coordination Committee, the starring committee, experts' participation to the regular department meetings, and dissemination of the progress reports and weekly news letters. Due to independent nature of academic fields, management within departments was assumed to have more importance compared to faculty wise one. Therefore, most of the management efforts has been invested at the department level.

1.8 Summary

In spite of the limited input of qualified counterpart personnel which restricted the progress of technical collaboration in some fields , the Project was implemented efficiently enough, thanks for the flexible adjustment of JICA inputs in terms of experts, training, and equipment in accordance with the conditions in Thai side, and also owing to maximized continuity in academic exchanges and collaboration between the experts and the counterparts.

2. Effectiveness

2.1 Overall Effectiveness

The Project enhanced the FoE's capability in education and research and improved its administration system, bringing substantial contribution to the quick development of the FoE. Two out of the five departments, i.e. the Civil Engineering and Industrial Engineering Departments, had started post-graduate courses, and remaining three departments are now preparing post-graduate courses to be started in the near future. While, the FoE could develop little capability for technical services to Thai industry yet. Although further fulfillment of human resources is expected as the academic staff at present studying for higher degrees return to the faculty, continuous development of research capability is essential in order that the FoE become capable enough to provide qualified education, research and technical services.

2.1 Development of Education Capability

Curricula and syllabuses were developed, and course preparation was made by the Thai staff referring the advice and guidance given by the experts from time to time. Preparation of basic textbooks were almost completed in some departments, though continuous efforts are required. Laboratory and workshop instructions and manuals need further development in many departments. Equipment for educational experiment is sufficient and fully utilized. Model lectures given by the experts made a good contribution to the improvement of some courses. The counterparts increased their capability in supervising senior projects being given advice and guidance by the JICA experts.

In general, the FoE seems to have acquired basic capacity for education of under-graduate students. However, the FoE is still suffering from the serious shortage of teaching staff. The FoE requires many

part-time teachers. Some of the full-time staff need to take charge of many courses which are not always their fields of specialization. In addition, many teachers do not have enough research experiences to supervise senior student projects. In these regards, not only increasing the number of full-time teaching staff, but also continuous human resource development focused on research aspects is essential. Continuous development and improvement of teaching material will be necessary as well.

2.2 Development of Research Capability

In order to enhance research capability of the counterparts, such activities are promoted as organization of and participation to academic gatherings, seminars, symposia, person-to-person advice on research, research collaboration, and study for higher degree. In addition to the FoE's own efforts in sending its academic staff for further study, the Project financed two counterparts' post graduate study in Thailand. Two counterparts were also sent out for higher degree studies in Japan making use of the scholarships from the Japanese Ministry of Education, Science, Sports and Culture specially allocated for JICA projects. These activities are carried out based on precise elaboration of counterparts' research experiences, capability, and their actual needs for technical support. Consequently, significant increase in their research capability was achieved in those cases where the counterparts had certain level of research experiences and were ready for development.

As for the Civil Engineering Department where basic research capability was relatively high with larger number of active staff and higher proportion of doctoral degree holders, research activities have been strongly promoted resulting in numbers of academic papers. On the other hand, in the Chemical Engineering and Mechanical Engineering Departments where recruitment of qualified staff has been delayed, research activities has been rather weak and capability development has been slower. In the Electric Engineering and Industrial Engineering Departments, research has not yet been very active in some of the fields due to lack of qualified human resources. It should be also noted that even the doctoral degree holders among the faculty members needs further enhancement of research capabilities, since many of them are still young and have limited research experiences. Thus, there still remains plenty room for research capability development.

The academic staff of the FoE could establish personal academic connections by organizing seminars and symposia, participating academic gatherings, and continuous exchanges with the Japanese universities which have been sending the experts and conducting the counterpart training. Moreover, on the ground of these personal linkage, institutionalized academic linkages have been established by the Project; namely, academic exchange agreements with Septum University on civil engineering, the Tokyo Institute of Technology mainly on chemical engineering, and with Nagaoka University of Technology on industrial, electrical and mechanical engineering which is now under discussion. In addition, an academy - industry linkage with a Japanese firm in Thailand was initiated by the Industrial Engineering Department. These institutional and non-institutional academic linkages established by the Project will be an indispensable ground for future promotion of research activities by the counterparts.

Research equipment will require further improvement according to the increase in research activities for the future, though there seems to be no serious shortage at this moment. The Mechanical

Engineering Department will need more research equipment, because of the relatively small input to the Department.

2.3 Improvement of Administration System

Being provided with the advice by Japanese experts who often attended department meetings, administration at department level was improved to become more effective in promoting exchange and cooperation among the staff and coordinating education and research activities. There was limited opportunity to support an improvement of administration at the faculty level, partly because of the high independency of the Departments. Main contribution of the Projects at the faculty level was the support for publication of annual research reports and newsletters. They are important for raising the faculty's publicity and accumulating information on faculty's activities.

3. Impact

Major impact of the Project realized at present is provision of engineers of higher quality to Thai industry. In terms of research and technical collaboration, there is a limited impact to Thai industry since the linkage between the FoE and Thai industry is not very solid yet. However, in the long run, the Project will produce positive impact in satisfying Thai industry's needs for qualified engineers and technical services, by speeding-up the capability development of the FoE. In addition, personal and institutional academic linkage as well as academy - industry linkage established by the Project will serve as a good basis for promotion of future academic exchanges and research collaboration.

Although the contribution of the Project is not measurable, there is some evidence for increasing popularity of the FoE; that is the raise in ranking among the universities in Thailand shown by the highest / lowest scores of the unified admission examination of students being admitted. No concrete unfavorable impact of the Project is observed nor foreseen.

4. Relevance

While the development of Thai industry has been slowed down and employments of the FoE graduates were rather decreased in 1998, it is believed that Thai industry still has large needs for qualified engineers from a long-term perspective. The FoE has a view that Thai industry will need more qualified engineers and researchers for future advancement, especially in such fields as industrial engineering, electric engineering, chemical engineering, and mechanical engineering.

On the other hand, the original purpose of the Project, i.e. enhancement of the FoE's capability in education and research, is regarded to have been achieved only partially, leaving research aspect rather behind. Therefore, the original overall goal and the Project purpose are still valid enough at this moment. Considering that the level of achievement is not same among the Departments, and also that faculty member's education capability will be developed after all if he / she could develop good research capability, there shall be certain priority order in future resource allocation. The priority areas will

include; the Mechanical Engineering and Chemical Engineering Departments which started-up later; capability development of the academic staff for supervision of senior student projects and research activities of their own; and development and strengthening of academic linkages as a basis for research promotion.

Some weakness can be pointed out in the past planing practice and its documentation. There were no detailed and concrete plans for each Department at the time of commencement. No concrete target was indicated in the planning document. Nevertheless, after the commencement of the Project, actual inputs and activities seem to have been well coordinated and adjusted according to the actual situations in each Department, based on detailed and precise examinations by the chief advisor and the long-term experts. Consequently, activities by the Project have been not always same as described in the original planning document, i.e. PDM and Plan of Operation. However, in reality, achievement of the Project can be regarded to be nearly the best owing to the optimized inputs and activities adjusted to the given conditions in each Department.

5. Sustainability

The FoE has a plan to recruit more academic staff until all the positions are fulfilled, and also planning to increase the ratio of doctoral degree holders exceeding 50% by re-positioning those who are now studying for higher degrees and also sending out new staff for higher degrees. In addition, the FoE envisages to establish post-graduate programs at each Department, at least a master's program in each department to be started within 4 - 5 years. If these plans are materialized, outcome of the Project could be fully utilized in a self-sustainable manner.

The academic linkages between the academic staff of the FoE and the Japanese professors have placed a solid basis for continuous human resource development through academic exchanges and research collaboration. However, due to the shortage of highly qualified researchers, it will be rather difficult to get research funds from outside for the time being. Therefore, it is anticipated that the human resource development of the FoE academic staff can not be continued, if the the Project is terminated in March 1999 as scheduled.

Considering the above, it is very important to continue human resource development focused on research aspects. Additional assistance will be necessary to continue capability development until certain level of sustainability is obtained.

Recent economic crisis is believed to have brought rather favorable impact to the recruitment of qualified staff because of narrowing the salary gap with private sector. On the other hand, the government's austere budgetary policy forces the FoE to seek more financial sources of its own. In this regard, the "top-up" salary system currently being employed by the FoE has an important contribution in retaining qualified staff. Continuation and expansion of this type of programs shall be encouraged for the future.

V. CONCLUSIONS AND RECOMMENDATIONS

Based on the findings and analysis on the five evaluation criteria, the following recommendations are made.

1. The recruitment of the teaching staff to fulfill the planned number was delayed in the Chemical Engineering Department and Mechanical Engineering Department and hence the numberhasn't yet been sufficiently fulfilled. The enrollment of students in both the Departments was also delayed, starting respectively from 1993 and 1995. For this reason, the technical transfer from the Japanese experts to the teaching staff who are the counterpart personnel in the above two Departments hasn't been carried out as originally planned. Especially for the Mechanical Engineering Department, commencement of Japanese inputs was also delayed and total inputs provided so far is rather smaller compared to those for other Departments. As the result, it is anticipated that the planned project activities could not be completed and the expected Project Outputs could not be achieved in the fields of Chemical Engineering and Mechanical Engineering by the end of the Project period.

2. The expected outputs for improvement of teaching capability in the fields of Electrical Engineering, Industrial Engineering and Civil Engineering were almost achieved and the planned activities for improvement of research capability in the same fields have been vigorously conducted. However, research capability of the FoE hasn't been satisfactorily developed yet to sustain research activities and promote collaboration with other institutions. This is a natural consequence for a project in a higher education, especially to a newly established faculty.

3. According to the above observation, the Joint Evaluation Members(JEMs) recommend that the Project be extended for a minimum of another two(2) years in order to accomplish the project purpose and sustain the enhanced capability of the FoE. Yearly project inputs could be on reduced scale, but it should include dispatch of Japanese experts, training of Thai counterpart personnel in Japan and provision of machinery , equipment and spare parts.

4. The JEMs also recommend that during the extension period the activities for improvement of teaching and research capabilities in the Chemical Engineering and Mechanical Engineering Department shall be continued and selected activities for improvement of research capability in other Departments shall be conducted. Moreover, the outreach activities to disseminate research results or to promote technical services to Thai industry and to strengthen collaboration with other institutions shall be increased. The activities desirable during the possible extension period are suggested in the Annex I. The plan of operation for the extention period should be drafted and agreed by both side during the remaining Project period.

5. The JEMs recommend that it is necessary to dispatch the following Japanese Experts during the extension period of the Project assuming the period is for two years.

(1) Long-term Experts; a. Chief Advisor (one)

b. Coordinator(one)

c. Additional long-term experts to be considered if necessary after the plan of operation for the extention period would be drafted.

(2) Short-term Experts; a. Mechanical Engineering

b. Chemical Engineering

c. Other three Engineering fields if necessary

d. Other cross-sectoral fields if necessary

Annex1

Suggested Activities to be supported for the Extension Period (Follow-up Activities)

Activities / Department	Mechanical Engineering	Chemical Engineering	Electrical Engineering	Industrial Engineering	Civil Engineering
1.Teaching Capability Improvement					
a.Curricular Improvement	-	-	-	-	-
b.Course Development	-	-	-	-	-
c.Improvement of Teaching Methods by model lectures	X	X	X	X	-
d.Improvement of Lab./workshop Courses	X	X	-	-	-
e.Assistance in supervision of senior Students & projects	X	X	-	-	-
f.Development of Teaching Materials and Lab. instructions	X	X	-	-	-
2.Research Capability Improvement					
a.Promotion of research activities	XX	XX	X	X	X
b.Assistance for presentation of the results in academic meetings and/or journals	X	X	X	X	X
d.Promotion of studying in Thailand and abroad for higher degrees	X	X	X	X	-
3.Administration system Improvement					
a.Facilitation of cooperation and information exchange among the Faculty members	X	X	X	X	X
b.Publication of FOE Annual Report			X		
4.Outreach activities to disseminate research results or to promote technical services to Thai industry and to strengthen collaboration with other institutions					
a.Domestic/International Seminars	X	X	X	X	X
b.Joint research with other institutions	X	X	X	X	X
c.Academic exchange and student exchange	X	X	X	X	X
d.Industry and Academy linkage	X	X	X	X	-

2　専門家派遣実績

Dispatch of JICA Experts

Long-term Expert

(Chief Advisor)

Name　:　Dr. Minori Sano

Term　:　June 24, 1994 ~ October 10, 1998

(Coordinator)

Name　:　Mr. Keiji Higa

Term　:　June 1, 1994 ~ October 31, 1996

Name　:　Ms. Yuko Kishino

Term　:　October 10, 1996 ~ March 31, 1999

(Department of Electrical Engineering)

Name　:　Dr. Michiaki Ito

Position　:　Professor of Nagaoka University of Technology

Field　:　Telecommunication Engineering

Term　:　July 1, 1994 ~ August 31, 1995

Name　:　Dr. Toshihiko Noguchi

Position　:　Associate Professor of Nagaoka University of Technology

Field　:　Power Electronics

Term　:　May 24, 1996 ~ March 30, 1998

Name : Dr. Masahiro Iwahashi

Position : Associate Professor of Nagaoka University of Technology

Field : Digital Signal Processing

Term : March 25, 1998 ~ March 31, 1999

(Department of Industrial Engineering)

Name : Dr. Yutaka Yoshitani

Position : Formerly, Professor of Nagaoka University of Technology

Field : Industrial Engineering

Term : June 15, 1994 ~ August 15, 1995

Name : Dr. Hiroshi Ito

Position : Professor of Nagaoka University of Technology

Field : Machine Design Engineering, Industrial Machinery Engineering and Logistics

Term : July 22, 1995 ~ July 21, 1996

Name : Dr. Koji Takada

Position : Professor of Nagaoka University of Technology

Field : Production Engineering

Term : July 3,1997 ~ August 27, 1998

(Department of Civil Engineering)

Name : Dr. Hiroshi Mutsuyoshi

Position : Associate Professor of Saitama University (Presently, Professor)

Field : Concrete and Earthquake Engineering

Term : July 4, 1994 ~ August 26, 1995

Name : Dr. Hiroyuki Watanabe

Position : Professor of Saitama University

Field : Earthquake Engineering

Term : September 1, 1995 ~ September 25, 1996

Name : Dr. Katsutoshi Tanimoto

Position : Professor of Saitama University

Field : Coastal Engineering, Hydraulics and Structural Engineering

Term : September 16, 1996 ~ September 25, 1997

Name : Dr. Kunio Watanabe

Position : Professor of Graduate School of Science and Engineering, Saitama University

Field : Geological Engineering

Term : September 17,1997 ~ October 17, 1998

(Department of Chemical Engineering)

Name : Dr. Hiroo Niiyama

Position : Professor of Tokyo Institute of Technology

Field : Catalysis and Chemical Reaction Engineering

Term : June 15, 1994 ~ October 15, 1995

Name : Dr. Junjiro Kawasaki

Position : Professor of Tokyo Institute of Technology

Field : Separation and Mass Transfer

Term : October 15, 1995 ~ October 16, 1996

Name : Dr. Hidetoshi Sekiguchi

Position : Associate Professor of Tokyo Institute of Technology

Field : Heat Transfer and Energy Engineering

Term : October 1, 1996 ~ October 30, 1997

(Department of Mechanical Engineering)

None up to present.

Short-Term Expert

(Department of Electrical Engineering)

Name : Dr. Noriyoshi Kanbayashi

Position : Professor of Nagaoka University of Technology

Field : Circuit Theory

Term : October 28 ~ November 11, 1994

Activities : Lecture to and discussion with the Counterpart on Circuit Theory and Seminar on "Realization of Circuit Functions using operational Tranconductance Amplifiers and Grounded Capacitors".

Name : Dr. Toshinori Yoshikawa

Position : Professor of Nagaoka University of Technology

Field : Computer Application

Term : October 28 ~ November 11, 1994

Activities : Lecture to and Discussion with the Counterpart on Computer Application and Seminar on "Moments and their Application".

Name : Dr. Yukio Ichinose

Position : Professor of Nagaoka University of Technology

Field : Electronic Device and Material

Term : September 11 ~ December 20, 1995

Activities : Discussion with the Counterpart on the management of Department of Electrical Engineering

Name : Dr. Haruo Ogiwara

Position : Professor of Nagaoka University of Technology

Field : Telecommunication Engineering

Term : December 6 ~ 19, 1995

Activities : Lecture to and Discussion with the Counterpart on Telecommunication Engineering.

Name : Dr. Kiyoshi Oishi

Position : Associate Professor

Field : Control Engineering

Term : March 31 ~ April 12, 1996

Activities : Lecture to and Discussion with the Counterpart on Control Engineering

Name : Dr. Isao Takahashi

Position : Professor of Nagaoka University of Technology

Field : Power Electronics

Term : November 16 ~ 29, 1996

Activities : Lecture to and Discussion with the Counterpart on Power Electronics and Presentation of Paper at Power Electronics Seminar

Name : Dr. Toshio Kanbayashi

Position : Professor of Nakaoka University of Technology

Field : Opto-Electronics

Term : April 26 ~ May 17, 1997

Activities : Discussion with the counterpart on equipment, research activities and educational problems in opto-electronics, a special lecture to the counterpart on opto-electronics, preparation and attendance at the Advanced Opto-Electronics Seminar organized by JICA and Department of Electrical Engineering, etc.

Name : Mr. Toshihiko Kuroda

Position : Senior Instructor, NEC International Training

Field : Fiber Optic Transmission System

Term : October 5 ~ October 18, 1997

Activities : Providing the teaching staff of Thammasat University with the knowledge and technique to operate and test the fiber optic transmission system newly installed in laboratory.

Name : Dr. Toshihiko Noguchi

Position : Associate Professor of Nagaoka University of Technology

Field : Power Electronics

Term : July 25 ~ August 15, 1998

Activities : Technical guidance on senior student project, following up of research activities on power electronics, etc.

Name : Dr. Noriyoshi Kanbayashi

Position : Professor of Nagaoka University of Technology

Field : Circuit Theory

Term : September 23 ~ October 16, 1998

Activities : Lecture on analog signal processing in Seminar on Advanced Topics on Telecommunication and Computer, special lecture on analog circuit design, etc.

(Department of Industrial Engineering)

Name : Dr. Yasuzo Uchida

Position : President, Nagaoka University of Technology

Field : Administration and Management of University Affairs

Term : January 28 ~ February 2, 1995

Activities : Dicussion with the Counterpart on the Administration and Management of University Affairs

Name : Dr. Masaru Hattori

Position : Professor of Nagaoka University of Technology

Field : Heat Technology

Term : March 12 ~ 26, 1995

Activities : Lecture to and Discussion with the Counterpart on the effective utilization of Thermal Energy

Name : Dr. Shigeo Yanabe

Position : Professor of Nagaoka University of Technology

Field : Vibration Engineering

Term : March 7 ~ 21, 1995

Acitivities: Lecture to and Discussion with the Counterpart on Machine Vibration

Name : Mr. Tokihiro Sasahara

Position : General Manager of Komatsu Ltd., Technical Training Institute

Field : Quality Control

Term : February 26 ~ March 17, 1996

Activities : Lecture to and Discussion with counterparts on total quality control

Name : Dr. Ario Osato

Position : Professor of Nagaoka University of Technology

Field : System Engineering

Term : March 24 ~ April 13, 1996

Activities : Lecture to and Discussion with counterparts on system mehtodology and system application

Name : Mr. Mutsuo Takizawa

Position : General Manager of Komatsu Ltd., Technical Training Institute

Field : Production Management

Term : July 1 ~ 21, 1996

Activities : Lecture to and Discussion with counterparts on Japanese production system

Plant tour to The Concrete Product Aggregate Co., Ltd.

Name : Dr. Mitsuhiko Hasegawa

Position : Professor of Nagaoka University of Technology

Field : Engineering Design

Term : July 15, 1996 ~ November 14, 1996

Activities : General advice and guidance to the counterparts on educational and research activities during the absence of long-term expert.

Name : Dr. Kazuo Nakamura

Position : Professor of Nagaoka University of Technology

Field : Ergonomics

Term : November 7, 1996 ~ February 28, 1997

Activities: General advice and guidance to the counterparts on educational and research activities during the absence of long-term expert.

Name : Dr. Ario Osato

Position : Professor of Nagaoka University of Technology

Field : System Engineering

Term : February 24 ~ June 23, 1997

Activities:
- General advice and guidance to the counterparts on educational and research activities during the absence of long-term expert.
- Preparation and implementation of "Total Quality Management (TQM) Symposium" held on March 31, 1997

Name : Dr. Fumio Nishikawa

Position : Former Professor of Nagaoka University of Technology

Field : Total Quality Management

Term : August 18 ~ September 28, 1997

Activities : Discussions with the Counterpart on the General aspect of development of collaboration between IE Dept. and Thai and/or Japanese Industries. Supervising of the research works of Counterpart engaging in the field of TQM / QC.

Name : Mr.Kotsuka Koozuka

Position : Manager, International Relations Department, Union of Japanese Scientists and Engineers (JUSE)

Field : Total Quality Management (TQM)

Term : March 15 ~ March 21, 1998

Activities :
- Special lecture to counterpart on "Practical approach to TQM and QC activities"
- Participation in 2nd TQM Symposium as a guest speaker to present a paper entitled "Education and Training Program for TQM in JUSE"

Name : Dr. Koichi Yamada

Position : Associate Professor of Nagaoka University of Technology

Field : Knowledge Information Engineering

Term : August 17 ~ November 19, 1998

Activities : Discussion and advice on the senior student project, preparation and holding of Seminar on Intelligent Technology in Industrial Engineering, lecture on Diagnosis using Artificial Intelligence and Fuzzy Theory, etc.

(Department of Civil Engineering)

Name : Dr. Kazuyoshi Iwashita

Position : Associate Professor of Saitama University

Field : Soil and Earthquake Engineering

Term : December 6 ~ 18, 1994

Activities :
- Seminar on "Computer System in Universities" (on December 13)
- Seminar on "Distinct Element Simulation of Granular Materials" (on November 14)
- Discussion with counterparts on soil mechanics.
- Setting up of e-mail system

Name : Dr. Hiroyuki Watanabe

Position : Professor of Saitama University

Field : Earthquake Engineering

Term : March 4 ~ 18, 1995

Activities :
- Seminar on "Hyogo-Ken Nanbu Earthquake Damage" (on March 9)
- Discussion with counterparts on "University Management and Curriculum"
- Meeting with Dean, Head counterparts on "Graduate School in Universities"

Name : Dr. Yutaka Osawa

Position : Associate Professor of Saitama University, Department of Information and Computer Science, Faculty of Engineering

Field : Image Processing, Data Structure, Remotely-Sensed Image Analysis

Term : March 15 ~ April 1, 1996

Activities :
- Discussion on GIS system with a counterpart and the coordinator of Irrigation Engineering Center Project
- Seminar entitled "GIS (Geographic Information System) in Multi-Media Era"

Name : Dr. Katsutoshi Tanimoto

Position : Professor of Saitama University, Department of Civil and Environmental Engineering, Faculty of Engineering

Field : Coastal Engineering, Hydraulics and Structural Engineering

Term : March 27 ~ April 9, 1996

Activities :
- Discussion on Breakwater Structures with counterparts
- Seminar entitled "Method of Design for Water Front Structures and Submerged Structures-Design Load Estimation and Calculation Method for Sliding Distance of Structures-"

Name : Dr. Hiroshi Mutsuyoshi

Position : Professor of Saitama University, Department of Civil and Environmental Engineering, Faculty of Engineering

Special Field : Concrete and Earthquake Engineering

Term : July 31 ~ August 18, 1996

Activities :
- Teaching how to operate a Grant-Aid equipment "Loading System" to the counterparts
- Discussion and advice on both plans of researches and senior Project on RC and steel structures by counterparts
- Seminar entitled "Segmental External Prestressed concrete Structures"

Name : Dr. Yutaka Osawa

Position : Associate Professor of Saitama University, Department of Information and Computer Science, Faculty of Engineering

Field : Image Processing, Data Structure, Remotely-Sensed Image Analysis

Term : November 10 ~ 23, 1996

Activities :
- Guidance on Satellite Imagery and GIS in hydrology to the counterparts
- Seminar on GIS in multi-media era (Nov. 20, 1996)

Name : Dr. Takashi Asaeda

Position : Associate Professor of Saitama University

Field : Environmental Hydraulics

Term : July 14 ~ August 7, 1997

Activities : Discussion with Counterpart on stochastic modeling and simulation of streamflow process, aquatic environment and hydrodynamic model for flood prediction. Lecture on aquatic plant - phytoplankton nutrients system at Seminar on Water Resources and Environmental engineering held at Faculty of Engineering, Thammasat University.

Name : Dr. Hiroyuki Watanabe

Position : Professor of Saitama University

Field : Earthquake Engineering

Term : November 30 ~ December 27, 1997

Activities : Discussion and suggestion on research work using vibration test system, senior student projects in the field of structure engineering, international civil engineering seminar, ect. with relevant Counterpart. Special lecture on Earthquake Engineering.

Name : Dr. Hidehiko Kazama

Position : Associate Professor of Saitama University

Field : Soil Mechanics

Term : August 30 ~ October 2, 1998

Activities : Technical guidance on soft soil mechanics, lecture on recent studies on the micro-structure and mechanical properties of soft soil at Seminar on Recent progress on Soft Soil Mechanics, etc.

Name : Dr. Hiroshi Mutsuyoshi

Position : Professor of Saitama University

Field : Concrete Structural Engineering

Term : August 30 ~ September 19, 1998

Activities : Technical guidance and discussion on concrete structural engineering, lecture on collapse of concrete structures on soft ground by Hanshin Earthquake and introduction to earthquake resistant design at Seminar on Recent Progress on Soft Soil Mechanics

Name : Dr. Hiroki Yamaguchi

Position : Professor of Saitama University

Field : Structural Engineering

Term : September 12 ~ October 9, 1998

Activities : Technical guidance on structural engineering in general and lecture on improvement of seismic registant by passive and activie control techniques at International Seminar on Earthquake Resistant Design of Structures, 1998

(Department of Chemical Engineering)

Name : Dr. Junjiro Kawasaki

Position : Professor of Tokyo Institute of Technology

Field : Separation and Mass Transfer

Term : December 11 ~ 24, 1996

Activities : Lecture to and Discussion with the Counterpart on the Treatment of Waste Water with Activated Carbon

Name : Dr. Hiroyuki Kage

Position : Associate Professor of Kyushu Institute of Technology

Field : Separation and Environmental Engineering

Term : March 15 ~ April 9, 1995

Activities : Lecture to and Discussion with the Counterpart on Multi-Solute Adsorption from Dilute Aqueous Solution and Pollution Control Process

Name : Dr. Atsushi Kanzawa

Position : Professor of Tokyo Institute of Technology

Field : Heat Transfer and Energy Engineering

Term : July 20 ~ August 4, 1995

Activities : Lecture to and Discussion with the Counterpart and Students on Energy Balance in the Treatment of Waste Water with Activated Carbon

Name : Dr. Hidetoshi Sekiguchi

Position : Lecturer of Tokyo Institute of Technology

Field : Heat Transfer and Energy Engineering

Term : July 25 ~ August 16, 1995

Activities : Technical Guidance to and Discussion with the Counterpart on the Laboratory and Workshop Courses

Name : Dr. Toshio Kajiuchi

Position : Professor of Tokyo Institute of Technology

Field : Reology and Biochemical Engineering

Term : July 30 ~ August 15, 1996

Activities: • Open forum on present and future of Department of Chemical Engineering in/after JICA Project and on present and future of Chemical engineer on August 8 ~ 9, 1996
• Lecture and Discussion on senior student projects on August 12, 1996

Name : Dr. Hiroo Niiyama
Position : Professor of Tokyo Institute of Technology
Field : Catalysis and Chemical Reaction Engineering
Term : March 2 ~ March 18, 1997
Activities: General advices on the senior student projects and on the enhancement of research activities

Name : Dr. Junjiro Kawasaki
Position : Professor of Tokyo Institute of Technology
Field : Separation and Mass Transfer
Term : July 26 ~ August 15, 1997
Activities : Arrangement and discussion with Counterpart and the other related outside researchers on the promotion of joint research on the utilization of residue from agriculture / forestry / fishery and related industries.

Name : Mr. Ryuichi Egashira
Position : Lecturer of Tokyo Institute of Technology
Field : Separation and Mass Transfer
Term : Deceber 1 ~ December 27, 1997
Activities : Discussion and suggestion on senior student projects, laboratory course, etc. with relevant counterpart.

Name : Dr. Hiroo Niiyama

Position : Professor of Tokyo Institute of Technology

Field : Catalysis and Chemical Reaction Engineering

Term : December 20 ~ January 17, 1998

Activities: Discussion and suggestion on senior student projects, international higher engineering education seminar, etc. with relevant counterpart and JICA Expert.

Name : Dr. Hidetoshi Sekiguchi

Position : Associate Professor of Tokyo Institute of Technology

Field : Heat Transfer and Energy Engineering

Term : March 2 ~ March 23, 1998

Activities:
- Technical guidance to and discussion with counterpart on the senior student project
- Promotion of cooperative research with Khon Kaen University, Prince of Songkla University, Chulalongkorn University and Tokyo Institute of Technology on "Complementary Treatment and Utilization of Palm Oil and Fishery Industry Wastes"

Name : Dr. Junjiro Kawasaki

Position : Professor of Tokyo Institute of Technology

Field : Separation and Mass Transfer

Term : April 15 ~ July 25, 1998

Activities:
- Special lecture on "Prevention of Hammering in Steam Pipeline for Starting-up Operation
- Organization of the 2nd collaborative research meeting on "Complementary Treatment and Utilization of Palm Oil and Fishery Industry Wastes"
- Technical guidance to and discussion with counterpart on the senior student project

Name : Dr. Hidetoshi Sekiguchi

Position : Associate Professor of Tokyo Institute of Technology

Field : Heat Transfer and Energy Engineering

Term : August 6 ~ September 3, 1998

Activities: Technical guidance and advice on senior student project, collaborative research with the related universities, etc.

Name : Dr. Hiroo Niiyama

Position : Professor of Tokyo Institute of Technology

Field : Catalysis and Chemical Reaction Engineering

Term : August 26 ~ October 21, 1998

Activities: Technical guidance and discussion on senior student project, curriculum, management of department, future plan of department, etc.

(Department of Mechanical Engineering)

Name : Dr. Takehiro Ito

Position : Professor of Kyushu University

Field : Prime Mover Engineering

Term : October 23 ~ November 19, 1995

Activities: Improve the curriculum

: Improve the workshop

: Set the senior Project

: Seth the engineering research

: Give the suggestion for engineering research to counterparts

: Supervise the installation of testing device

: Discuss with counterparts on prime mover engineering

Name : Dr. Tohru Fukano

Position : Professor of Kyushu University

Field : Pneumatic and Hydraulic Control

Term : October 7 ~ November 3, 1996

Activities: Improve the curriculum

: Improve the workshop

: Set the senior Project

: Give the suggestion for engineering research to counterparts

: Supervise the installation of testing device

: Discussion with counterparts on pneumatic and hydraulic control

Name : Mr. Kuniaki Okumi

Position : Manager, NISSAN Motor Co., Ltd.

Field : Automobile Engineering

Term : February 6 ~ 18, 1995

Activities: Lecture to and Discussion with the Counterpart on Japanese Auto Industry, Quality Control, Development and Product Process and NISSAN's Intelligent Body Assembly System.

Name : Dr. Hisashi Horio

Position : Professor of Kobe University

Field : Agriculture Machinery

Term : July 23 ~ August 12, 1997

Activities : Advice and guidance to counterpart on the research activities of agriculture machine. Lecture on role of mechanical engineering in the field of agriculture, principle of agricultural machinery and agricultural vehicles engineering and automatic control of agricultural machinery. Lecture on automatic control of off-road vehicle at Workshop organized by Mechanical Engineering Department.

Name : Dr. Shigeo Yanabe

Position : Professor of Nagaoka University of Technology

Field : Vibration engineering

Term : September 1 ~ November 28, 1997

Activities : Discussion with and guidance to Counterpart on the policy of higher education in mechanical engineering and on the possibility of collaboration between ME Dept. and the other ME Depts (SIIT, Chulalongkorn University, etc.). Advice on the improvement of Lab / Workshop study. Discussion with the Counterpart on the topics of senior student project. Special lecture on "Dynamic Behavior of Slider Head of Compact Disk Reader."

Name : Dr. Masataka Shirakashi

Position : Professor of Nagaoka University of Technology

Field : Fluid Engineering

Term : December 8, 1997 ~ April 7, 1998

Activities:
- Discussion and suggestion on general aspects in developing educational and research activities, current research topics, curriculum, senior student projects, etc. with counterpart. Model lecture on "Fundamentals of Fluid Mechanics"
- Special lecture to counterpart on "Fluid Engineering II and Fluid Engineering III"
- Preparation of mechanical laboratories

Name : Dr. Yoshiharu Muto

Position : Professor of Nagaoka University of Technology

Field : Fracture Mechanics

Term : April 5 ~ August 20, 1998

Activities:
- Organization of "Special Seminar on Fracture and Fatigue" and "2nd NUT-TU Joint Seminar on Mechanical Engineering"
- Technical guidance to the counterpart on senior student project

Name : Dr. Atsushi Fujimori

Position : Associate Professor of Shizuoka University

Field : Control Engineering

Term : August 25 ~ November 6, 1998

Activities: Technical guidance on preparation of syllabus, textbook, laboratory course, research activities, etc.

(Installation of Equipment)

Name : Mr. Fumiya Hirakawa

Position : Epolead Service Inc.

Field : Installation of X-ray Fluorescence Analysis Equipment

Term : December 16 ~ 20, 1996

Name : Mr. Shuichi Tsukahara

Position : Shimadzu Scientific Engineering Service, Tokyo, Ltd.

Field : Installation of Gas Chromatograph

Term : February 24 ~ March 1, 1997

Name : Mr. Kiyoshi Otani

Position : Vice - Chief Manager, Yamato Engineering Co., Ltd.

Field : Installation and Operation

Term : August 26 ~ August 31, 1997

Activities : Installation of Heavy Metal Eliminator and guidance to Counterpart on its operation.

Name : Mr. Hideaki Yamanaka

Position : IMB Corporation

Field : Installation of Low Band Vibration Test System

Term : December 21 ~ December 25, 1997

Name : Mr. Masao Ito

Position : President, Seiken Inc.

Field : Installation of KO Consolidation Triaxial Test Apparatus

Term : March 15 ~ March 21, 1998

3　カウンターパート研修受入実績

Training of Counterpart Personnel in Japan

(Faculty of Engineering)

Name　:　Dr. Julsiri Jaroenpuntarnk

Position　:　Assistant Professor, Dean of Faculty of Engineering

Term　:　March 12 ～ March 26, 1998

Field　:　Management of University

Training Institutes & Supervisors in Japan:

1. Discussion on Administration for Faculty of Engineering at Ministry of Education of Japan.
2. Discussion on Enhancement of Activity in Education and Research at Tokyo Institute of Technology, Saitama University and Nagaoka University of Technology.
3. Discussion on Total Qualital Management and Productivity Improvement at Matsushita Electric Industrial Co., Ltd. and Toyota.

(Department of Electrical Engineering)

Name　:　Mr. Somchart Chokchaitam

Position　:　Lecturer

Term　:　March 10 ～ May 13, 1997

Field　:　Computer assisted simulation program generation environment, computer assisted mathematical modeling, scientific visualization, numerical grid generation, etc.

Training Institutes & Supervisors in Japan:

1. Dr. Shigeo Kawata, Nagaoka University of Technology.
2. Attendance at Conference on Information Processing and Conference on Computational Engineering and Science.

Name : Mr. Kitti Teleangkiatkajorn

Postion : Lecturer

Term : March 26 ~ May 30, 1998

Field : Robotics

Training Institutes & Supervisors in Japan:

1. Dr. Kiyoshi Oishi, Nagaoka Univerity of Technology.

Name : Mr. Wanchai Pijitrojana

Position : Lecturer

Term : April 19 ~ June 6, 1998

Field : Opto-Electronics

Training Institutes & Supervisors in Japan:

1. Prof. Toshio Kanbayashi, Nagaoka University of Technology.

(Department of Industrial Engineering)

Name : Mr. Somsak Chueakittisak

Position : Lecturer

Term : March 18, 1996 ~ May 26, 1996

Field : Robot Operation

: Automatic Control using Mechanical Engineering and

: Electrical Engineering

: System Engineering using Fuzzy Logic

Training Institutes & Supervisors in Japan:

1. JICA Osaka International Center
2. FANUC Robot School

   Robot Operation Department

   Manager, Mr. Masayoshi Iida
3. Nagaoka University of Technology

   (1) Department of Mechanical Engineering

   Associate Professor, Dr. Masajiro Abe

   (2) Department of Electrical and Electronic Engineering

   Associate Professor, Dr. Kiyoshi Oishi

   (3) Department of Planning and Management Science

   Professor, Dr. Ario Osato

Name : Ms. Parichat Chuenwatanakul

Position : Lecturer

Term : March 28, 1995 ~ May 31, 1995

Field : Just In Time

Training Institutes & Supervisors in Japan :

: Dr. Takao Enkawa, Professor of Tokyo Institute of Technology

Name : Ms. Montalee Sasananan

Position : Lecturer

Term : February 19 ~ March 22, 1997

Field : Operations Management in Manufacturing Industry

Training Institutes & Supervisors in Japan:

1. Prof.Mitsuhiko Hasegawa, Nagaoka University of Technology.
2. Visit to Engineering Associations, Tokyo Institute of Technology and Companies (Mitsubishi Heavy Industrial Ltd., Kubota Co., Ltd., etc.) to get relevant informations.

Name : Mr. Tritos Laosirihongthong

Position : Lecturer

Term : June 3 ~ August 6, 1997

Field : Total Quality Management

Training Institutes & Supervisors in Japan:

1. Asian Productivity Organization (APO)
2. The Association for Overseas Technical Scholarship (AOTS)
3. Dr. Kazuo Nakamura, Professor of Nagaoka University of Technology

(Department of Civil Engineering)

Name : Mr. Watanachai Smittakorn

Position : Lecturer

Term : March 29 ~ April 26, 1995

Field : Wind and Earthquake Engineering

Institute of Japan : Department of Civil and Environmental Engineering, Saitama University

Supervisor : Professor, Dr. Hiroki Yamaguchi

Name : Mr. Saharat Buddhawanna

Position : Lecturer

Term : November 5 ~ December 25, 1995

Field & Purpose : Concrete Engineering, To Master How to Use The Loading System

Training Organization : Saitama University, Department of Civil and Environmental Engineering

Supervisor : Associate Profess. Dr. Hiroshi Matsuyoshi

Name : Dr. Krittiya Lertpocasombut

Position : Lecturer

Term : June 4 ~ September 29, 1996

Field & Purpose : Environmental Engineering, To Master the Technique for Water Recycle with Membrane Filtration

Training Organization : The University of Tokyo, Department of Urban Engineering

Supervisor : Professor, Dr. Shinichiro Ohgaki and Professor, Dr. Tomonori Matsuo

Name : Mr. Chaisak Pisitpaibool

Position : Assistant Professor

Term : May 20 ~ September 27, 1997

Field : Dynamic analysis method. Experimental technique using shaking table. Experimental technique using loading system.

Training Institutes & Supervisors in Japan:

1. Dr. Hiroyuki Watanabe, Professor of Saitama University
2. Dr. Hiroshi Mutsuyoshi, Professor of Saitama University
3. Dr. Hiroki Yamaguchi, Professor of Saitama University

Name : Mr. Sayan Sirimontree

Position : Lecturer

Term : March 25 ~ October 1, 1998

Field : Structural Engineering

Training Institutes & Supervisors in Japan:

1. Dr. Hiroshi Mutsuyoshi, Saitama University.

Name : Dr. Chavalit Chaleeraktrakoon

Position : Lecturer

Term : May 5 ~ June 27, 1998

Field : River Engineering

Training Institutes & Supervisors in Japan:

1. Prof. Nobuyuki Tamai, University of Tokyo.

Name : Dr. Uruya Weesakul

Position : Assistant Professor

Term : May 11 ~ July 4, 1998

Field : Water Resources Management

Training Institutes & Supervisors in Japan:

1. Prof. Katsumi Mushiake, University of Tokyo
2. Prof. Shoji Fukuoka, Hiroshima University
3. Prof. Hiroyuki Watanabe, Saitama University

(Department of Chemical Engineering)

Name : Mr. Pongtorn Dhupathemiya

Position : Lecturer

Term : November 28, 1994 ~ February 25, 1995

Training Institute in Japan : Division of Energy and Hydrocarbon Chemistry, Kyoto University

Supervisor: Prof. Tomoyuki Inui

Name : Mr. Dhanit Phiphatpan

Position : Lecturer

Term : July 25, 1995 ~ September 30, 1995

Training Institute in Japan : Department of Chemical Engineering, Tokyo Institute of Technology

Supervisor: Prof. Junjiro Kawasaki

Name : Ms. Wanwisa Skolpap

Position : Lecturer

Term : March 20 ~ May 31, 1997

Field : Production and Characterization of Activated Carbon

Training Institutes & Supervisors in Japan:

1. Prof.Hiroo Niiyama, Tokyo Institute of Technology.
2. Visit to Kyushu University and attendance at the 7th Asian Chemical Congress in Hiroshima organized by the Federation of Asian Chemical Societies.

(Department of Mechanical Engineering)

None up to present.

4 機材供与実績

Provision of Machinery and Equipment

Only equipment and machinery delivered as of September 30, 1998 were listed down as follows:

Japanese Fiscal year	Registration No.	Name of Machinery and Equipment
1994	EE94T-001	Vector Signal Generator
	EE94T-002	π /4 DQPSKI-Q Generator
	IE94T-001	FFT Analyzer
	IE94T-002	Internal Printer
	IE94T-003	Microphone
	IE94T-004	Microphone Pre-Amplifier
	IE94T-005	Calibrator
	IE94T-006	Impulse Hammer
	CE94T-001	Data Logger
	CE94T-002	Switching Box
	CE94T-003	Metal Form
	CE94T-004	Pan type
	ChE94T-001	Portable COD Meter
	ChE94T-002	Zoom Stereo Microscope System
	ChE94T-003	Dissolved Oxygen Meter
	ChE94T-004	Portable pH Meter
	ChE94T-005	Electronic Recorder
	ChE94T-006	Water Bath Incubator
	ChE94T-007	Continuous Gas Monitoring Apparatus
	ChE94T-008	Centrifugal Particle Size Analyzer
1995	EE95T-001	Telecommunication System
	IE95T-001	Personal Computer DEC PC VENTURIS
	IE95T-002	Personal Computer DEC PC VENTURIS
	IE95T-003	Personal Computer DEC PC VENTURIS
	IE95T-004	Personal Computer DEC PC VENTURIS

Japanese Fiscal year	Registration No.	Name of Machinery and Equipment
1995	IE95T-005	Personal Computer DEC PC VENTURIS
	IE95T-006	Personal Computer DEC PC VENTURIS
	IE95T-007	Personal Computer DEC PC VENTURIS
	IE95T-008	Color Monitor 17inches
	IE95T-009	Color Monitor 17inches
	IE95T-010	Color Monitor 17inches
	IE95T-011	Color Monitor 17inches
	IE95T-012	Color Monitor 17inches
	IE95T-013	Color Monitor 17inches
	IE95T-014	Color Monitor 17inches
	IE95T-015	Note Type PC IBM Think Pad
	IE95T-016	Work Station SUN ULTRASPA
	IE95T-017	Laser Printer EPSON
	IE95T-018	UPS THAI MAXWELL
	IE95T-019	AUTO CAD Software
	IE95T-020	WINDOWS 95 Software
	IE95T-021	WINDOWS 95 Software
	IE95T-022	WINDOWS 95 Software
	IE95T-023	WINDOWS 95 Software
	IE95T-024	WINDOWS 95 Software
	IE95T-025	WINDOWS 95 Software
	IE95T-026	WINDOWS 95 Software
	IE95T-027	Oxyen Consumption Meter
	CE95T-001	Personal Computer DEC PC VENTURIS
	CE95T-002	Personal Computer DEC PC VENTURIS
	CE95T-003	Personal Computer DEC PC VENTURIS
	CE95T-004	Personal Computer DEC PC VENTURIS
	CE95T-005	Personal Computer DEC PC VENTURIS
	CE95T-006	Personal Computer DEC PC VENTURIS

Japanese Fiscal year	Registration No.	Name of Machinery and Equipment
1995	CE95T-007	Personal Computer DEC PC VENTURIS
	CE95T-008	Color Monitor DEC 14"
	CE95T-009	Color Monitor DEC 14"
	CE95T-010	Color Monitor DEC 14"
	CE95T-011	Color Monitor DEC 14"
	CE95T-012	Color Monitor DEC 14"
	CE95T-013	Color Monitor DEC 14"
	CE95T-014	Color Monitor DEC 14"
	CE95T-015	Note Type PC IBM Think Pad
	CE95T-016	Work Station SUN ULTRASPA
	CE95T-017	Tape Drive FRONT-ROAD 1/2"
	CE95T-018	Laser Printer EPSON
	CE95T-019	Laser Printer EPSON
	CE95T-020	Laser Printer EPSON
	CE95T-021	Laser Printer EPSON
	CE95T-022	Laser Printer EPSON
	CE95T-023	Laser Printer EPSON
	CE95T-024	CALCOMP DRAWINGBOARD
	CE95T-025	Scanner CALCOMP SCANPLUS III
	CE95T-026	TECHJET Color
	CE95T-027	UPA THAI MAXWELL
	CE95T-028	SOLARIS 2 Software
	CE95T-029	SOLARIS 2 Software Manual
	CE95T-030	WINDOW 95 Software
	CE95T-031	WINDOW 95 Software
	CE95T-032	WINDOW 95 Software
	CE95T-033	WINDOW 95 Software
	CE95T-034	WINDOW 95 Software
	CE95T-035	WINDOW 95 Software

Japanese Fiscal year	Registration No.	Name of Machinery and Equipment
1995	CE95T-036	WINDOW 95 Software
	CE95T-037	Microbiology Environmental Laboratory
	CE95T-038	Waste Water Sampler
	CE95T-039	Dynamic Strainmeter
	CE95T-040	Water Bath
	ChE95T-001	Personal Computer DEC PC VENTURIS
	ChE95T-002	Color Monitor DEC 14"
	ChE95T-004	Laser Printer EPSON
	ChE95T-005	WINDOWS 95 Software
	ChE95T-006	Gas Chromatography
	ChE95T-007	Bench Top X-ray Fluorescence
	ChE95T-008	Heavy Metal Eliminater
	ChE95T-009	Air Compressor
	ChE95T-010	Soap Film Meter
1996	EE96T-001	Digital Power Meter
	EE96T-002	Digital Oscilloscope
	EE96T-003	Votage Isolator
	EE96T-004	Current Probe System
	EE96T-005	Current Probe
	EE96T-006	Loading Rheostat
	EE96T-007	Slide Regulator
	EE96T-008	Personnal Computer
	EE96T-009	Digital Standard Pictures
	EE96T-010	Linear Power Supply AC Power Supply
	IE96T-001	Base (Computer Software)
	IE96T-002	Professional Statistics
	IE96T-003	Advanced Statistics
	IE96T-004	Tables (Computer Software)
	IE96T-005	Trends (Computer Software)

Japanese Fiscal year	Registration No.	Name of Machinery and Equipment
1996	IE96T-006	Categories (Computer Software)
	IE96T-008	QI Analyst 2.1 single-user license
	IE96T-009	Gage R&R 1.0 single-user license
	IE96T-010	HP Desk Jet Printer 1600CM
	IE96T-011	Fanuc Robot Arc Mate
	CE96T-001	KO Consolidation Triaxial Test Apparatus & Others
	CE96T-002	Contact Micron Strain Gauge & Adaptor with Carrying Case
	CE96T-003	Water Treatment Pilot Plant
	CE96T-004	Low Band Vibration Test System
	ChE96T-001	Incubator
	ChE96T-002	Electric Balance with Adaptor
	ChE96T-003	Crusher
	ChE96T-004	Crusher
	ChE96T-005	Water Still
	ChE96T-006	Cooler with Transfer
	ChE96T-007	Helium
	ChE96T-008	Nitrogen
	ChE96T-009	Hydrogen
	ChE96T-010	Oxygen
	ChE96T-011	Air
	ChE96T-012	Pressure Regulator
	ChE96T-013	PH Meter
	ChE96T-014	Liquid Pump
	ChE96T-015	Vacuum Pump
	ChE96T-016	Vacuum Pump
	ChE96T-017	Mass Flow Controller
	ChE96T-018	Mass Flow Controller

Japanese Fiscal year	Registration No.	Name of Machinery and Equipment
1996	ChE96T-019	Mass Flow Controller
	ChE96T-020	Differential Scanning
	ChE96T-021	Gas Chromatograph
	ChE96T-022	Ion Supttering Device
	ChE96T-023	Sartocon Slice Ultrafiltation Apparatus
1997	EE97T-001	Digital Power Meter
	EE97T-002	Digital Power Meter
	EE97T-003	Digital Oscilloscope
	EE97T-004	Univesal Counter
	EE97T-005	Digital Multimeter
	EE97T-006	Function Gemerator
	EE97T-007	Hybrid Recorder
	EE97T-008	Isolator
	EE97T-009	Control Cable
	EE97T-010	OpticalGlan-Thompson Polarizing Prisms
	EE97T-011	Quartz Retardation Plate
	EE97T-012	Mixed Analog/Digital Simulation Software
	EE97T-013	Currence Probe
	EE97T-014	LCR Meter
	EE97T-015	Liad Resistor
	EE97T-016	Slide Regulator
	EE97T-017	DSP Board
	EE97T-018	Software With DSK Starter Kit
	EE97T-019	Rom Writer
	EE97T-020	Solar Battery
	IE97T-001	Computer Software for Decision Support
	IE97T-002	Muscle Tester
	IE97T-003	Finite Element Analysis Software Ansys

Japanese Fiscal year	Registration No.	Name of Machinery and Equipment
1997	CE97T-001	SAS/ETS Software SAS System
	CE97T-002	Aggregate Impact Test Value Apparatus Matest
	CE97T-003	Portable Digital PH Meter and Thermoneter Matest
	CE97T-004	Length Comparator + Reference Bar
	CE97T-005	Portable Electronic Digital Thermometer Matest
	CE97T-006	Laboratory Vaporizer with Humidistat Matest
	CE97T-007	Strain Gauge Matest
	CE97T-008	Amplifier Dynamic Strain
	CE97T-009	Accelerometer
	CE97T-010	Charge Amplifier
	CE97T-011	A/D Board
	CE97T-012	Personal Computer PC5200
	CE97T-013	Displacement Meter
	CE97T-014	Displacement Meter
	CE97T-015	Analog Controller RJ 800
	CE97T-016	Software 776670-03 Lab View
	CE97T-017	Software 776672-01 Lab View
	CE97T-018	Personal Computer 17 Inch. G5-200
	CE97T-019	Personal Computer 17 Inch. G5-200
	CE97T-020	Personal Computer 17 Inch. G5-200
	CE97T-021	Personal Computer 17 Inch. G5-200
	CE97T-022	Personal Computer 17 Inch. G5-200
	CE97T-023	Personal Computer 17 Inch. G5-200
	CE97T-024	Printer Canon Lasor LBP-830
	CE97T-025	Printer Canon Lasor LBP-830

Japanese Fiscal year	Registration No.	Name of Machinery and Equipment
1997	CE97T-026	Printer Canon Lasor LBP-830
	CE97T-027	Printer Canon Lasor LBP-830
	CE97T-028	Structure and Fluid Analysis
	ChE97T-001	Surface Area Analizer "Quantasorb"
	ChE97T-002	TPD-TPR Apparatus
	ChE97T-003	HPLC Pump
	ChE97T-004	Colling Device
	ChE97T-005	Thomal Reactor
	ChE97T-006	Infrared Furnace
	ChE97T-007	Temperature Regulator
	ChE97T-008	Transformer with case
	ME97T-001	Portable Non-contact Thermometer "OPTEX"
	ME97T-002	Rotational Viscometer
	ME97T-003	Compaq Presario
	ME97T-004	Compaq Presario
	ME97T-005	Scanner UMAX
	ME97T-006	Data Logger
	ME97T-008	Data Analyzer with standard accessories, Single Conditioner
	ME97T-009	Basement for single conditioner

5 工学部教官配置状況

. Faculty profile as of July 1,1998

Dept.	Classification by degrees of faculty member			Staying	Studying abroad	Total
	B	M	D			
EE	6	13	1	13	7	20
IE	4	11	2	8	9	17
CE	1	11	δ	11	9	20
ChE	4	9	1	7	7	14
ME	2	8	2	9	3	12
TOTAL	17	52	14	48	35	83

B : Bachelor M : Master D : Doctor

. Future staffing plan

In terms of the number of faculty members described in a, b and c. above, FOE has worked out five-year master plan to increase the number of academic staff every year to 16,18,9,7 and 4persons, respectively covering a period of five years starting from 1997 and ending in 2001 Thai fiscal year.

6 英文評価サマリー（評価用ＰＤＭ）

Evaluation Summary for the Project to Enhance the Capability of the Faculty of Engineering at Thammasat University

Narrative Summary	Objective Verifiable Indicators	Means of Verification	Important Assumptions
Overall Goal The Faculty of Engineering at the Thammasat University becomes one of the leading faculties in the engineering field of Thailand with providing highly qualified engineers to Thai industry.	· Number of contracted researches and consulting works with private sector is large among the universities in Thailand. · Competition for entrance examination is high among the universities in Thailand. · Average and minimum score for entrance examination is high among the universities in Thailand. · Large number of professional engineers are provided for Thai industry.	· Data from the Ministry of University Affairs · Data from the Faculty of Engineering	· Industrial development of Thailand continues with large needs for qualified engineers.
Project Purpose The Faculty of Engineering at the Thammasat University acquires enhanced capability.	· Post graduate courses are established, or necessary conditions for them are satisfied. (Same indicators for "outputs" can be also applied as indicators for "project purpose". See the note under the matrix for further explanation.)	· Data from the Faculty of Engineering	· Budget allocation for the Faculty is not decreased largely. · Employment conditions for academic staff are not worsened.
Outputs A. Academic staff have capabilities to educate qualified graduates by giving lectures, laboratory / workshop, guidance to senior student projects, etc. of high quality.	A1 Qualified classes are given based on adequate curriculum and syllabuses. A2 Text books and teaching material are adequate and effectively utilized. A3 Facilities and equipment for education are sufficient and effectively utilized. A4 Number of senior students research projects presented by academic papers. A5 High proportion of graduates proceed to post-graduate programs. A6 Students are satisfied with the education program and the quality of classes.	· Data from the Faculty of Engineering · Interview with the academy staff · Questionnaire survey and interview with students	
B. Academic staff have research capabilities to promote collaboration with domestic and international institutions and make contribution to industrial development of the country through education and research activities.	B1 Number of academic papers presented at international level. B2 Number of academic publications by the academic staff. B3 Number and amount of contracted research projects and consulting works. B4 Number of collaborative research projects with related institutions.		
C. Administration system of the Faculty is improved.	C1 The faculty meeting is regularly held and effectively works. C2 Annual budget is prepared timely and properly. C3 Facilities and equipments are efficiently used and properly maintained. C4 Research activities are promoted and coordinated efficiently through the grouping of academic staff.		

Activities	Inputs	
A. Improvement of curriculum, course development (model lectures, improvement of syllabuses), improvement of teaching methods (improvement of teaching material, field trips, workshops), improvement of experiment and exercize (preparation of manuals, supervision of laboratory setting-up), assistance in supervision of senior student projects, development of teaching material and laboratory instructions. B. Research capability improvement (grouping of academic staff, participation to academic meetings, presentation of papers, academic exchanges, promotion of collaboration) C. Training of technicians, operation and maintenance of equipment and machinery, research grouping and guidance, preparation for post graduate courses, seminar on faculty administration, preparation of annual report, preparation of human resources development plan, exchange with foreign universities.	Japanese Side · long-term experts · short-term experts · training of C/P · provision of equipment · local cost support	Thai Side · counterpart personnel · administration staff · building and facilities · administration budget

Important Assumptions
· C/Ps who received training in Japan or studied abroad stay in the Faculty. · C/Ps are not much overloaded by those activities not related to the Project.
Preconditions · Necessary number of academic staff are recruited. · Students are enrolled.

Note : In this matrix, the project purpose and the "Outputs" are defined so that the outputs explains the three major aspects of the "Project Purpose" to be achieved by the Project. Therefore, the indicators for the outputs can be also regarded as the indicators for the project purpose. For the same reason, no "Important Assumptions" are described at the output level.

JICA