タイ国タマサート大学工学部
拡充計画プロジェクト
巡回指導調査報告書

平成9年7月
(1997年7月)

国際協力事業団
社会開発協力部

タイ国タマサート大学工学部
拡充計画プロジェクト
巡回指導調査報告書

平成９年７月
（１９９７年７月）

国際協力事業団
社会開発協力部

序　　文

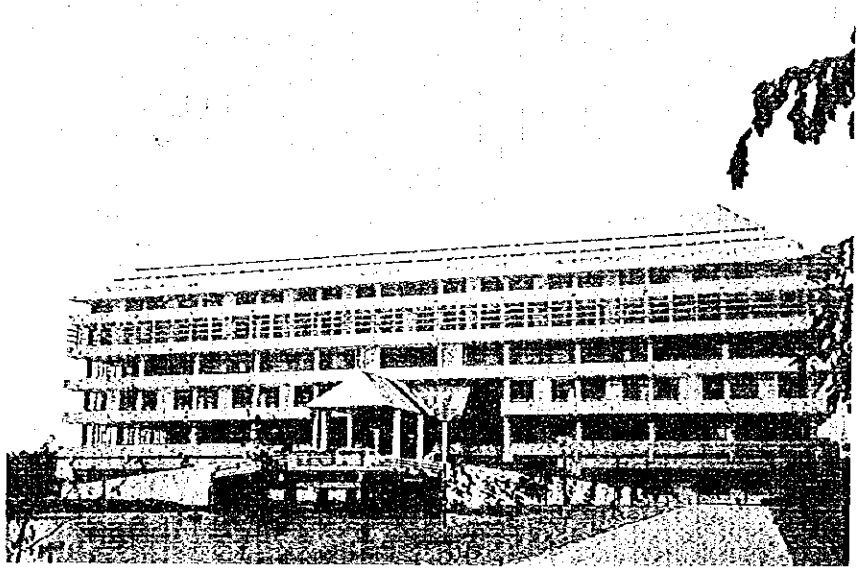
タイ国政府は経済発展に伴うエンジニア不足に対応するため、国立・私立大学の工学部拡充を急いでおり、人文・社会科学系の名門・タマサート大学の工学部新設に関して、わが国に無償資金及び技術協力を求めてきた。

これを受けて日本国政府は1994年度に6.64億円の無償資金協力を実施し、他方国際協力事業団は1992年6月の基礎調査をはじめとする各種調査を重ねた結果、1994年3月に討議議事録（R／D）の署名を取り交わして、同年4月1日から5年間のプロジェクト方式技術協力を実施している。今般は協力開始から3年余を経てプロジェクトの中間点を迎えたところから、これまでの活動・投入実績、計画達成度等を確認・評価し、必要があれば協力計画を軌道修正する目的で、1997年（平成9年）6月2日から同10日まで、埼玉大学大学院政策科学研究科研究科長 西野文雄氏を団長とする巡回指導調査団を現地に派遣した。その結果、かねての懸案であった教員の充足も逐次進展し、工学部教育の充実が成果を上げていることが明らかになった。

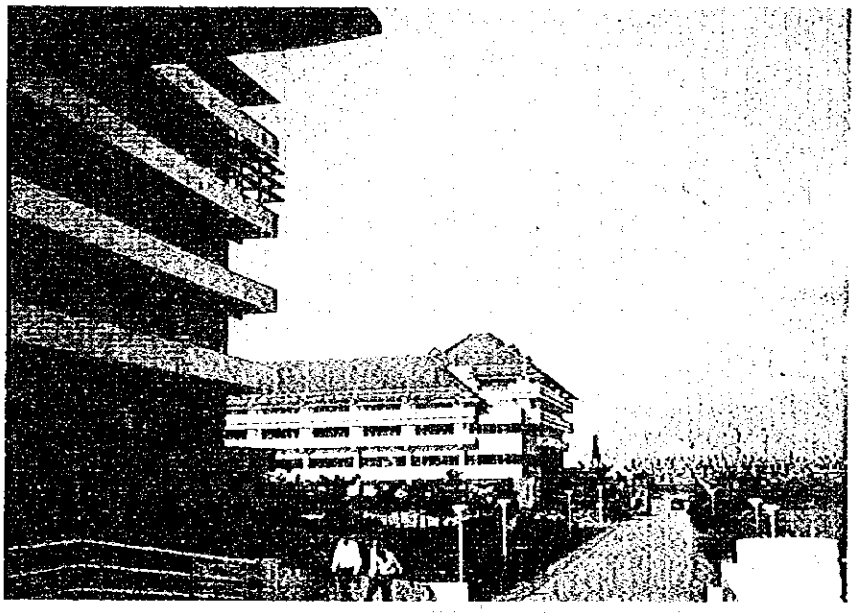
本報告書は同調査団の調査・協議結果を取りまとめたもので、今後のプロジェクト実施に当たって広く活用されることを願うものである。ここに、調査団の各位をはじめ、ご協力いただいた外務省、文部省、在タイ国日本大使館など関係各機関の方々に深く感謝するとともに、更なるご支援・ご協力をお願いする次第である。

平成9年7月

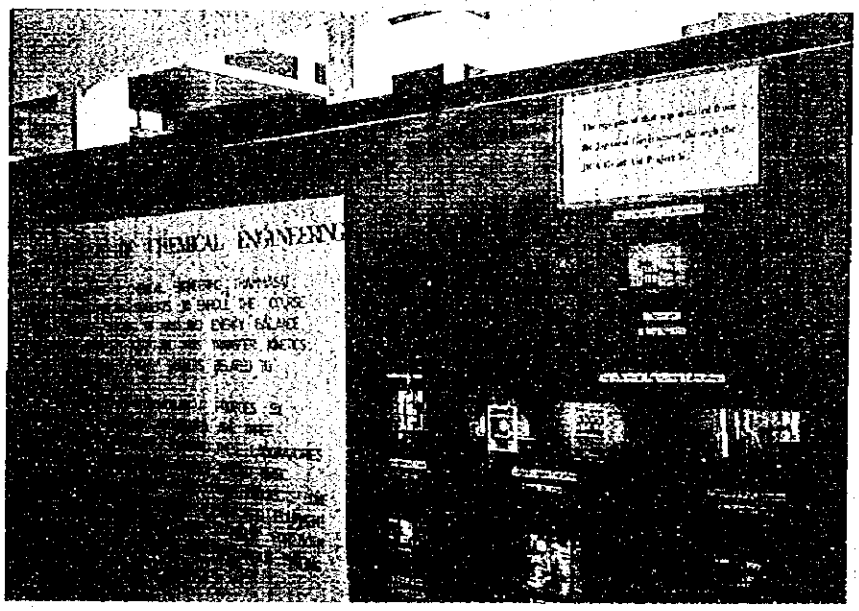
国際協力事業団
社会開発協力部
部長　神田道男



タマサート大学工学部
全景

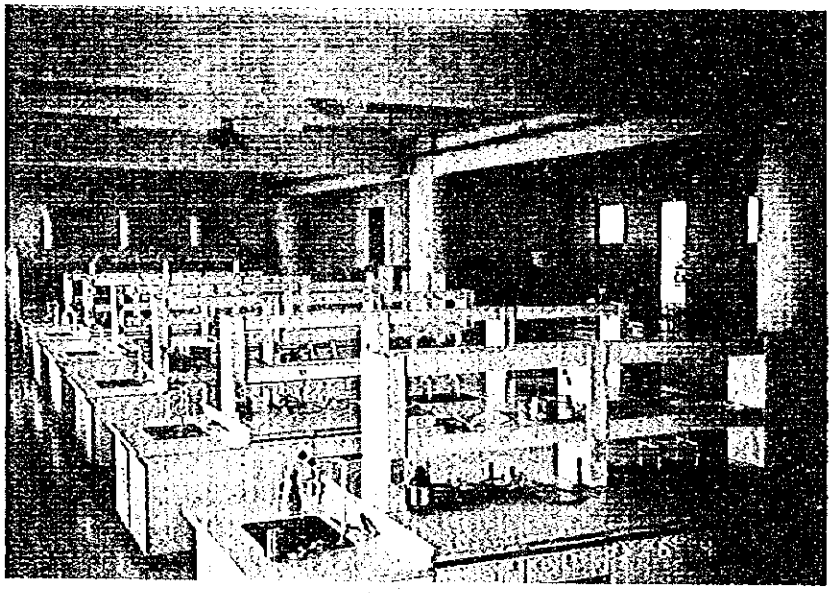


手前:タマサート大学工学部
奥　:Sirinthorn International
　　Institute of Technology



無償機材の展示パネル
（他学科についても玄関ロビーにこのようなパネルが設置されており、機材の利用について紹介されている）

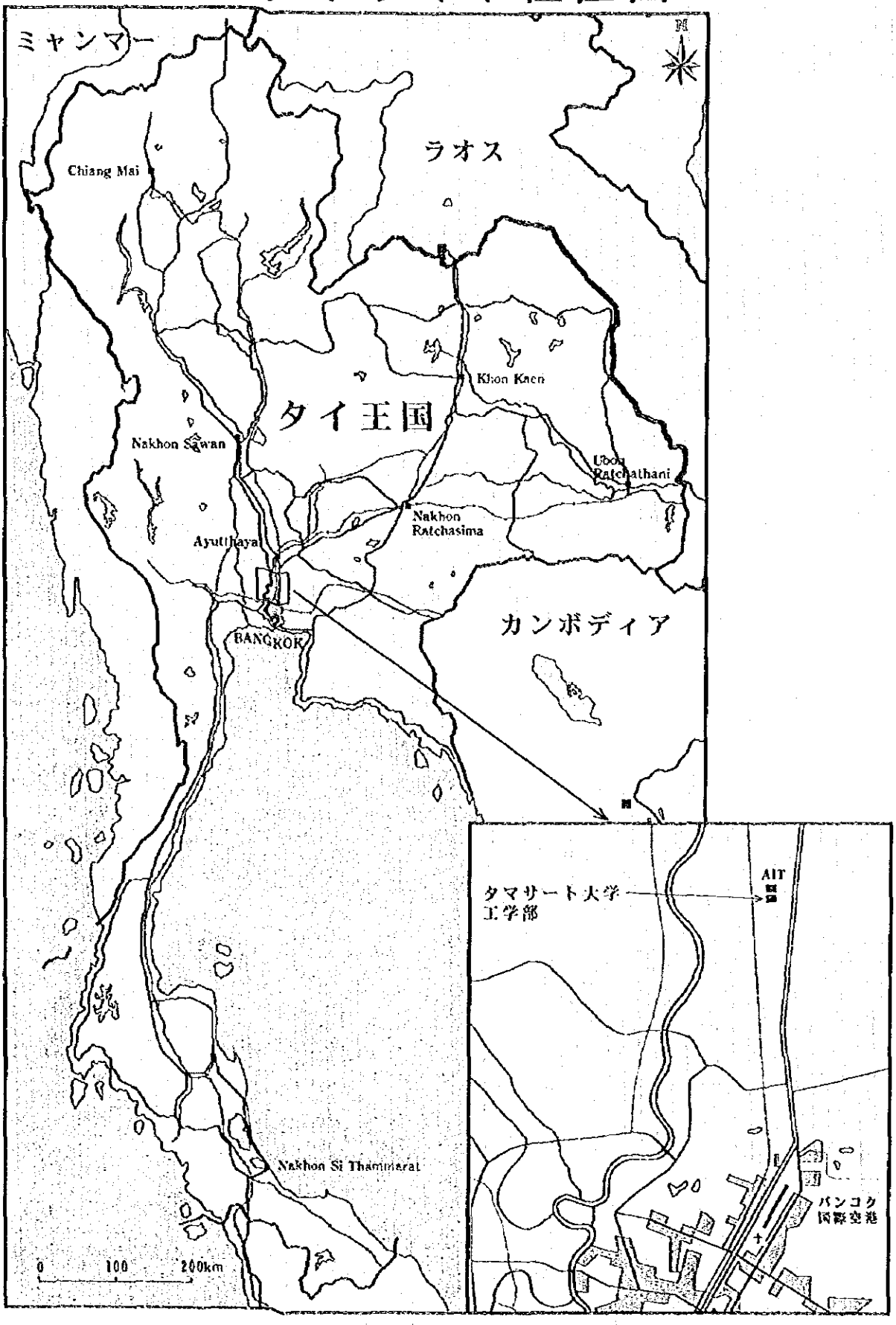
生産工学科の
CNCマシン

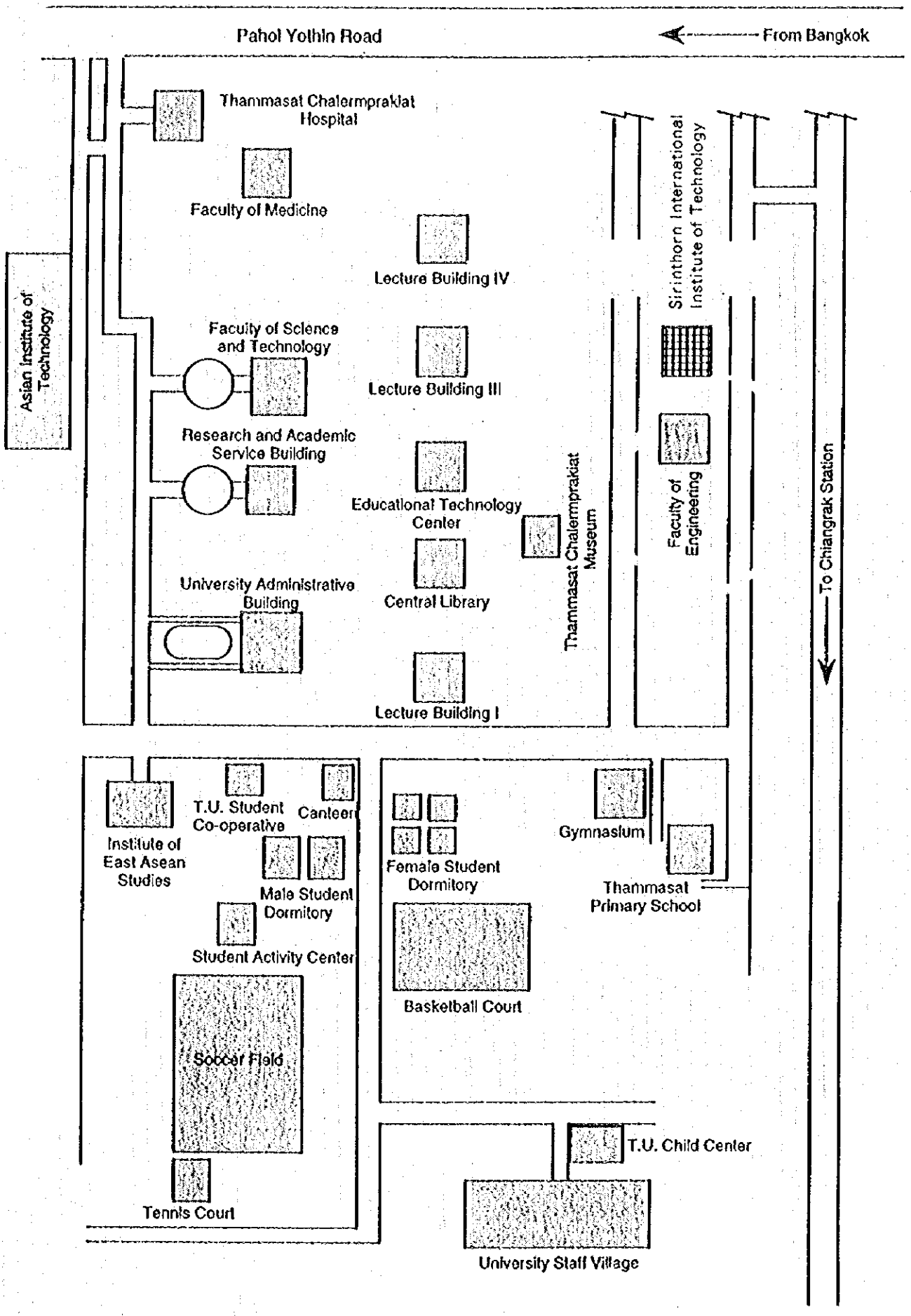


化学工学科実験室
整理整頓、物品管理
がよく行われている

タイ側との総括協議

プロジェクトサイト位置図




Pahol Yothin Road
From Bangkok
Thammasat Chalermpraklat Hospital
Faculty of Medicine
Asian Institute of Technology
Lecture Building IV
Faculty of Science and Technology
Lecture Building III
Research and Academic Service Building
Educational Technology Center
Thammasat Chalermprakiat Museum
University Administrative Building
Central Library
Lecture Building I
Sirinthorn International Institute of Technology
Faculty of Engineering
To Chiangrak Station
Institute of East Asean Studies
T.U. Student Co-operative
Canteen
Male Student Dormitory
Student Activity Center
Soccer Field
Tennis Court
Female Student Dormitory
Basketball Court
Gymnasium
Thammasat Primary School
T.U. Child Center
University Staff Village

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付属資料

1．巡回指導調査団の派遣

1－1　派遣の経緯と目的

タイ国では1980年代後半以降の経済発展に伴い、工業部門におけるエンジニアの必要性が非常に高まっている。この現状に対応するため、タイ国政府は、第７次国家開発計画（1992年～1996年）で科学技術系の人材養成を重点課題の一つに取り上げ、これに基づいて国立大学８校及び私立大学数校に工学部の新設を計画した。人文・社会学系の名門大学であるタマサート大学では、大学省により工学部の新設が計画され、1989年７月、日本に対し、工学教育機材の整備を目的とする無償資金協力と新設工学部の教官育成のための技術協力が要請された。

以上の背景のもと、日本政府は1993年度に6.64億円規模の無償資金協力を行い、1994年４月１日から５年間の協力期間でプロジェクト方式技術協力を実施中である。

プロ技の協力内容は、同工学部の電気工学科、生産工学科、土木工学科、機械工学科、化学工学科を対象として、各学科の教官の教授能力の向上、教官の研究能力の向上及び学部の管理運営指導を図るもので、それぞれの技術移転を専門家を通じて実施中であり、現在３年が経過し、協力の中間点を迎えている。

今回の調査団は、これまでの活動実績、投入実績、計画達成度を調査、確認し、これらの実績を①目標達成度　②実施の効率性　③計画の妥当性　④自立発展性――の観点から評価する。その結果、計画どおりに達成されていない分野や問題点があれば、その要因を分析し、必要に応じて協力終了までの計画案の軌道修正を検討するとともに、今後のプロジェクト実施に必要な提言を行うことを目的として派遣された。

調査内容・項目は以下のとおりである。

① タイ側のプロジェクト運営体制の確認
　a）タイ側組織機構の現状
　b）カウンターパート（C／P）配置状況
　c）予算措置の状況
② プロジェクト活動の進捗状況の確認
　各分野の投入実績、活動実績、計画達成度の調査・確認
③ 機材の使用状況、維持管理状況の調査
④ 1997年度年間活動計画、今後の全体活動計画の協議
⑤ その他個別検討事項
　a）Sirinthorn International Institute of Technology (SIIT)との関係、大学院開設について
　b）第２回アセアン高等教育ネットワーク国際セミナーについて

c）機械工学科への協力について

d）研究活動の活性化に関する意見交換

1－2　調査団の構成

氏　名	分　野	所　属
西野　文雄	総括／団長	埼玉大学 大学院政策科学研究科　研究科長
北尾　善信	大学教育	文部省 学術国際局教育文化交流室　海外協力官
堤　和男	化学工学	豊橋技術科学大学 副学長
小沼　義昭	機械／生産工学	豊橋技術科学大学 工学部機械系　教授
飯田　誠之	電気工学	長岡技術科学大学 工学部電気系　教授
渡辺　元治	協力企画	JICA社会開発協力部　社会開発協力第一課

1－3　調査日程

日順	月日(曜日)	移動及び業務	備　考
1	6/2(月)	西野団長、北尾、飯田、渡辺団員：東京→バンコク 堤、小沼団員：名古屋→バンコク 調査団・専門家チームの打合せ	Land Mark Hotel
2	6/3(火)	JICA事務所打合せ 日本国大使館表敬 大学省次官表敬 経済技術協力局表敬 クマサート大学　学長表敬	AIT Center
3	6/4(水)	長期専門家との意見交換 施設機材の状況の確認	AIT Center
4	6/5(木)	タマサート大学側との全体協議 各学科との個別協議	AIT Center
5	6/6(金)	Sirinthorn International Institute of Technology (SIIT)視察 Asian Institute of Technology (AIT) 視察 ミニッツについての打合せ	Land Mark Hotel
6	6/7(土)	団内打合せ・資料整理	〃
7	6/8(日)	団内打合せ・資料整理	〃
8	6/9(月)	タマサート大学との総括協議 ミニッツ署名・調査団主催招宴 JICA事務所 パトムワン工業高専プロジェクトの視察 北尾団員　バンコク→東京	〃
9	6/10(火)	西野団長、飯田、渡辺団員：バンコク→東京 堤、小沼団員　　：バンコク→名古屋	

1－4　主要面談者

（1）タイ側

大学省

Dr. Vanchai Sirichana	Permanent Secretary

首相府　経済技術協力局

Ms. Chutima Wiseswitayawet	Chief, Japan Sub-division External Cooperation Division I
Ms. Chittimas Kongpolprom	Chief, Project Analysis Sub-division, Planning Division
Ms. Hataichanok Siriwadhnakul	Programe Officer, Japan Sub-division External Cooperation Division I

タマサート大学

Prof. Noranit Setabutr	Rector

タマサート大学工学部

Dr. Somnuke Praparntanatorn	Dean
Dr. Uruya Weesakul	Deputy Dean for Foreign Affairs
Dr. Chavalit Chaleeraktrakoon	Assistant Dean for Academics Affairs
Mr. Prodpran Siritheerasas	Assosiate Dean for Administrative Affairs
Mr. Pongsak Mahachoklertwattana	Assistant Dean for Planning and Information
Ms. Jaree Chaichang	Head of Electrical Engineering Department
Dr. Julsiri Jaroenpantarak	Head of Industrial Engineering Department
Dr. Virote Boonyapinyo	Head of Civil Engineering Department
Ms. Wanwisa Skolpap	Head of Chemical Engineering Department
Mr. Chatchai Marinadee	On behalf of Head of Mechanical Engineering Department

（2）日本側

タマサート大学工学部拡充計画専門家チーム

佐野　美則	チーフアドバイザー
岸野　優子	業務調整員
谷本　勝利	土木工学長期専門家

野口　敏彦	電気工学長期専門家
関口　秀俊	化学工学長期専門家
大里　有生	生産工学短期専門家

在タイ日本大使館

井野　靖久	一等書記官
野崎　謙二	一等書記官

国際協力事業団タイ事務所

隅田　栄亮	所長
田和美代子	所員

2．要　約

タイ側の実施体制は前回（２年前）の調査団派遣時には、44名であった教官が66名になっており、またタイ側も通常の給与以外の財源により賃金のアップを図るなど、人材の確保に努めている。

活動の実績としては、土木工学科を中心に、論文の作成、学会出席・発表、共同研究などにより研究活動の成果が相当数出てきているところである。教育活動に関しては、シラバスの作成、教材の作成への指導を日本側が行っており、学科ごとに差はあるものの、活動はおおむね順調に進捗しているといえる。

こうした活動の結果として、土木工学科及び生産工学科については大学院教育を開始しており、更にプロジェクトを契機として、埼玉大学、東京工業大学がそれぞれ、土木分野、化学分野で交流協定を締結した。

以上のように活動が進捗しつつある現状に関し、タイ側から学会参加、研究費用への支援などについての要請があった。調査団からは、現地業務費の中で対応することは可能である旨答えている。

体制整備が遅れていた機械工学科は本年６月から３年生までが充足される予定であり、来年の４年生の進級に伴う卒業研究への支援の必要性から、長期専門家の要請が提出されているところである。日本側としては、担当国内委員を中心に人選にあたっているが、平成９年度中の長期専門家の派遣は困難な見通しである。今年度については、長期専門家の代替として短期専門家を派遣する予定であり、その分野などについては今後の検討課題となっている。

Sirinthorn International Institute of Technology (SIIT)と工学部の関連については、土木工学科が共同研究を進めており、共同プログラムによる大学院教育についても協力関係が進捗している。電気工学分野については、SIITの教官が学生を連れてきて実験を行っている。生産工学分野については、将来的には共同研究などを行いたい意向である。従来から指摘されている工学部の無償資金協力機材をSIITも使用する問題は、機材の維持管理、損傷したときの補償の問題、ワークショップの鍵の管理問題などから、SIIT側が支障を感じているようであるが、少なくとも工学部側はSIITの使用を妨げるものではないとのスタンスである。日本側としては、工学部の活動の強化のために近隣のリソースを活用する観点から、研究活動強化費により共同研究を支援する用意があり、このことが結果的にSIITとの関係の強化と機材の活用の促進に資するものと考えている。

昨年度インドネシアで第１回が実施され、今年度はタマサート大学主導で実施される予定のアセアン高等教育ネットワーク国際セミナーに関し、国際協力事業団から派遣された調査団員、専門家チーム、タマサート大学工学部長、副学部長との間で非公式に意見交換を行った。

3．プロジェクト実施状況

3－1　プロジェクトの進捗状況

（1）日本側投入実績

プロジェクトの開始から3年間に、日本側は長期専門家13名（チーフアドバイザー、業務調整員、土木工学・化学工学・電気工学・生産工学の各長期専門家）を派遣したのをはじめ、32名にのぼる短期専門家を派遣した。

一方、タイ側のカウンターパート10名を日本における研修に受け入れた。

またプロジェクトの円滑な展開のため、統計約1億4,900万円にのぼる資機材を供与した（これらの投入実績については、付属資料2．日本側投入実績及び機材の利用・管理状況表を参照）。

さらにローカルコスト負担分として、約2,800万円を支出した。

（2）タイ側投入実績

1994～1997年タイ会計年度の間に、タイ国政府は工学部予算として約2億8,600万バーツを支出した。

また、プロジェクト活動のために、統計66名の教官を配置した。

3－2　活動状況と成果の達成度

3－2－1　総括

プロジェクト実施にあたっては、教官を必要なだけ集められるかどうかが懸念された。この点、日本側・タイ側双方とも、タマサート大学工学部がバンコク首都圏内の好位置にあるところから選任は可能とみていたが、工業化が急速に進み、エンジニア需要が急増したことから民間給与水準が向上して、公務員給与との間に大きな開きが出たこと、タイ工学界の重鎮であった工学部長がその職を離れたなどの事情が重なり、選任を難しくした。しかしタイ側が通常の給与以外の財源による賃金アップを図ったなどから事態が改善され、教官数は逐次充足されてきた。

プロジェクトの成果の一つは、タマサート大学工学部と埼玉大学及び東京工業大学との間で研究及び学生の交流協定が結ばれたことである。また、土木工学科と生産工学科の大学院教育が開始され、他の学科もその計画を立てつつある。

3－2－2　電気工学科

短期専門家を中心にカウンターパート教官を対象にした電気工学の各分野に対応する特別

セミナー４回（電気回路、情報処理、電力、オプトエレクトロニクス）を開催している。卒業研究に対応する最終学年次学生（４年生）の特別プロジェクトを行う４名の学生に対し長期専門家が直接特別講義を行い、日本的な卒業研究の例を示して実績を作ろうとしている。パワーエレクトロニクス分野を例に、学生実験用の部屋と研究中心の部屋の機能を分け、研究環境の向上を目的とした研究室作りに取り組んでいる。

具体的成果として、カウンターパート教官（単著）による授業用教科書１冊の出版、国際学術会議でのカウンターパートと短期専門家共著の論文採択１件、カウンターパート単著の論文採択１件などの実績が出てきている。これらの実績は、在籍の教官の年齢・経験及び構成を考えれば、現在のプロジェクト段階としてはほぼ期待どおりのレベルで、一応満足すべきものであると言えよう。

電気工学科として初めて日本でカウンターパートの研修を経験した教官が、本調査団訪問の直前に帰国していたが、研修の効果は顕著で、周囲の教官にもよい影響を与えていると判断できた。タイの電気工学科側からカウンターパート研修受け入れ数増加の要求が出ていたが、これはそうした効果の一つの表れとみなされる。

供与機材の活用については、専ら学生実験を想定して供与された機材は有効に活用されており、問題がないと認められる。他方、卒業研究レベル以上を想定して納入されたとみられる機材の活用については、卒業研究に対応する実験にも国内留学中のカウンターパート教官の学位取得のため実験にも用いられ、いわばフル稼働状態で、極めて有効に利用されている一方で、海外留学中の教官の帰国待ちとの説明を受けた機材もある。現在のような教官配置（留学中の教官と大学で勤務中の教官の比率）を考えれば、ある程度やむを得ないと言わざるを得ない。

３－２－３　生産工学科

生産工学科には1997年４月現在16名の教員が在籍しており、そのうち２名が博士号取得者、６名が修士号取得者である。ただし、７名の教員は国内あるいは国外に留学中である。本プロジェクトが発足した1995年６月における教員数は９名であり、両者を比較すると、生産工学科に関しては教員数は順調に増加している。現在留学中の教員が学位を取得して大学に戻ってくれば、教員組織に関してはほぼ満足しうる状態になると思われる。

カウンターパートの教育能力を高めることは本プロジェクトの最も重要な目的の一つであるが、そのために長期専門家及び短期専門家によって種々のセミナーが開催され、生産管理、品質管理、人間工学などについての講義・講演が行われた。これらのセミナーに参加することによって、カウンターパートはその内容を習得するとともに、教授法についての学習もできるように配慮されている。

生産工学科は既に４回の卒業生を社会へ送り出しており、当学科の教官は既に卒業研究を効果的に指導する能力を習得しているものと思われる。学術研究は必ずしも活発とは言えないが、活発化するきざしは見られ、教官の学会への参加も徐々に増加しつつある。

本プロジェクトによって供与された設備は、生産工学科の教育・研究用として適切であると考えられる。また、管理状態は良好であり、有効に利用されている。

生産工学科では"Quality Control" "Material Science"と題する２冊の教科書がカウンターパートによって出版され、合計10回のセミナーが開かれたが、その中でも1997年３月に当生産工学科の主催で行われた「TQM（全社的品質管理）シンポジウム」は注目される。このシンポジウムは学内のみならず他大学、企業、関連機関へも呼びかけ、65名の参加者を得て開催されたもので、生産工学科の教育・研究活動の今後の発展への寄与が期待されるとともに、現在の教員組織の行動力を示す１例であると思われる。その他の成果としては、２編の学術論文が国内の学会で発表され、４編の論文がタマサート大学工学部のAnnual Research Reportに掲載された。

生産工学科においては教育体制は既にほぼ整備されたと見受けられる。研究活動もまた活性化されつつあるが、必ずしも十分とは言えず、次なる段階として学外における学術的活動を更に活性化することが望まれる。以上、総合的にみて、生産工学科においては1997年の修士過程開設の準備は整っていると評価され、修士過程設置により、更なる発展が期待される。

３－２－４　土木工学科

当初予定の20名（後に25名に上方修正）の教官のうち19名が充足されており（ただし、うち７名は上位学位取得のため留学中)、予定された活動についてもおおむね順調に実施されている。1991年に最初の学生を入学させて以来の、これまでの活動の成果は顕著である。たとえば1997年１月に実施されたタイ工学会による土木工学分野の年次総会においては、本学科から６本の論文が発表されている。

こうした結果、1996年には、Sirinthorn International Institure of Technology(SIIT)との合同による大学院コースを開始し、12名の修士コースの学生を擁している。また、1997年には独自の大学院コースも開始し、18名の学生の指導を開始している。さらに土木工学科は、政府のGanjana Pisek Projectのもと、1999年に博士課程コースを認可申請することを検討中である。

プロジェクト開始以来、初年度は３本であった国内学会での論文発表の件数が、２年目、３年目において各々６本ずつとなっている（３年間の合計15本)。また初年度はゼロであった国際学会での論文発表件数が、２年目で３本、３年目で４本となっており、着実に増加している。しかしながら、いまのところ国際的なジャーナルに掲載された論文は１本のみであ

り、常時このようなジャーナルに掲載できる論文を作成できるレベルには至っていない。

日本人専門家との良好な協力関係が構築されており、その指導は、土木工学科の教官の教育能力、研究能力の向上に大きく寄与していると判断される。

3－2－5　化学工学科

基本的な活動はプロジェクト・デザイン・マトリックスで明示されている①教官の教育能力の向上　②教官の研究能力の向上及び　③管理システムの改善-----である。

①については日本側の3人の長期専門家及びタイ側教官との間で多くの議論を行い、タイ教官によるシラバスの作成、講義ノートの作成などが実施されている。特に、1997年6月5日現在においては3人の若手教官が在学するだけであり、教育への長期専門家の指導は不可欠であった。もちろん、過去3年間に訪タイした短期専門家の多大な貢献もある。実験室及び研究室の整備も長期専門家の指導で行われており、無償及びプロ技いずれの機材も有効に利用されている。これらの導入にあたってはプロジェクト初期に在籍していた指導的立場にいるタイ側教官が長期専門家と密接に連絡・相談しており、活用度が低いと思われる機材はドラムドライヤー他1、2点であった。ただし、当時の教官が現在留学中であり一部の機材の有効利用は彼（彼女）らの帰国を待たねばならない。なお、学生実験設備の1/3、さらに後術の卒業研究設備の1/2はJICA機材によっている。

②については1996年タイ学年歴において卒業研究を実施し、発表会も行った。いくつかのテーマは日本側長期専門家の共同指導によるものであり、タイ教官の研究への興味の喚起に有効であった。また、成果の一部はマレイシアで行われる（1997年10月）国際会議で発表する予定であり、これはタマサート大学工学部化学工学科の教官・学生による研究成果の最初の発表である。研究については、ソンクラー大学工学部・農工学部及びコンケン大学工学部との共同研究が予定されている。また、3人の長期専門家が所属している東京工業大学工学部から研究者交流を主とした国際学術研究（文部省科学研究費）が申請されており、研究の活性化が期待される。

③については学科の運営よりも実験・研究遂行のためのフロアの専門別区分け・整備及び実験・研究のための設備・器具・マニュアル作成などに焦点を置いているが、タイ側の若手教官には経験が乏しく、これらの活動への長期専門家の貢献が著しい。

3－2－6　機械工学科

機械工学科には1997年4月現在8名の教員が在籍しており、うち1名は国外留学中である。教員中博士号取得者はなく、修士号及び学士号取得者がそれぞれ5名、3名となっている。プロジェクト発足時に教員が1名しか得られなかったことに比べれば、状況は改善されてい

るが、今後さらに有能な教員の採用に努めることが、学科発展に対する最重要課題であると思われる。

機械工学科は学科の教員不足のため、1993年開設の予定が2年遅れ、1995年に開設された。従ってプロジェクトの進行は他学科に比べてやや遅れている。タマサート大学の学制では学生の学科配属が2年次からとなっているため、専門教育科目の講義が開始されたのは1996年6月からである。1997年6月現在の学生数は第2学年10名、第3学年19名であり、第4学年にはまだ進級者はいない。これまでのところ、長期専門家が派遣されたことはなく、生産工学科の長期専門家が機械工学科をも兼務してきた。プロジェクト開始以来3年間に3名の短期専門家が派遣されており、彼らによってセミナーが開かれ、カウンターパートに対して学生実験などについての有益な助言が与えられた。

本プロジェクトによって機械工学科に供与された設備は、そのほとんどが学生実験のための教育用機材であるが、いずれも管理状況は良好である。

機械工学における主要科目の講義は1997年6月に始まったばかりであり、卒業研究は来年度開始の予定になっている。従って現時点におけるプロジェクトの成果は大きなものではない。3回のセミナーが短期専門家によって開催された。講義科目"Fluid Mechanics I"に対する講義ノートが短期専門家の指導のもとにカウンターパートによって執筆された。また1編の研究論文がタマサート大学工学部のAnnual Research Reportに掲載された。

機械工学科の当面の課題は、来年度から始まる卒業研究の準備である。この作業は本年度中に終了させておかねばならず、JICA専門家の助力が必要だと思われる。専門家の人選にあたってはこの点への配慮が必要であろう。

3－3　プロジェクトの現状と課題

わが国でも、近年の産業構造の変化や先端科学技術の振興を踏まえた、工学人材の養成が重要課題となり、工学分野の高等教育機関の充実が進められているが、タイ国においても産業や情報の高度化が求められる中で大学、工業高専、民間ベースなど多様な形態の人材養成が展開されている。人文・社会科学分野におけるタイ国の中心的教育・研究機関であるタマサート大学に1989年に工学部が設置されたのも、同様の理由からであるが、1994年から開始された本件プロジェクトは、同工学部の育成強化、質の向上を目的としたものであり、プロジェクト方式技術協力事業の中でも、レベルとしては最も高水準に属するものである。

プロジェクトの計画の達成状況、現時点での評価、今後の実施にあたっての提言等は前述のとおりであるが、全体として計画はおおむね順調に実施されていると認識できる。

以下、プロジェクトの終了時点にこだわらず、今後の課題について記すものである。

（1）大学間の連携協力

高等教育・研究機関が優れた機能を有するためには、教官、学生、設備、環境などさまざまな重要な要素があるが、さらに当該国全体の水準の向上にあたっては、共同研究や大型設備の共同利用、セミナーや学会活動など、一つの大学・機関の枠を越えた取り組みが必要となる。

タイ国には、チュラロンコン大学、キングモンクット工科大学など工学分野で優れた大学があるとともに、タマサート大学工学部の置かれているランシット地区にはAITやSIITなど、設立形態は異なるものの、優れた教育・研究のための機関と人材が配置されている。残念ながら現時点においては、チュラロンコン大学やAIT、SIITは、新しいタマサート大学工学部の活動に特別の興味や関心を示していない。研究成果、実績が直接的に教官の給与等に影響する同国では、これら大学間の連携は容易ではないが、今後セミナー開催や国内の学会活動等を通じ、学外との積極的な交流が期待される。

（2）要員の確保

わが国でいう「教官定員」という考え方はないものの、プロジェクト開始以来、スタッフの数が逐次確保されつつあることは評価できる。ただし博士号を有するものは極めて少なく、現在留学中の教官の帰国や、更なる要員の確保が絶対的に必要である。

一般に高等教育機関においては、教育と研究が一体となって進められており、優れた研究能力を有する者の確保は、教育面においても多大な貢献が期待される。今後、タマサート大学工学部に併設された大学院と一体となって、質の高い教育研究機能を確保するため、速やかに、高いレベルのスタッフを確保すべきである。

なお、文部省国費留学生の特別枠により、本件カウンターパートがわが国に留学しており、今後の重要な要員になるものと期待される。

（3）予算の確保

タイの大学においては日本の「当たり校費」に相当するような各教官に配分可能な基盤的教育研究経費はない。したがって、必要な研究費の確保は、各スタッフの努力によるところが大きいが、現在までのところ技術協力のスキームの中で、多大学よりは恵まれた環境にあると思われる。いうまでもなく、当該大学の運営のために必要な予算の措置は、タイ側で行われるべきものであり、本件技術協力のスキームとは異なるが、本学が協力期間終了後も独力で十分な教育研究経費を確保できる見通しを大学自身で構築すべきである。なお、この状況は、チュラロンコン大学でも同様であり、民間の活力等の導入が望まれている。

（4）その他

教育協力、特に新たに設置された大学や学部への協力について、その効果が現れるまでには、相当の年月を要する。

最も容易に理解できる効果は学生の就職状況や、入学成績であるが、これらは必ずしも、当該大学の教育研究機能の向上によるものかどうか、定かではない部分もある。従って、このようなプロジェクトの評価は極めて困難であるが、前章までても述べられているとおり、当初計画に沿ったプロジェクトが推進されているところである。

今回の調査結果を踏まえ、さらに残された2年間の協力で、今まで以上の効果が得られるよう期待するものである。

4．評価項目による中間評価

4－1　プロジェクト目標の達成状況

本プロジェクトは、プロジェクト目標としてタマサート大学教官の教育能力の向上、研究能力の向上、学部運営の向上を掲げており、それぞれの分野において多くの進展がみられた。タイ側による給与アップ、リクルートの努力などにより状況は改善の方向にあるが、化学工学科、機械工学科に関しては、当初予定の教官数を確保できていない。プロジェクト終了までの残り2年間に具体的な成果を出していくことが期待される。

全体の教官数に関しては、当初44名であったのが現在66名まで増加しており、さらに増員が予定されている。教官の海外留学は継続中であるが、何人かは帰国しており、カウンターパートとしての役割が期待される。

他方、タイ側からは当初、英語でのコミュニケーションに支障のある専門家があったこと、短期専門家の派遣期間が2週間程度であり短すぎるとのコメントがあった。

現在、Annual Research Reportが取りまとめられており、これらは各教官の研究活動を支援する意味で重要な学部運営の手段となっている。

4－2　計画の妥当性

急激な発展に伴い、質の高い工学部卒業生を必要とするタイ産業界の実情や、1990年に最初の学生が工学部に入学したばかりのタマサート大学工学部が各学科の整備に奮闘していることを考えれば、プロジェクトの実施は時宜を得たものであったと言える。

今回の調査から、各学科の発展には凹凸のあることが分かったが、これはカウンターパート教官のリクルート問題と密接に関係している。しかし、これはいわば、当初から危惧されていたタイ側の問題であり、たとえば、本プロジェクト基礎調査団報告書＝平成5年3月；項目6－2（17頁）参照＝日本側としては直接的な解決のできない種類の問題である。しかし、今後の残存期間のプロジェクトの遂行にあたって、凹凸をなくす方向の積極的な努力をするのか、ほぼ各学科一律のサポートをするのかは、カウンターパート側の要求・要望とのすり合わせを含め、十二分の検討を要する問題であると認識している。一律なサポートは学科間の格差をさらに大きくする可能性が高い。

4－3　自立発展の見通し

3年間の活動の成果から判断して、タマサート大学工学部は将来タイの工学界の指導的存在になり得る。

組織面では、学部・学科ともにまだ弱いと判断せざるを得ない。その大きな理由は教官数

不足及び現在その多くが海外留学中（1997年3月末において全教官数66のうち26が海外）であることであり、彼（彼女）らが帰国して学科の教官数が充足されれば解決されるであろう。工学部は最近「TOP UP SYSTEM」と呼ばれる新しい給与体系を導入した。これによるとタマサート大学の教官給与は他の国立大学教官に比べて、学士、修士、博士保持者で各々70、100、130パーセント高くなり得る。この制度による給与改革及び最近のタイ経済事情の停滞から、従来民間企業に流れがちであった人材を確保できる可能性もある。また、政府の特別財源により外国人客員教官の招聘計画が進んでおり、化学工学科に着任が予定されている。これらの事情から、教官不足という致命的な事態も今後改善が期待される。

財政面での自立性はタイ政府の今後の対応にかかっている。工学教育・研究において最大の支出は、人件費を別にすれば設備の導入である。JICAによる供与機材は本プロジェクトではおおむね適切に導入されている。これらとタイ政府その他による供与機材とを組み合わせることにより、今後消耗品及び運転費などの予算措置が取られれば十分に質の高い研究が遂行できる。もちろん、研究能力を具備した教官が充当されることが必須である。

人的資源及び技術面では、学科による到達度が著しく異なっているという問題がある。タイ国側の需要の相異、供給可能な人材の確保の可能性など、分野による状況の相異があるのが発展途上国の宿命ではあるが、上述した種々の要因が追い風になることを期待する。また、人材不足に伴って供与機材の共同利用の申し込みにこたえられないという事態が生じている。これも教官の確保次第で事情が異なってくる。

5．提言

5－1　総括事項

十分な教官の確保は、最優先課題として取り組まれるべきである。また、日本側としては、短期専門家を効率的かつ効果的に派遣し、技術移転を実施していくことが必要である。

また、論文作成、学会出席・発表がプロジェクトの重要な活動の一つとなっていることもあり、日本側によるカウンターパート及び専門家の学会出席への支援を現行の枠組みよりさらに拡充していくことが必要であろう。具体的にいえば、現在、日本側による学会出席への支援はアセアン域内に限られているが、国際的に認知された学会の多くはその他の地域で開催されることを考えると、適用の枠を見直していくことが必要と考えられる。本プロジェクトの高等教育案件としての特性を考慮すると、この改善を行うことが極めて重要である。

1997年６月の時点で26名の教官が上位学位の取得を行っているところであり、そのうち24名がタイ国外に留学している。この24名のうち、日本に留学しているのは３名のみであり、うち２名が文部省留学である。残り21名は米国または英国に留学しており、タマサート大学からの資金による留学生は４名、大学省によるものが12名、科学技術環境省によるものが４名、王室奨学金によるものが１名となっている。JICAを通した本大学への支援の効果は大変大きいが、高等教育において非常に重要な、留学による上位学位を取得するという部分に関しては、日本の貢献があまり見られないことについて、日本側としても留意すべきである（プロジェクト関連教官の留学状況については、付属資料５．参照）。

5－2　電気工学科

プロジェクトの目的そのものはタイ側のカウンターパートにもよく認識されているようで、全体として望ましい方向に向かっているといえよう。問題は、カウンターパートの留学計画と機材納入時期のマッチングがとれていない例などが認められる（３－２－２参照）ことである。また、タイ側からはカウンターパート研修受け入れ数の増加の要求（３－２－２参照）などもある。これらを考えると、カウンターパート受け入れ数などにある種の自由度（たとえば、全体数は動かせないとしても研修年度の変更に対する自由度など）を持たせることができれば、この種の問題の解決に役立つことになるであろう。機材供与とカウンターパートの研修とはともに重要であるが、その両者の投入タイミングの連携、あるいはプロジェクト年次進行に伴うカウンターパートの状況変化に応じたそのウエイト付けの変更（予算的措置としては、たとえば技協機材供与を見合わせ、研修員の受け入れに変更するなど）などを現地長期専門家の目を通して吸い上げ、プロジェクトの効率的かつ有効な遂行に役立てることが望ましい。これは、電気工学科だけの問題ではなく４－１で触れた計画の妥当性

にも関連する。

5－3　生産工学科

生産工学科における教育及び研究環境は順調に整備されつつある。ただし、プロジェクト活動がやや品質管理と人間工学に偏っている傾向が見られる。生産技術など生産工学の他分野へも十分配慮し、学科全体がバランス良く発展することが望まれる。

研究活動は活性化しつつあるとはいえ、十分ではない。生産工学科は修士課程の本年度開設が決まっており、修士課程の教育内容をより充実したものにするためにも、研究活動を活発にするとともに、質を高める必要がある。研究活動の活性化の方策として、他大学や他研究機関との共同研究が有効であると思われる。

5－4　土木工学科

本学科は、教育能力、研究能力とも十分なレベルに向上しており、学科への入学者は高等学校のトップレベルで、博士号保有の8名の教官の能力は満足のいくレベルに達している。これら博士号保有者の数は近年中に16名に増加することが予定されている。このような状況から、本学科に関しては、プロジェクト終了時点において学科が自立的に運営されていくことは間違いないものと判断する。

また、大学院の拡充は学科そのものの拡充にもつながるため、今後力を注いでいくことが必要である。また、現在、埼玉大学との学生交流協定のような国際的な環境で研究活動を進めていくことも重要である。さらに、本学科はSIITとの連携も積極的に進めているところであるが、今後も継続して良好な連携関係を持っていくことが、本学科の拡充にもつながるものと判断する。

5－5　化学工学科

プロジェクトはこれまでのところ、機材供与及び専門家派遣両面で十分に成功している。唯一の問題はタイ側教官の不足である。現在8名が在籍しているが、博士号保持者は皆無であるため、その5名が博士号を取得すべく海外留学中である。特に初期のキーパーソンであった教官が帰国する2000年までが最も厳しい時期であろう。しかしながら、現在残っている若い教官が教育にも熱心で、研究にも興味・意欲を有していることが救いである。この期間における日本側専門家の役割は今までと同様あるいはそれ以上に重要であり、プロジェクトが自立発展の見通しを持てるまでの成果を挙げるために不可欠な要素である。1999年には研究用建物が建設される予定だが、その機能的運用及び研究テーマ設定などに専門家の助言が必要である。1997年6月に2名の外国人教官が客員として赴任する予定で、学科発展に寄

与することが望まれる。しかし、その登用は直前まで学科主任及び日本側長期専門家に知らされていなかったようで、役割分担などを明確にしないと実効が上がらない恐れがある。

教育・研究能力を備えた教官が充足されたら、大学院の設置が望まれる。

5－6　機械工学科

現在、教官組織も徐々に整備され、教育体制は整いつつある。また、新しく着任した教官を中心として研究活動も開始されている。これらの動きを促進し、機械工学科を着実に発展させるためには、更なる教員組織の充実が最重要課題である。また、来年度から始まる卒業研究を順調にスタートさせるためには、広い学問分野をカバーしうるような専門家の派遣が検討されるべきである。

1999年3月に第1回の卒業生を社会に送り出すまでは、当学科の教官は初めて担当する講義の準備に専念することになると思われる。学年進行中のこの2年間は教育体制の確立を第1の目標とすべきである。しかしながら、卒業研究をより内容のあるものにするためには、教官自身研究活動の体験を持っていることが望まれる。また、他学科に対する遅れを取り戻すためにも、できるだけ早い研究体制の整備を心掛けるべきである。

付　属　資　料

1．ミニッツ

2．日本側投入実績

3．プロジェクト活動の結果

4．プロジェクト活動の経緯

5．プロジェクト関連教官の留学状況

6．各科別現況報告資料

7．タマサート大学概要

8．タイ国の大学における工学部の現況

9．タイ国の大学教育（分野別卒業生数）

付属資料１．ミニッツ

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

The Japanese Advisory 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 June 2nd to June 10th, 1997. During its stay, the Team had a series of discussions and evaluated the 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 programs 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 discussion, the Japanese and Thai sides agreed upon the matters referred to in the documents attached hereto.

Bangkok, June 9, 1997

Dr. Fumio Nishino
Leader
Advisory Team
Japan International Cooperation Agency

Assistant Prof. Somnuke Praparntanatorn
On behalf of
Prof. Noranit Setabutr
Rector, Thammasat University

THE ATTACHED DOCUMENT

I. INTRODUCTION

Each member of the Team paid visits to the project sites, and had interviews and discussions with Thai counterparts and Thai government officers in charge, concerning the situation of the Project activities and management in respective fields and confirmed the progress and achievement of activities.

In order to evaluate the past performance and achievement, the Team used the following materials as the references:

(1) The R/D

(2) The Minutes of Meetings, the Annual Work Plans and other documents agreed upon or accepted in the course of implementation of the Project.

(3) PDM (Project Design Matrix) attached to the Minutes of Discussion signed on 3rd of July 1995.

(4) PDM which is revised by the joint efforts of Thai side and the Team (hereinafter referred to as "the revised PDM")

Using the above four, the Team evaluated the project in terms of "Project Achievement", "Efficiency", "Rationale" and "Sustainability".

II. BACKGROUND AND SUMMARY OF THE PROJECT

According to the R/D, the Project purpose is to produce graduates of higher standards from the Faculty of Engineering at Thammasat University. The fields of the Japanese technical cooperation of the Project are Electrical Engineering, Industrial Engineering, Civil Engineering, Chemical Engineering and Mechanical Engineering.

In the revised PDM which is given in ANNEX I, the Project purpose is rephrased as "To enhance the capability of the Faculty of Engineering at Thammasat University".

III. MID-TERM EVALUATION

1. PROJECT ACHIEVEMENT

(1) Inputs to the Project during the three years since the inception from Japanese fiscal year 1994 to 1996

1) Japanese side

(i) Dispatch of Japanese experts

Thirteen (13) long-term experts have been dispatched. They are the Chief Advisor,

Coordinators, experts on Civil Engineering, Chemical Engineering, Electrical Engineering, and Industrial Engineering with different working period, one to two year term. Total number of thirty two (32) short-term experts were dispatched.

(ii) Acceptance of the Thai counterpart personnel for training in Japan

Japanese government received ten (10) counterpart personnel.

(iii) Provision of machinery and equipment

Japanese government has provided such machinery, equipment and other material necessary for the smooth implementation of the Project, whose total value is approximately 149 million Japanese yen.

(iv) Sharing local cost

In addition to the general administrative cost for Japanese Expert's activities, about 28 million Japanese yen was contributed by Japanese government to cover local operating cost.

2) Thai side

(i) Budgetary allocation for the Faculty of Engineering

Thai side has allocated about 286 million Thai Baht from Thai fiscal year 1994 to 1997.

(ii) Allocation of Thai counterparts

Total number of 66 teaching staff have been assigned for conducting project activities.

(2) Project activities & outputs from the Project

1) General

One of the anxieties at the time of the preparation of the Project was the recruitment of the teaching staff, who were the counterparts of the Project. The assumption at the time at Japanese side was that recruitment of teaching staff could be made because of the reputation of Thammasat University in Thailand and the location of the Faculty of Engineering within metropolitan Bangkok area which is even closer to the center of Bangkok compared with the location of King Mongkut Institute of Technology - Ladkrabang which was sufficiently staffed. Thai side was also thinking in the same way. However, the rapid industrial development resulted in huge demand for engineers, which in turn resulted in the increase of salary scale in private sector. While the salary scale of the civil servants including the teaching staff of the

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Faculty of Engineering remained the same making the difference between the salary scale of the possible counterparts and engineers at private sector significantly large. In addition, the Dean of Faculty of Engineering, who made the original request of the Project to Thai government and who was very senior in Thai engineering society and hence influential for recruitment of the staff left the Faculty. It seems to be a difficult task to recruit teaching staff as anticipated for the newly elected Dean under the severe handicap of salary scale compared to the private sector. The situation is improving as commented at a later section of this attached document.

One of the attainments of the Project is the academic and student exchange agreement between the Faculty of Engineering of Thammasat University and Saitama University, and Tokyo Institute of Technology. These agreements are expected to keep continue for years come. It would contribute not only for the sustainable development of the Faculty of Engineering of Thammasat University but also for the promotion of mutual cooperation between the faculty and each of two universities and two countries. In addition to the development of post-graduate programs in the departments of Civil and Industrial Engineering as stated later, other departments are also planning offering post-graduate programs in the near future.

2) Electrical Engineering Department

i) Promotion of Project Activities

Special lectures were done more than 10 times to four students in preparation and guidance to their senior student projects. Special seminars were conducted in the fields of electrical circuit, information processing, power electronics and opto-electronics. Functional separation of laboratory for research work from that for laboratory for course students was done in order to promote research activities of the staff.

ii) Outputs from the project

One textbook was published as a part of activities of the Project by the Project fund. The author should be, however, totally responsible for the content of the text. One paper co-authored by Thai counterparts and a long-term expert was submitted to an international conference and accepted for presentation. One paper written by a Thai counterpart alone is accepted for another international conference. These achievements are regarded as reasonable and expected outputs at this stage of the Project.

3) Industrial Engineering Department

i) Promotion of the Project activities

Teaching capability improvement: Various seminars by long-term and short-term experts were conducted on production management, quality management, human engineering, etc.
Research capability improvement: The fourth batch of students graduated from the department in the last academic year, and the counterparts have been efficiently supervising the senior student projects. Participation of counterparts in academic meetings tends to increase gradually.
Administration system improvement: The maintenance and management of equipment provided to the Project were implemented well, and they have been utilized effectively.

ii) Outputs from the Project

Two text books, entitled " Quality Control" and "Material Science" were published by the counterparts. Ten (10) seminars were organized for counterparts and students. Two (2) research papers were published in Annual Research Report, Faculty of Engineering, Thammasat University.

The department is composed of 16 members at present. The number has been increasing favorably. Teaching environment appears to be regulated. Research activity is also becoming lively, but more activity outside the university is desirable at the next stage. As a result, the department is ready to start a graduate program in 1997.

4) Civil Engineering Department

Almost all of the planned activities were smoothly implemented. The total number of teaching staff is 19 out of the original total target number of 20 which was revised to 25, but those who are present at the campus as of 1 June 1997 are 12. Remaining 7 are studying for advanced degrees abroad. Nevertheless, activities and attainments of the department are extremely high if considered its short history of enrollment of the first batch of student in 1991. One of the typical examples is the total number of presentation of technical papers at the Annual Academic Meeting of Civil Engineering organized by the Engineering Institute of Thailand held in January 1997. Six papers were presented from the department which ranked number four among the universities participating in the meeting. There are 14 Civil Engineering Departments among the national universities, 9 departments among the private university and one Faculty of Civil Engineering at an international graduate institute in Thailand.

Another good example illustrating the academic development of the department is the establishment of a joint master's degree program between Sirinthorn International Institute of Technology and the Faculty of Engineering in 1996 followed by its own post-graduate program

for a master's degree in 1997. As a result, there are presently 12 master degree students in the former program and 18 students in the latter one. The Civil Engineering Department plans to offer the doctoral degree program in 1999 under the government "Ganjana Pisek" project.

During three years since the inception of the Project, 15 papers were presented at domestic meetings, three during the first year of the implementation of the Project which may be the basic capability, doubled into six during each of the subsequent two years. A total of seven papers were presented at the international conferences during the three year period. Again, no paper during the first year, while 3 and 4 papers during the subsequent years, respectively. The teaching staff are not in the level yet to publish their papers into internationally recognized journals on regular basis. There was only one paper published in such a journal during the past project period.

A good cooperation among the Japanese experts and their counterparts seem to be present. The leadership of Japanese experts is contributing to upgrading both teaching standards and research capability.

5) Chemical Engineering Department

(i) Promotion of Project activities

Principal activities are; 1) teaching capability improvement including curriculum improvement, course development, teaching method improvement, laboratory/workshop course improvement, and development of teaching materials & laboratory instructions, 2) research capability improvement including research method improvement and presentation of research outputs, and 3) administration system improvement including technician training, equipment maintenance and management, and zoning of the floor area of the department.

With respect to 1) and 2), plenty discussions have been held on chemical engineering education under the advices of both the long- and short- term experts. Senior student projects have been enthusiastically guided by Japanese experts in cooperation with Thai teaching staff, which is surely useful to improve their teaching as well as research capability. Some of the results of senior student projects have been and will be presented in international conferences. This was the first presentation of research works carried out in the Chemical Engineering Department in TU and by TU students. Joint researches with Prince of Songkla University and Khon Kaen University are now in progress.

With respect to 3), the activity has been focused on the training and maintenance of the provided equipment. The role of Japanese experts to improve laboratory/workshop courses is remarkable, which compensates sufficiently for the shortage of Thai staff.

(ii) Outputs from the Project

At the moment, the most serious problem is the shortage of teaching staff . There are only 8 without any doctoral degree holders and 5 of them are now studying abroad. In particular the leading teaching staff are now abroad and will join the department in 2000 at the earliest.

Nevertheless, young staff are very eager about education as well as research under the appropriate advice of Japanese experts. They have already prepared the syllabus and lecture notes, and even carried out research work as the senior student projects under the guidance of Japanese experts.

Equipments either by grant aid or technical cooperation are suitably provided to supplement available equipment except a few items such as a drum dryer. This is because provided equipment were selected essentially by Thai teaching staff under proper advice of Japanese experts. Joint researches with two domestic universities will serve to motivate the interest in researches.

6) Mechanical Engineering Department

(i) Promotion of Project activities

Mechanical Engineering Department started to admit students in 1995, two years later than the other departments. Therefore, the development of the Project is delayed. The engineering course started in June, 1996 one year after the enrollment of the first batch of students, 15 students were in the second grade. Long-term experts dispatched to Industrial Engineering Department have been also taking care of Mechanical Engineering Department until now. Three (3) short-term experts were dispatched. They offered seminars and gave advice to counterparts on the improvement of laboratory courses.

(ii) Outputs from the Project

Education of major subjects in the mechanical engineering course has just begun in 1997, and senior student projects will start in 1998. Therefore, outputs from the Project are relatively small at present. Three (3) seminars were organized, and a comprehensive lecture note on "Fluid Mechanics I" was written under the guidance of a short-term expert. One research paper was published in Annual Research Report, Faculty of Engineering, Thammasat University.

(3) Project Purpose

There are improvements in all three areas of the targets of the Project, namely teaching capability, research capability and administration. Unfortunately, two departments faced difficulty for recruiting anticipated number of teaching staff, where the Project purposes were not attaining the level as originally expected. The fewer the number of teaching staff, the busier they were. Situation is improving and

reasonable outputs are anticipated for the remaining two years of the Project.

Total number of the teaching staff of the Faculty of Engineering has been increased during the past year from 44 to 68. Additional increase is expected during the subsequent years.

The teaching staff studying abroad are continuing, but some of them have been returned. They form an important potential counterpart group.

It was pointed out from the counterpart group that a few initial Japanese experts were slightly poor in English proficiency. However, no such experts were dispatched in the subsequent years.

It was also pointed that a few short-term experts were dispatched for the duration of two weeks or so. They were able to give a series of seminars or a model lecture. The counterparts are demanding slightly more to utilize the potential of these experts. For this purpose, they are wishing that the short-term experts stay at least for a month. In addition, they prefer for short-term experts a higher English proficiency than long-term experts. The Team understood this demand as the indication of the eagerness and high expectation of the counterparts.

Annual reports containing original as well as reprints of research outputs are published each year since the inception of the Project. This publication is one of the ways that the administration can quietly encourage for the increased academic activities of the teaching staff.

2. EFFICIENCY

Efficiency of the Project is measured usually by the timing and appropriateness of inputs provided. Analysis was made to examine whether the timing, quantity and quality of provision of inputs were appropriate to realize expected outputs.

Generally, the efficiency of the Project in the past 3 years was satisfactory. However, it was observed that some inputs like equipment and experts were not provided at proper timing, which delayed the progress of the project activities. From this experience, planning and designing of delivery of machinery and recruitment of experts should carefully be undertaken in the future.

3. RATIONAL

Considering the fact that the Faculty of Engineering enrolled its first batch of students on 1990 and the fact that the Faculty was struggling to develop, the implementation of the Project was, in principle, timely. This was especially so to meet the high demand of Thai industrial sector for qualified graduates from engineering faculties due to rapid expansion of Thai industrial sector.

In spite of the hard work of both Thai and Japanese sides, the Project was unable to develop as anticipated at the beginning except Civil Engineering Department because of the shortage of the counterparts. Whether the Project target will be attained as planned depends on the implementation of the Project during the remaining years.

4. SUSTAINABILITY

It is quite possible that the Faculty of Engineering of Thammasat University develops into sustainable stage as one of the leading faculties in Thailand.

From the organizational aspect, the management of the Faculty and the departments looks still weak. It mainly comes from a shortage of teaching staff although the situation would be improved once the staff studying abroad come back and join the faculty. In addition, the Faculty has recently introduced a new system of salary scale, so called "TOP UP SYSTEM" sourcing from its own additional income. This system enables the salary of the teaching staff at Thammasat University to be 70, 100 and 130 percent higher than that of the other national universities for bachelor, master and doctoral degree holders, respectively. Consequently, an increase in salary together with the recent recession in Thailand attracts more qualified and increased number of staff to the Faculty. Furthermore, inviting foreign visiting professors to the Chemical Engineering Department under the special government scheme is also in progress. It is highly possible that these factors could be a favorable wind to resolve the situation.

From the financial aspect, the sustainability depends on the Thai government. Most of education as well as research budgets in the Faculty of Engineering are in general related to the equipment. JICA Project has provided suitable equipments at the present stage at least in some departments. By combination with other equipment from Thai government, teaching staff seem to be able to carry out rather high level education and research in Thailand if the running expenditure is sufficiently allocated by the Thai government. Of course, this will depend on the quality of teaching staff as well.

From the technical aspect, there are some problems to be resolved. The attained level of outputs is different by the department in particular in the qualification of teaching staff in terms of degrees and academic activities.

5. RECOMMENDATIONS

(1) General

The most important components for enhancement of the capability of the Faculty of Engineering is the human resources development provided there is sufficiently enough physical infrastructure and operating cost necessary for its purpose. "Grant Aid" of Japanese government and Thai government budget allocation have been able to establish minimum requirement of infrastructure necessary to carry out the objectives of the Faculty of Engineering. The provision of additional equipment through the Project was supplementing the existing equipment making the entire laboratory reasonably functional.

The shortage of the counterparts until now compared to the planned number was unable to anticipate at the time of preparation of the Project. Nevertheless, situation is improving. With the increased number of counterparts for the remaining period of the Project, efforts should be paid more for

upgrading their capability even by the expense of reduced provision of equipment. This could be possible by the dispatch of increased number of short-term experts.

For the efficiency and increased contribution by the short-term experts, it is essential and hence recommended that they stay at a minimum of four weeks and their English capability should be at least at the level sufficient enough for fluent communication.

Although the following matters are beyond the limits of JICA's regulation, the Team wishes to point out. One is the necessity of JICA's support thorough the Project for the participation of both the counterparts and Japanese experts in the international conferences to present the outputs of the Project. On one side, the Project is trying to enhance research capability, but on the other side when qualified outputs were attained, the Project can not support presentation of them at international conferences. This limitation of regulation in not consistent. Most of the conferences are held outside Thailand and ASEAN countries. For the Project on higher education especially on improving research capability, the provision of international travels is essential. The activity of a project for technical cooperation for higher education can not be limited within a country or a region. The second is the necessity of a scheme for the human resources development participating in formal post-graduate programs. Among the 68 teaching staff as of 1 June 1997, 26 are studying participating in post-graduate programs. JICA is sponsoring only two out of 26. In addition, those two are studying at Thai universities. Remaining 24 are studying abroad. Out of 24, only three are studying in Japan receiving Monbusho scholarships (2) and other scheme (1). 21 teaching staff are studying at universities in the U.S. and U.K. They are sponsored by the central administration of Thammasat University (4 staff), Thai Ministry of University Affairs (12 staff), Thai Ministry of Science, Technology and Environment (4 staff) and Royal Thai government (1 staff). JICA's contribution for the Project is much larger in terms of money for the effectiveness of the Project purposes, however, the efforts of Thai government sending the teaching staff abroad for advanced degrees might play even larger role. Japanese government is better to pay attention for human resources development through post-graduate study not only on individual basis, but also on the basis of institution building such as enhancing the academic standard of the Faculty of Engineering of Thammasat University.

It is also worthy to note that those who received scholarships studying abroad were selecting universities in the U.S. and U.K. The reason for this selection could be the means of teaching in English. Establishment and promotion of English programs at Japanese universities would be essential if Japan wished to contribute in human resources development in engineering and technology.

(2)Electrical Engineering Department

As a whole, the Project is moving to a desirable direction. At the present stage, the purpose of the Project is well understood by Thai counterparts. The only problem which has been found is some kinds of mismatch of the timing of installation of the provided equipment and the study plan of the

counterparts. Taking this kind of situation into account, some flexibility is desirable in the number of counterpart trainees in each year even if the total planned number is fixed.

(3) Industrial Engineering Department

Teaching and research capability has been enhanced favorably. However, the activity tends to be biased in the fields of quality management and human engineering. Well-balanced development, through the activities of the other fields in Industrial Engineering, is desirable. For further enhancement of research activity, joint research with other research institutions is recommended.

(4) Civil Engineering Department

The department has already developed both in teaching and research capability to be able to attract students among the top group from high school graduates to its undergraduate program and also from the undergraduates to master's degree program. Present teaching staff with eight staff having doctoral degrees are reasonably well qualified. Teaching staff with doctoral degrees are expected to increase to 16 in a few year period.

It is confident that the department will attain the stage to be able to develop by themselves when the Project terminates.

The Project is better to encourage for further development of master's program, for its teaching material development, and supervision of theses. Similarly, activities in the international environment is to be encouraged including the academic and student exchange agreement made between the Faculties of Engineering of Thammasat University, and Saitama University and Tokyo Institute of Technology.

The department is successful to cooperate with the staff of Sirinthorn International Institute of Technology of Thanimasat University, which has staff who are extremely qualified in teaching and research capability. Further development of the joint efforts by the staff of the department and those at SIIT would be able to make the department as the center of excellence.

(5) Chemical Engineering Department

The Project has been successful up to the present stage in terms of equipment provision as well as the dispatch of Japanese experts. The only problem is the shortage in the number of teaching staff which should be resolved as soon as possible. Nevertheless, young staff actually working seem to be very eager about education and to be interested in research activities. The advice and guidelines given by Japanese experts have been very useful and will be key factors in order that the Project will attain the reasonable level for sustainability through its outputs. Two visiting professors who are expected to join the department in June 1997 and to stay 11 months could be also helpful to resolve the problem. In 1999, the new building will be completed where research works will be carried out in separate laboratories depending on fields. The guidance from Japanese experts with respect to the department zoning as well as to the research topics will surely contribute to the department to attain the Project

purposes.

The establishment of a graduate program is recommended when the qualified teaching staff are recruited in order to enhance the research activity.

(6) Mechanical Engineering Department

The teaching staff may be busy now preparing for their teaching materials. Though the satisfaction of educational activity is the first objective at present, research activity should be started with the beginning of senior student projects in 1998, and activated as early as possible. An increase of the staff and dispatch of appropriate experts are important for the smooth development of Mechanical Engineering Department.

IV. IMPLEMENTATION SCHEDULE OF THE PROJECT

1. The "Annual Work Plan" in Japanese fiscal year 1997 is appended in ANNEX II.

2. Input from both sides

(1) Input from Japanese side in Japanese fiscal year 1997.

1) Dispatch of Japanese experts

(i) Long-term experts

Seven (7) long-team experts will be dispatched for technical cooperation on the Project, one expert in each of the following fields: Chief advisor, Coordinator, Electrical Engineering, Industrial Engineering, Civil Engineering, Chemical Engineering and Mechanical Engineering.

(ii) Short-term experts

Twelve (12) short-term experts will be dispatched for technical cooperation of the Project.

2) Training of the counterpart personnel in Japan

Five (5) counterpart personnel will be accepted for the training in Japan.

3) Provision of machinery and equipment

Machinery and equipment will be provided for the smooth implementation of the Project within the amount of 72 million yen.

(2) Input from Thai side in Thai fiscal year 1997

1) Allocation of budget

Thai side will allocate about 68 million Thai Baht for Thai fiscal year 1997.

2) Academic staff

Total number of 68 academic staff members will be assigned for conducting project activities.

V. OTHERS

1. Thai side requested that the term of the short-term experts be longer than two to three weeks for more increased and efficient cooperation. Japanese side replied that every effort would be made to dispatch short-term experts for a longer period although it would be at the longest one and a half month due to constraint of the system at universities in Japan.

2. Thai side requested further financial assistance to enhance research activities from Japanese side. The Team expressed that the Project budget can be utilized for those activities in consultation with the Japanese experts.

ANNEX I : Revised Project Design Matrix

ANNEX II : Annual Work Plan

PROJECT DESIGN MATRIX OF THE PROJECT TO ENHANCE THE CAPABILITY OF THE FACULTY OF ENGINEERING AT THAMMASAT UNIVERSITY ANNEX I Ver. 9.1997

Narrative Summary	Verifiable Indicators	Means of Verification	Important Assumption
Overall Goal To promote FOE of TU to become one of the leading faculties in the field of Engineering in Thailand.	1. Admission of highly qualified students. 2. Attractive faculty position equivalent to the other leading FOEs in Thailand.	1. Entrance examination score and its correlation to the other FOEs in Thailand. 2. Qualification of teaching staff in terms of degrees and academic activities. 3. Number of research contracts with the private enterprises and others. 4. Annual Report by FOE, TU. 5. Questionnaire and interview.	1. The Government gives high priority to industrial development. 2. The demand for engineers exceeds over their supply. 3. Job-hopping and brain draining commonly occur in society. 4. Thai wage gap between private and Government sectors is not narrowed rapidly for the time being. 5. Enough budget is allocated to manage FOE, TU.
Project Purpose To enhance capability of FOE of TU.	1. FOE, TU at least maintains its popularity from the applicants in entrance examination as is the case at present. 2. The teaching staff can get easily contract researches and consulting works. 3. The vacancy in the post of teaching staff becomes less. 4. The graduate programs are to be established.		1. Necessary number of teaching staff is obtained. 2. Teaching staff remain in educational and research activities after their studying abroad. 3. Teaching staff have enough time strength to develop their abilities. 4. Necessary number of supporting staff is obtained.
Outputs 1. Academic staff have the teaching capability to give qualified lecture, laboratory/workshop courses, guidance on senior student projects, etc. to the students and thereby graduates are to be of higher quality. 2. Academic staff have the research capability to promote the collaboration between FOE and relevant institutions domestically and internationally and contribute to the development of industries from educational and research aspects. 3. Administration system of FOE is to be improved.	1. Improvement of Teaching Capability (1) Preparation and modification of syllabus for its improvement (2) Model lectures (3) Participation in seminars (workshops) (4) Organizing seminars (workshops) (5) Improvement of laboratory/workshop courses (6) Assistance and guidance to senior student projects (7) Publication of textbooks, lecture notes, instruction manuals, etc, 2. Improvement of Research Capability (1) Participation in academic meetings held inside and outside Thailand (2) Presentation of research papers in academic meetings and/or journals domestically and internationally (3) Exchange of information and technology with the relevant institutions (connected with 1.(3) and 1.(4) above) (4) Further studying within and outside Thailand for strengthening research capability (only with JICA's support) 3. Improvement of Management (1) Publication of "Annual Research Report" (2) Operation and management of equipment and machinery (3) Educational and research grouping (4) Planning and establishing of "Post-Graduate Programs" (5) Seminars on academic system (6) Publication of "Annual Report" and "Newsletter" (7) Staff development and staffing plan (8) Academic exchange with foreign universities		
Activities The fields of the Project are; Electrical, Industrial, Civil, Chemical and Mechanical Engineering 1. Teaching capability improvement a. Curriculum improvement b. Course development Experts to give model lectures in collaboration with Thai lecturers to improve teaching capability of academics staff c. Improvement of teaching methods c.1 Improvement of teaching material such as slides and videos c.2 Improvement of teaching methods through field trips and workshops d. Improvement of laboratory/workshop courses d.1 Preparation of laboratory instruction manuals d.2 Experts to supervise for setting up laboratories e. Assistance in supervision of senior student projects f. Development of teaching materials and laboratory instructions 2. Research capability improvement a. Improvement of research methods b. Assistance for presentations of the results in academic meetings and/or journals 3. Administration system improvement a. Training technicians to be able to operate equipment. b. Maintenance and management of equipment and machinery c. Education and research grouping in each department if appropriate d. Improvement of decision making process of committees of academics staff	Input Japanese Side - Chief Advisor - Coordinator - Long term experts for 5 departments - short term experts for 5 departments and administration section - Acceptance of counterpart personnel in Japan - Equipment and machinery for 5 departments ABBREVIATION TU : Thammasat University FOE : Faculty of Engineering MUA : Ministry of University Affairs	Thai Side - Necessary land, building and facilities for the Project - Necessary running expenses for implementation of the Project - Necessary personnel for implementation of the Project	- The employment condition for lecturers does not become worse. Precondition - The number of students enrolled in Engineering programs of Thai universities does not decrease. - Budget allocation of Thai government to the engineering programs of Thai Universities does not decrease.

J.N.S.A

Annual Work Plan for the Project in 1997 / 98 Project : Faculty of Engineering Thammasat University

Electrical Engineering Activities	Target	Schedule 4	5	6	7	8	9	10	11	12	1	2	3	Responsible Person in Project Team	Input	Remarks
1. Teaching Capability Improvement																
a. Curricular Improvement	a-1. Curricular Survey and Study	←	—	→									←	Long Term Expert		
	a-2. Preparation for Syllabus		←	→				←	→							
b. Improvement of Teaching Methods	b-1. Observation and Supervision of Typical Classes			←	—	—	—	→	←	—	—	—	→	Long and Short Term expert		
	b-2. Special Lectures			←	—	—	—	→	←	—	—	—	→			
c. Improvement of Laboratory Courses	c-1. Observation and Supervision of Typical Laboratories			←	—	—	—	→	←	—	—	—	→	Long and Short Term expert		
	c-2. Revision of Laboratory Topics		←	→				←	→							
d. Development of Teaching Materials and Laboratory Instructions	d-1. Publication of Textbooks	←	—	→									←	Long Term Expert	Budget for Publication	
	d-2. Publication of Lecture Notes	←	—	→									→			
	d-3. Publication of Laboratory Instruction Manuals	←	—	→									←			
2. Research Capability Improvement																
a. Improvement Research Topics	a-1. Survey and Discussion on Research Topics	←	—	—	—	—	—	—	—	—	—	—	→	Long and Short Term expert		
	a-2. Revision of Research Topics	←	—	—	—	—	—	—	—	—	—	—	→			
b. Improvement of Research Environment and Methods	b-1. Grouping of Department Staff	←	→											Long and Short Term expert		
	b-2. Setup of Laboratory					←	—	—	—	—	—	→			Budget for Technical Cooperation and Grant Aid Equipment and Consuming Articles	
	b-3. Observation and Supervision of Specific Research Studies			←	—	—	—	—	—	—	—	—	→			
	b-4. Supervision of Senior Projects			←	—	—	—	—	—	—	—	—	→			
	b-5. Special Lectures on Specific Fields		←	→				←	→							
	b-6. Counterpart Training in Japan												←		Budget for Counterpart Training	
	b-7. Technical Seminars		←	→					←	→					Budget for Seminar	
c. Presentation of Results of Research Activities	c-1. Presentation of Technical Papers				←	→			←	→				Long Term Expert	Budget for Conference	
	c-2. Publication of Annual Research Report	←	—	→											Budget for Publication	
3. Administration System Improvement																
a. Self Study	a-1. Self Study Committee			←	—	—	—	—	—	—	—	—	→	Long Term Expert		
b. Meetings of Department	b-1. Regular Meetings of Department			←	—	—	—	→	←	—	—	—	→	Long Term Expert		
	b-2. Occasional Discussion between Department Staff and JICA Experts	←	—	—	—	—	—	—	—	—	—	—	→			

Annual Work Plan for the Project in 1997 / 98 — Project : Faculty of Engineering Thammasat University

Industrial Engineering Activities	Target	Schedule 4	5	6	7	8	9	10	11	12	1	2	3	Responsible Person in Project Team	Input	Remarks
1. Teaching Capability Improvement																
a. Curriculum Improvement	a-1. Introduction of research	→		→										Prof. K. Takada	Short-term expert (STE)	
	a-2. Curricula improvement based on group				→								→	All lecturers	Counterpart (C/P)	
b. Course Development	b-1. Reform of syllabus	→				→								All lecturers		
	b-2. New syllabus for new curricula						→						→	All lecturers		
c. Improvement of Teaching Method	c-1. Introduction of P/C for teaching			→				→						All lecturers	P/C hardware & software	
	c-2. Application video program			→								→		All lecturers	Video tape	
d. Improvement of Lab/Workshop Course	d-1. Preparation of syllabus for workshop courses						→						→	All lecturers Prof. K. Takada	STE	
	d-2. Improvement of method, report and workshop course			→									→	All lecturers	C/P	
e. Development of Teaching Materials and Lab. Instructions	e-1. Publication of textbook								→				→		C/P	
	Advanced Quality Control Lab. Direction for Metallurgy			→				→						Tritos Montalee		
2. Research Capability Improvement																
a. Improvement of Research Methods	a-1. Technical seminar						→						→	Prof. K. Takada	STE	
	a-2. Review of seminar				→		→							Prof. K. Takada	STE C/P	
	a-3. Joint work with the firms	→		→		→							→	Tritos and Montalee		
	a-4. Research with donated equipment	→		→				→					→	Sawat, Somsak and Apiwat Prof. K. Takada		
	CNC															
	CAD/CAM															
	Measurement Lab.															
b. Presentation of Results	b-1. Submission of technical papers							→					→	Montalee	C/P	
	b-2. Publication of annual research report	→		→												
3. Administration System	Advice	→		→			→		→		→		→	Prof. K. Takada	C/P	

Annual Work Plan for the Project in JFY 1997

Civil Eng. Dept. Activities	Target	Schedule 4	5	6	7	8	9	10	11	12	1	2	3	Responsible Person	Input	Remarks
1. Teaching Capability Improvement																
a. Course Development	a-1 Production of Syllabus	—	—	—	—	—	—	—	—	—				Dr. Chavalit & Long term expert		
b. Development Teaching Material and Laboratory Instruction	b-1 Publication of Textbooks (5 subjects)	—	—	—	—	—	—	—	—	—				Dr. Burachat (2) Dr. Kridayuth Dr. Krittiya Dr. Uruya	Budget	
2. Research Capability Improvement																
a. Improvement of Research Methods	a-1 Execution of Research Works (8 subjects)	—	—	—	—	—	—	—	—	—	—	—	—	All C/P & Long term expert	Budget Short-term Experts (2)	
	a-2 Seminar and Special Lecture														Budget	
	1) Joint Seminar with Hiroshima University												—	Dr. Burachat		
	2) International Seminar on Civil Engineering												—	Long term expert		
	3) Seminar by Short-Term Expert (2)				—						—			Long term expert & Short term experts	Short term Experts (2)	
	a-3 Collaboration Research with SIIT, AIT, etc.	—	—	—	—	—	—	—	—	—	—	—	—	Dr. Uruya		
		—	—	—	—	—	—	—	—	—	—	—	—	Dr. Burachat		
				—	—	—	—	—	—	—	—	—	—	Dr. Krittiya		
	a-4 Dispatch of C/P to Japan (2 C/P)			—	—	—	—							Mr. Chaisak		
													—	Mr. Sayan		till May, 1998
b. Presentation of Results	b-1 Presentation at International Conference (8 conferences)		—		—	—			—		—	—		Dr. Burachat, Dr. Uruya Dr. Krittiya, Dr. Virote Dr. Nakhorn	Budget	
						—										
	b-2 Presentation at National Conference								—					SC/P & Long term expert	Budget	

Annual Work Plan for the Project in JFY 1997

Civil Eng. Dept. Activities	Target	Schedule 4	5	6	7	8	9	10	11	12	1	2	3	Responsible Person	Input	Remarks
	b-3 Publication of Annual Research Report													Dr.Burachat, Dr.Nakhorn & Long term expert		
3.Administration System Improvement																
a.Demarcation of Departments														Dr.Virote & Long term expert		Any time
b.Research Grouping														Dr.Virote & Long term expert		Any time
c.Self-Study and Accreditation														Dr.Chavalit & Long term expert		
d.Meeting of Every Kind	d-1 Regular Department Meeting													Dr.Virote & Long term expert		
	d-2 Regular Department Meeting with JICA Expert													Long term expert & Dr.Krittiya		
	d-3 Meeting on Post Graduate Program with SIIT													Dr.Uruya & Long term expert		

Annual Work Plan for the Project in 1997/98 Project: Faculty of Engineering Thammasat University

Chemical Engineering Activities	Detailed Activities	Schedule 4	5	6	7	8	9	10	11	12	1	2	3	Responsible Person in Project Team	Input	Remarks
1. Teaching Capability Improvement																
a. Curricular Improvement	a-1 Periodical and Occasional Discussions on ChE Education	→											→	Prof.H.Sekiguchi & Short-term Expert		
	a-2 Curriculum Study	→											→	Ms.W.Skolpap		
	a-3 Preparation of Syllabus (Revised)	→		→										Ms.W.Skolpap		
b. Course Development	b-1 Occasional observation & Supervision for Each Course	→											→	Prof.H.Sekiguchi & Short-term Expert		
	b-2 Introduction of Educational Method using Personal Computer	→											→	Ms.W.Skolpap		
c. Improvement of Teaching Method	c-1 Feasibility Study/Planning Computer Aided ChE Education	→		→				→						Ms.W.Skolpap		
	c-2 Supervision/General Advice in Senior research Project	→											→	Prof.H.Sekiguchi & Short-term Expert		
d. Improvement of Lab/Workshop Courses	d-1 Improvement of Lab. Equipments	→		→				→		→				Ms.W.Skolpap		
e. Development of Teaching Materials and Lab. Instruction	e-1 Publication of Textbooks Chemical Laboratory I, II, III, etc	→					→							Ms.W.Skolpap		
2. Research Capability Improvement																
a. Improvement of research method	a-1 Supervision/Advice in Senior Research Project	→											→	Prof.H.Sekiguchi, C/Ps & Short-term Expert	Supplemental Equipments	
	a-2 Research Guidance/Supervision and Discussions	→											→	Ms.W.Skolpap Mr.P.Sirritheerasas		
	a-3 Exchange of Academic information (seminar, etc.)	→											→	Prof.H.Sekiguchi		with PSU, KKU CU, TIT
	a-4 Cooperation Research	→											→	Prof.H.Sekiguchi, C/Ps		with PSU,KKU CU, TIT
	a-5 Counterpart Training	→											→	Ms.W.Skolpap (Under Selection)	JFY'96 Budget	to TIT to TIT (not fixed)
b. Presentation of results	b-1 Presentation in the Symposiums · Regional Symposium on ChE (to be held in Malaysia)	→						→						Prof.H.Sekiguchi Ms.W.Skolpap Mr.P.Sirritheerasas	Registration fee (3 person)	5 papers
	· Domestic Conference of ChE	→						→						Mr.W.Promsakanasakol-nakorn		1 paper
3.Administration System Improvement of the Faculty																
a. Training Technician to be Able to Operate Equipment		→											→	Ms.W.Skolpap		
b. Maintenance and management of Equipment and Machinery		→											→	Ms.W.Skolpap		
c. Zoning of the of Department		→		→										Ms.W.Skolpap		

Annual Work Plan for the Project in 1997 / 98 Project : Faculty of Engineering Thammasat University

Mechanical Engineering Activities	Target	Schedule 4	5	6	7	8	9	10	11	12	1	2	3	Responsible Person in Project Team	Input	Remarks
1. Teaching Capability Improvement	a-1 Curricular Survey and Study	→			→	→					→	→		All Lecturers		
a. Curriculum Improvement	a-2 Preparation for Syllabus		→	→			→	→						All Lecturers		
b. Course Development	b-1 Preparation of Laboratory Course		→	→			→	→								
	b-2 Development of Laboratory Themes		→			→				→	→	→	→	Long Term Expert(LTE) All Lecturers	Budget for Grant Aid Equipment Budget for Technical Cooperation Equipment	
	b-3 Preparation of Laboratory Instructions		→	→			→	→								
c. Development of Teaching Method	c-1 Survey and Study on Course Teaching	→		→							→	→		All Lecturers		
	c-2 Special Lecture				→	→	→							LTE	Short Term Expert(STE)	
	c-3 Preparation of Textbooks	→	→	→	→	→	→	→	→	→	→	→	→	Some Lecturers		
2. Research Capability Improvement	a-1 Survey and Discussion on	→	→	→	→	→	→	→	→	→	→	→	→	LTE, All Lecturers		
a. Improvement of Research Topics	Research Topics															
	a-2 Development of Research Topics					→	→	→						All Lecturers		
	a-3 Technical Seminar				→	→	→							LTE, Chatchai, Pinai	STE, Budget for Seminar	
b. Improvement of Research Method	b-1 Special Lecture by JICA Short Term Expert				→	→	→							LTE, Chatchai, Pinai	STE Budget for Technical Cooperation Equipment	
3. Administration Systems	Advice					→	→	→	→	→	→	→	→	LTE		

1. Inputs

(1)Japanese side

As of March 31,1997

a-1. Dispatch of Long-term Experts

Position \ Japanese Fiscal Year	1994	1995	1996	1997	1998
Chief Advisor	Minori Sano 23/6/94 ——— 23/6/97				
Coordinator	Keiji Higa 1/6/94 ——— 31/10/96		Yuko Kishino 10/10/96 ——— 31/3/99		
Electrical Engineering	Michiaki Ito 1/7/94 ——— 31/8/95		Toshihiko Noguchi 24/5/96 ——— 31/3/98		
Industrial Engineering	Yutaka Yoshitani 15/6/94 ——— 15/8/95	Hiroshi Ito 22/7/95 ——— 21/7/96			
Civil Engineering	Hiroshi Mutsuyoshi 4/7/94 ——— 26/8/95	Hiroyuki Watanabe 1/9/95 ——— 25/9/96	Katsutoshi Tanimoto 16/9/96 ——— 25/9/97		

Remarks:1) Duration of dispatch of JICA expert: in order of Date/Month/Year

2)Japanese Fiscal Year: starting from April 1 and ending in March 31, the following year

1. Inputs

(1)Japanese side

As of March 31,1997

Position \ Japanese Fiscal Year	1994	1995	1996	1997	1998
Chemical Engineering	Hiroo Niiyama 15/6/94—15/10/95 Junjiro Kawasaki 15/10/95—16/10/96 Hidetoshi Sekiguchi 10/1/96—10/31/97				
Mechanical Engineering	None				

Remarks:1) Duration of dispatch of JICA expert: in order of Date/Month/Year

2)Japanese Fiscal Year: starting from April 1 and ending in March 31, the following year

1. Inputs

(1)Japanese side

As of March 31,1997

a-2. Dispatch of Short-term Experts

Japanese Fiscal Year / Department	1994	1995	1996
Electrical Engineering	Noriyoshi Kanbayashi 28/10-11/11 Toshinori Yoshikawa 28/10-11/11	Yukio Ichinose 11/9-20/12 Haruo Ogiwara 6/12-19/12 Kiyoshi Oishi 31/3-12/4	Isao Takahashi 16/11-29/11
Industrial Engineering	Yasuzo Uchida 28/1-2/2 Masaru Hattori 12/3-26/3 Shigeo Yanabe 7/3-21/3	Tokihiro Sasahara 26/2-17/3 Ario Osato 24/3-13/4	Mutsuo Takizawa 1/7-21/7 Mitsuhiko Hasegawa 15/7-14/11 Kazuo Nakamura 7/11-28/2 Ario Osato 24/2-23/6
Civil Engineering	Kazuyoshi Iwashita 6/12-18/12 Hiroyuki Watanabe 4/3-18/3	Yutaka Osawa 15/3-1/4 Katsutoshi Tanimoto 27/3-9/4	Hiroshi Mutsuyoshi 31/7-18/8 Yutaka Osawa 10/11-23/11
Chemical Engineering	Junjiro Kawasaki 11/12-24/12 Hiroyuki Kage 15/3-9/4	Atsushi Kanzawa 20/7-4/8 Hidetoshi Sekiguchi 25/7-16/8	Toshio Kajiuchi 30/7-15/8 Hiroo Niiyama 2/3-18/3
Mechanical Engineering	Kuniaki Okumi 6/2-18/2	Takehiro Ito 23/10-19/11	Toru Fukano 7/10-3/11
Installation of Equipment	None	None	Fumiya Hirakawa 16/12-20/12 Shuichi Tsukahara 24/2-1/3

Remarks: 1) Duration of dispatch of JICA expert: in order of Date/Month/Year

2)Japanese Fiscal Year: starting from April 1 and ending in March 31, the following year

1. Inputs

(1)Japanese side

b. Counterpart training

As of March 31, 1997

Japanese Fiscal Year	1994	1995	1996
Name (Department・Tenn)	Parichat Chuenwatanakul (IE・Mar.28-May 31) Watanachai Smittakorn (CE・Mar.29-Apr.26) Pongtorn Dhupatemiya (ChE・Nov.28-Feb.25)	Somsak Chueakittisak (IE・Mar.18-May 26) Saharat Buddhawanna (CE・Nov.5-Dec.25) Dhanit Phiphatpan (ChE・July 25-Sep.30)	Somchart Chokchaitam (EE・Mar.10-May 31) Montalee Sasananan (IE・Feb.20-Mar.22) Krittiya Lertpocasombut (CE・June 4-Sep.29) Wanwisa Skolpap (ChE・Mar.20-May 21)

（２）機材の利用・管理状況表

（160万円以上の機材）

供与年度	番　　号	機材名（メーカー名・型式）	利用(保管)場所	利用状況	管理状況	備考（特記事項）
1994	CE94T-001	データーロガー TDS-601	104号室	B	A	
	CE94T-002	スイッチングボックス ASW-50C-05	104	B	A	
	CE94T-004	コンクリートミキサー	105	A	A	
	ChE94T-008	遠心沈降式粒度分布測定装置 SA-CP3	325	B	A	
	IE94T-001	周波数解析装置 CF-5210	323	B	A	
	EE94T-001	ベクトルシグナルジェネレーター 8782B	609	B	A	
	ME94T-001	車両　トヨタRZH112R-RBMRS	工学部駐車場	A	A	
1995	IE95T-016	Work Station SUN ULTRASPA	605	A	A	
	CE95T-016	Work Station SUN ULTRASPA	602	A	A	
	CE95T-025	Scanner CALCOMP SCANPLUS Ⅲ	602	A	A	
	ChE95T-006	ガスクロマトグラフィ GC14	601	A	A	
	ChE95T-007	蛍光X線分析装置	601	A	A	
	ChE95T-008	重金属排液処理装置 LIX-F	601	A	A	
	IE95T-027	呼吸代謝計測装置K2	605	A	A	

付属資料3．プロジェクト活動の結果

For Discussions

Results of the Activities of the Project

to enhance the Capability of the Faculty of Engineering
at Thammasat University
during April 1, 1994 - March 31, 1997

April 30,1997

Results of the Activities of the Project

during April 1,1994 - March 31,1997

1. The Improvement of Teaching Capability

(1) Curriculum improvement

Curricula will be revised every four years. Therefore, curricula presently adopted in FOE will be utilized until 1998 Thai academic year.

(2) Preparation and modification of syllabus

Syllabus is to be prepared before the start of 1997 Thai academic year.

(3) Model lectures

For example, Dr. Junjiro KAWASAKI, as an short-term expert, gave a model lecture to the students in December, 1994 on "Decolorization of Waste Water from sugar Industries by Activated Carbon from Sugar Cane Bagasse" in cooperation with his counterparts who acted as interpreters and tried to brief them as easily as possible.

(4) Participation in seminar

Dept.	1994 JFY	1995 JFY	1996 JFY	TOTAL
EE	0	0	1	1
IE	0	0	3	3
CE	1	0	0	1
ChE	0	0	1	1
ME	0	0	0	0
TOTAL	1	0	5	6

EE : Electrical Eng., IE : Industrial Eng.

CE : Civil Eng., ChE : Chemical Eng., ME : Mechanical Eng.

(5) Organizing of seminar

Dept.	1994 JFY	1995 JFY	1996 JFY	TOTAL
EE	A-2	0	A-1, B-1	A-3.B-1
IE	A-2	A-4	A-2, B-2	A-8, B-2
CE	A-7	A-2	A-1	A-10
ChE	A-6	A-7	A-3	A-16
ME	A-1	A-1	A-1	A-3
TOTAL	A-18	A-14	A-8, B-3	A-40, B-3

EE : Electrical Eng., IE : Industrial Eng.

CE : Civil Eng., ChE : Chemical Eng., ME : Mechanical Eng.

Note : a. The seminar mentioned above is arbitrarily divided into two types according as its scale, that is, one is usually a special lecture given by one speaker and another is a so-called seminar held for one day or more with more than one speaker. The former is indicated as A and the latter as B.

b. JICA Seminar on "Various Aspects of Automobile Technology" held on August 22,1995 was jointly organized in cooperation with all departments concerned. Therefore, total number of seminars described above will amount to A-40 and B-4.

(6) Improvement of laboratory/workshop course

Short-term and long-term experts occasionally give the appropriate advises to counterparts on the improvement of laboratory/workshop course. However, there are some concrete examples on the matter as shown bellow :

a. In case of Department of Chemical Engineering,

- Dr. H. Sekiguchi : (a) Improvement of Chemical Engineering laboratory during July 25-August 16, 1995 and October 23-24,1995

(b) Establishment of laboratory for instrumental analysis from his assignment to this Project onwards.

b. In case of Department of Civil Engineering,

- Dr. W. Tanzo (Saitama University) : Improvement of computer system on August 30, 1994
- Mr. T. Aravintan (Saitama University) : Method of experimental data analysis by data logger and personal computer on November 18, 1996

c. In case of Department of Electrical Engineering,

- Dr. T. Noguchi : Functional separation of laboratory "for research work" from that "for laboratory courses for student" from his assignment to this project onwards.

(7) Assistance and guidance to senior student project

Please refer to the list of senior student projects of each Department.

a. In case of Department of Chemical Engineering,

Dr. H. Sekiguchi has been attending assistance and guidance to the senior student projects for 4 students since the beginning of this academic year, 1996, the themes of which are as follows:

1. Adsorption heat pump using activated carbon produced from food waste
2. Reaction of volatile organic compound in ac packed-bed reactor

b. In case of Department of Electrical Engineering,

Dr. T. Noguchi intensively gave the lectures 10 times (20 hours) during March 17-31,1997 to the four students in preparation for his assistance and guidance to the senior student projects beginning from next academic year, 1997.

(8) Publication of textbook, lecture note, instruction manual, etc.

Dept.	1994 JFY	1995 JFY	1996 JFY	TOTAL
EE	0	1	0	1
IE	0	1	1	2
CE	0	2	5	7
ChE	0	1	0	1
ME	0	0	1	1
TOTAL	0	3	7	12

EE : Electrical Eng., IE : Industrial Eng.

CE : Civil Eng., ChE : Chemical Eng., ME : Mechanical Eng.

2. The Improvement of Research Capability

(1) Participation in academic meeting

a. Domestic Meeting

Dept.	1994 JFY	1995 JFY	1996 JFY	TOTAL
EE	0	0	1	1
IE	0	1	2	3
CE	1	2	1	4
ChE	1	1	0	2
ME	0	0	0	0
TOTAL	2	4	4	10

EE : Electrical Eng., IE : Industrial Eng.

CE : Civil Eng., ChE : Chemical Eng., ME : Mechanical Eng.

b. International Meeting

Dept.	1994 JFY	1995 JFY	1996 JFY	TOTAL
EE	0	0	0	0
IE	0	0	1	1
CE	1	2	1	4
ChE	1	2	1	4
ME	0	0	0	0
TOTAL	2	4	3	9

EE : Electrical Eng., IE : Industrial Eng.

CE : Civil Eng., ChE : Chemical Eng., ME : Mechanical Eng.

Note : (1) In case of Department of Electrical Engineering, counterparts are scheduled to participate in two international meetings to be held in Japan in 1997 JFY for the presentation of their research papers.

(2) Also, counterparts of Department of Civil Engineering will take part in two international academic meetings and present their research papers in 1997 JFY.

(2) Presentation of research papers in academic meeting

a. Domestic Meeting

Dept.	1994 JFY	1995 JFY	1996 JFY	TOTAL
EE	0	0	0	0
IE	0	2	0	2
CE	3	6	6	15
ChE	1	0	0	1
ME	0	0	0	0
TOTAL	4	8	6	18

EE : Electrical Eng., IE : Industrial Eng.

CE : Civil Eng., ChE : Chemical Eng., ME : Mechanical Eng.

b. International Meeting

Dept.	1994 JFY	1995 JFY	1996 JFY	TOTAL
EE	0	0	0	0
IE	0	0	0	0
CE	0	3	4	7
ChE	2	0	4	6
ME	0	0	0	0
TOTAL	2	3	8	13

EE : Electrical Eng., IE : Industrial Eng.

CE : Civil Eng., ChE : Chemical Eng., ME : Mechanical Eng.

Note : (1) Counterparts of Department of Civil Engineering will present 3 research papers in 1997 JFY.

(2) Also, counterparts of Department of Electrical Engineering will present 2 research papers in 1997 JFY.

(3) Presentation of research papers in journal

a. Annual Research Report, FOE,TU

Dept.	1994 JFY	1995 JFY	1996 JFY	TOTAL
EE	1	1	11	13
IE	1	1	2	4
CE	14	23	16	53
ChE	3	0	3	6
ME	1	0	0	1
TOTAL	20	25	32	77

EE : Electrical Eng., IE : Industrial Eng.

CE : Civil Eng., ChE : Chemical Eng., ME : Mechanical Eng.

b. International Journal

Dept.	1994 JFY	1995 JFY	1996 JFY	TOTAL
EE	0	0	0	0
IE	0	0	0	0
CE	0	1	0	1*
ChE	0	0	0	0
ME	0	0	0	0
TOTAL	0	1	0	1

EE : Electrical Eng., IE : Industrial Eng.

CE : Civil Eng., ChE : Chemical Eng., ME : Mechanical Eng.

Note : * Dr. Uruya Weesakul : The Applicability of Real Time Flood Forecasting Model : A Case Study in Thailand, Journal of Hydraulics by Hydraulic Committee of Japan Society of Civil Engineers, 1995

(4) Exchange of information and technology with relevant institutions

Dept.	1994 JFY	1995 JFY	1996 JFY	TOTAL
EE	1[1)]	0	0	1
IE	0	0	0	0
CE	1[1)]	2[2)]	2[2)]	5
ChE	0	1[4)]	3[5)]	4
ME	0	0	0	0
TOTAL	2	3	5	10

EE : Electrical Eng., IE : Industrial Eng.

CE : Civil Eng., ChE : Chemical Eng., ME : Mechanical Eng.

Remarks : [1)] Visit to National University of Singapore,1994

[2)] Joint seminar with ERTC and first joint seminar with Hiroshima

University

3) Joint seminar with Hiroshima University and visit to Chiang Mai University

4) Joint seminar with ERTC

5) Visit to Prince of Songkla University (2 times) and Khon Kaen University

In addition, two counterparts attended "Regional Seminar & Workshop on Higher Engineering Education Network" held in Indonesia in 1997. Accordingly, the above total will be counted as 11.

(5) Further studying for strengthening research capability (only with JICA's support)

a. 2 Counterparts studying in Japan under the Monbusho scholarship

b. 2 counterparts studying in Chulalongkorn University under the scheme of JICA Project.

3. The Improvement of Management

(1) Publication of Annual Research Report

Vol.1 : published in July, 1995

Vol.2 : published in August, 1996

Vol.3 : to be published in July,1997

(2) Operation and management of equipment and machinery

The appropriate advices are given to counterparts on the above matter whenever necessity arises.

(3) Education and research grouping

The appropriate advices are given to counterparts on the above matter taking the real circumstances of each Department into consideration whenever it seems to be necessary.

(4) Post-graduate programme

Post-graduate programme was established in the field of Civil Engineering in this Thai fiscal year 1996 jointly with SIIT and has been successfully managed. In other Departments, the establishment of post-graduate programme is also under consideration.

(5) Seminar on academic system

Dr. Osamu Kusakabe introduced the academic system adopted at Hiroshima University and Thai speaker explained his experiences acquired during his studying in University of Tokyo at the seminar held on March 12,1996

(6) Publication of annual report and newsletter

a. Annual Report : published in Thai language in 1995

b. Newsletter : No.1 - September, 1995

No.2 - June, 1996

No.3 - under preparation

(7) Staff development and staffing plan

a. Faculty profile as of June 30,1995

Department	Classification by degrees of Faculty member			Total	Studying	Total
	B	M	D	Staying	abroad	
Electrical Eng.	4	6	0	4	6	10
Industrial Eng.	4	4	1	6	3	9
Civil Eng.	2	7	6	13	2	15
Chemical Eng.	4	2	0	4	2	6
Mechanical Eng.	2	2	0	2	2	4
Total	16	21	7	29	15	44

B : Bachelor M : Master D : Doctor

b. Faculty profile as of March 31,1997

Department	Classification by degrees of Faculty number			Total Staying	Studying abroad	Total
	B	M	D			
Electrical Eng.	8	9	0	11	6	17
Industrial Eng.	8	6	2	9	7	16
Civil Eng.	5	4	8	10	7	17
Chemical Eng.	5	3	0	3	5	8
Mechanical Eng.	3	5	0	7	1	8
Total	29	27	10	40	26	66

B : Bachelor M : Master D : Doctor

c. Future staffing plan

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

(8) Academic exchange with foreign Universities

(a) Tokyo Institute of Technology : August 8,1996

(b) Faculty of Engineering, Saitama University : March 26,1997

Progress

of

the Activities of the Project

to enhance the Capability of the Faculty of Engineering

at Thammasat University

during April 1, 1994 - March 31, 1997

April 30, 1997

CONTENT

Part-1 Input from the Japanese Government

1. Dispatch of JICA Experts

1.1 Long-term Expert

(Chief Advisor)

Name : Dr. Minori Sano

Term : June 24, 1994 ~ June 23, 1997

(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 ~ Present

(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

(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

(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 ~ Present

(Department of Mechanical Engineering)

None up to present.

1.2 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 Oginwara

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

(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 ~ July 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

Name : Dr. Kazuo Nakamura

Position : Professor of Nagaoka University of Technology

Field : Ergonomics

Term : November 7, 1996 ~ February 28, 1997

Name : Dr. Ario Osato

Position : Professor of Nagaoka University of Technology

Field : System Engineering

Term : February 24 ~ June 23, 1997

(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 Ohsawa

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"

(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 : Mr. Shuichi Tsukahara

Position : Shimadzu Scientific Engineering Service, Tokyo, Ltd.

Field : Installation of Gas Chromatograph

Term : February 24 ~ March 1, 1997

Name : Dr. Hiroo Niiyama

Position : Professor of Tokyo Institute of Technology

Field : Catalysis and Chemical Reaction Engineering

Term : March 2 ~ March 18, 1997

(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.

2. Training of Counterpart Personnel in Japan

(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.

(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.

(Department of Civil Engineering)

Name of Counterpart : Mr. Watanachai Smittakorn

Position : Lecturer

Term : March 29 ~ April 26, 1995

Field : Wind and Earthquake Engineering

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

Supervisor : Professor Hiroki Yamaguchi

Name of Counterpart : 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 of Counterpart : 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

(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

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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.