タイ王国

エネルギー管理者訓練センター

環境保全技術調査員（第４次）

報告書

2002 年 3 月

国際協力事業団

目　次

第1章 環境保全技術調査（第4次）の派遣

1　調査団派遣の背景・経緯

タイ国は近年の急速な経済成長に伴い、一次エネルギー消費も年率約10%で伸長してきたが、一次エネルギーの多くを輸入に頼る同国にとってエネルギー需要の管理は重要な政策課題となっており、また地球温暖化ガス（GHG）排出抑制の観点からもその重要性は増している。こうした背景のもと、同国政府は1992年に「省エネルギー促進法」を公布し、一定水準以上のエネルギーを消費する工場・施設においては「エネルギー管理者」の配置を義務づける等、省エネルギーの推進を図ってきた。しかしながら、同国におけるエネルギー管理者となる人材の数・能力は不足しており、民間部門における省エネルギーは十分に進展していない現状にある。

このため、タイ国政府は科学技術環境省エネルギー開発推進局（DEDP）の下に「エネルギー管理者訓練センター」を開設し、同センターにおいてエネルギー管理者、およびその指導者の養成・訓練を行うとともに、エネルギー管理者を対象とした資格試験制度を導入することを計画した。

一方、わが国は平成12年度の積極型環境保全協力事業として環境保全技術調査員〔第1次～第3次〕を派遣し、プロジェクト方式技術協力事業としての実施可能性・協力内容・詳細計画及び供与機材の内容について調査を終了し、1月にはR/Dを締結する方向でタイと合意している。今回の調査は、初年度の円滑な実習開始のための環境を整備することを目的として、研修用ミニプラント設置場所の設計図面を作成し、かつ、施設建築に関するアドバイスを行うことを目的とする。

2　調査団派遣の目的

プロジェクト実施予定現場での視察・測量及び実施予定機関との協議を通して、研修用ミニプラント設置場所の基本設計図を作成し、施設建築に関するアドバイスを行うことを目的とする。あわせて、POおよびAPOの内容詳細をDEDPと協議して決定する。

3　主要調査項目

(1) 研修用ミニプラント設置場所の基本設計図作成

(2) 施設建築状況調査

(3) 協力計画内容詳細

4　調査団員構成（2名）

研修計画	苗加　順一	（財）省エネルギーセンター国際エンジニアリング部長
機材設置計画	内芝　良吉	（株）鹿島テクノス工事部建設課長

5　調査団日程

2001年12月5日（水）～12月14日（金）

日順	月　日	曜	行　程		宿泊地
			研修計画	機材設置計画	
1	12月5日	水	東京（10:55　JL717）　→　バンコク（15:50）		バンコク
2	6日	木	JICA事務所打ち合わせ	DEDP・ECCTと協議（実習設備・建物）	〃
3	7日	金	DEDP・ECCTと協議（RD）	実習プラント予定地及び省エネビル視察	〃
4	8日	土	実習プラント設置予定地視察及び設計図面作成作業		〃
5	9日	日	資料整理		〃
6	10日	月	資料整理		〃
7	11日	火	DEDP・ECCTと協議（実習設備・建物） タイ竹中（情報収集）		〃
8	12日	水	DEDP・ECCTと協議（RD、実習設備・建物）		〃
9	13日	木	JICA事務所報告、JETROタイ報告		〃
10	14日	金	バンコク（08:35　JL708）　→　東京（16:10）		

注1：DEDP: Dept. of Energy Development & Promotion　（科学技術環境省エネルギー開発推進局）

注2：ECCT: Energy Conservation Center of Thailand　（タイ省エネルギーセンター）

6　面談者名簿

日本側

中本　明男	JICAタイ事務所員	

タイ側

Mr.Banchong	DTEC	Japan sub-division	Chief
Ms.Tanyapon			
Ms.Suree	DEDP	BERC	
Mr.Sitichok		TD	
Mr.Yurasak		TD	
Mr.Peerapol		TD	
Mr.Manaswee		TD	
Mr.Ponsak		TD	
Ms.Kanchana		TD	
Ms.Supnnee		TD	
Mr.Santi		TD	
Mr.Apichat		TD	
Mr.Soonchai		TD	
Mr.Visoot	DEDP	Design Div	
Mr.Amonsak		Design Div	
Mr.Annchat		Design Div	
Mr.Somwang		Design Div	
Mr.Prawat		Design Div	
Mr.Wuttikon		Design Div	
Mr.Chartdanai	Team Consultant Engineering & Management Ltd.		
Ms.Amonrat	ECCT		
Ms.Pijarana	ECCT		

第２章　調査員所見

１．プロジェクトの実行計画

前回のミッションにおいて、プロジェクトの実行計画に関して TSI、PDM、PO 及び APO についてタイ側と合意したが、今回新たに提示した ATSI に盛り込まれた初年度短期専門家派遣計画について合意した。

RD の最終案については、若干の修正はあるもののほぼ原案通り合意した。
RD については、JICA タイ事務所・中本職員が主管でとりまとめられ、調査員からは必要に応じて補足した。

２．実施サイトの状況

実施サイトとなる省エネルギービルディングは、2002 年 7 月の完成目標に向かって鋭意建設工事が進められており、現在は空調用ダクトや送気ファンの設置工事、天井埋め込み照明器具の取りつけ工事、等が行われていた。
工事は順調に進んでおり、DEDP 研修課の同ビルへの移転時期は 2002 年 10 月になるとの見通しには変更がなかった。

ミニプラントの設置建物については、その基本設計のため日本人設計技師とともに現地を訪問し、設置環境等を視察した。　現地はかなりの湿地帯であり建物や周辺構造物の不等沈下防止のための対策に充分留意する必要があろう。

３．供与機材及びミニプラント設置建物の調達

前回ミッションにおいて決定したミニプラント、研修機材、及び計測機材の供与リストについては特に問題はなく変更なしに合意した。

ミニプラントの調達スケジュールとそれらを設置する建物の建設スケジュールについて、付属資料１の通り確認した。

なお、前回ミッションにおいて、建設費用として ENCON ファンドからの 1,100 万バーツ（約 3,000 万円）の予算を取得済みであることを確認したが、最終的な NEPO からの承認は 12 月末～翌年１月となりそうである。

一方、建設費用について、現地日系企業から概算費用を聞いたところ、本体のみであれば 2,000 万円以下で建設可能とのことであり、DEDP の予算額には問題なさそうである。

4．ミニプラント設置建物の基本設計

DEDP サイドからは、研修課の他に設計課のスタッフも参加し、日本側から提示した基本設計案をベースに、ミニプラント設置エリアと講義室・事務室・公共スペースに区分して、詳細な打合せを行なった。

設計課では、日本側からの事前情報をもとに概念設計を終えており、確認作業はスムースに実施することができた。

ミニプラント設置エリアに関しては、供与する設備の設置位置、タイ側から供与されるユーテリティの供給条件や取り合い個所、等日本側の要求を詳細に検討し原案通り最終合意を得た。

また、講義室等の部分については、研修規模やカリキュラムによって設計が大きく変わることもあり、基本的考え方（講義室・事務室・機材倉庫・トイレの数等）のみ確認した上で、詳細設計はタイサイドに任せることとした。

基本設計に関する双方の合意事項は付属資料２および３の通りである。

ミニプラントの入札図書作成のために、タイサイドの建物詳細設計図面が必要であり、2002 年 1 月末までに送付してもらうこととした。

5．まとめ

前回ミッションで積み残しとなった確認事項や懸案事項についてはほぼ解決され、近々署名予定の RD の内容及び 2002 年 4 月のプロジェクト開始のための条件が整備された。
残された課題としては、ミニプラント用新設建物の予算措置の確認であろう。

以　上

付属資料

1　実習装置設置スケジュール

2　Confirmation of the results on the 4th mission

3　質疑応答書およびその英訳

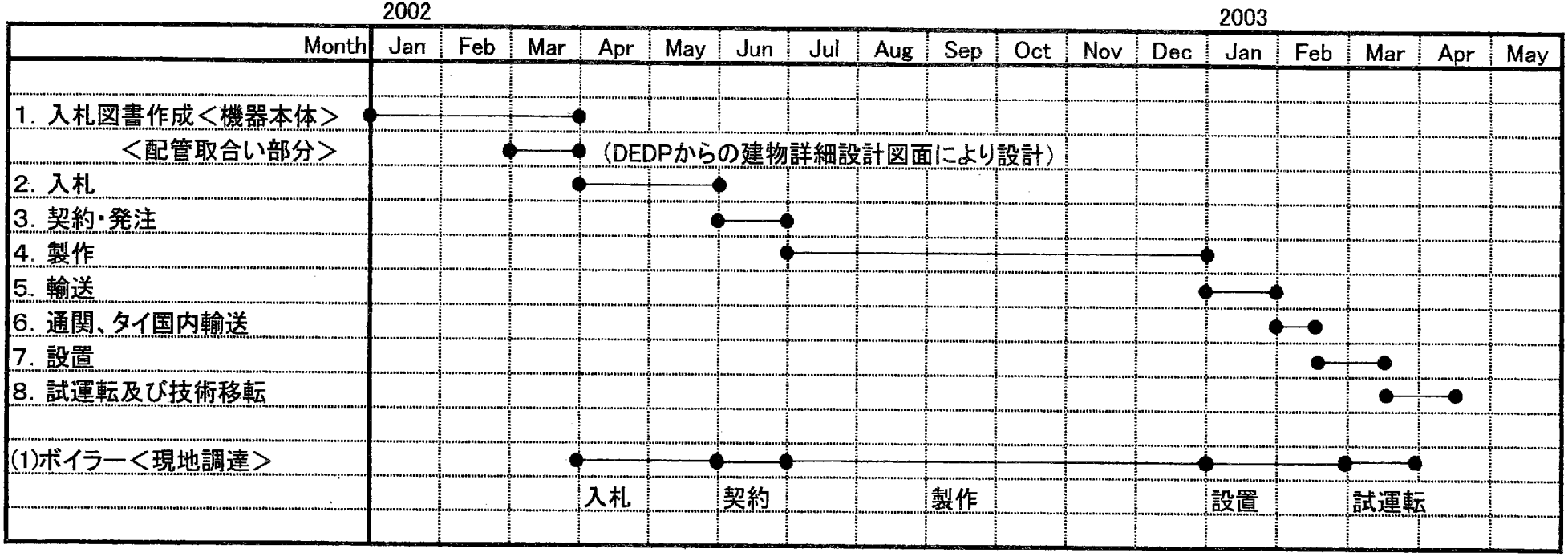
（Questionnaire for Basic Design）

4　PDM（英・日）

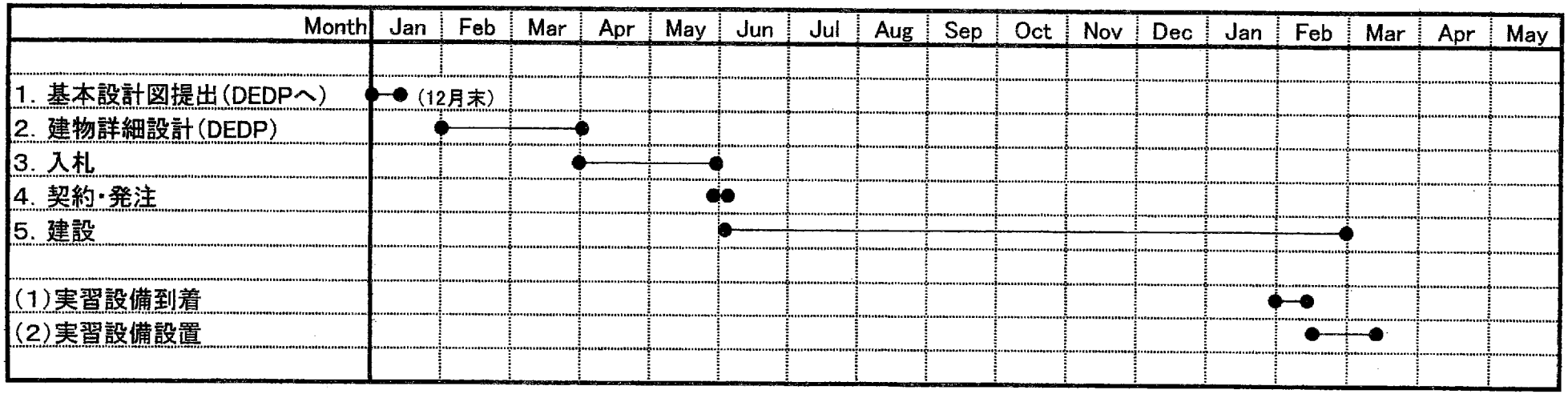
5　実習施設基本設計図（タイ案）

実習装置設置スケジュール（案）

13 Dec. 2001



実習用建物建設スケジュール （案）



Confirmation of the results on the 4th mission

Rev1. Dec.13, 2001
Dec. , 2001

Items	Results
(1) time schedule for procurement, delivery and location of practical facilities	The schedule (attachment - 3) was confirmed.
(2) schedule of construction of the new training building	Ditto
(3) person in charge (design, implementation) of piping and wiring of connecting practical training equipment and utility supplied from Thai side.	Design and procurement : Manufacturer of Equipment Installation : Constructor of Building Primary utilities is supplied up-to about 1 m inside of the building by Thai-side. The points where utilities are supplied will be pointed by Thai-side.
(4) outlet standard ・voltage :380V or 220V ・frequency :50Hz or 60Hz ・type :3 phase 3 lines or 3 phase 4 lines ・socket :voltage、type	 380V (3phases/4lines) 220V (single phase) 50Hz 220V, 3 holes (100V use is not applied.)
(5) fuel ・main burner of furnace ; diesel oil (standard/specific gravity, calorie, pour point etc.) ・pilot burner of furnace : NG and LPG (standard/composition, specific gravity, calorie,etc) ・open burner for demo: diesel oil and NG(or LPG) ・NG and LPG are standard by cylinder. What is the location regulation for cylinder? Is there location obligation of leaking prevention facility (eg. Blocking facility in case of leakage)?	 Diesel oil (ECCT will inform us of the specification of oil.) LPG (ECCT will inform us of the specification of oil.) diesel oil and LPG DEDP will check and inform JICA later of regulation to installation of storage facility for oil and LPG

For drawing the conceptual design of a building for a training plant (mini-plant)

Items	Results
(1) reconfirmation of building specification	
1) site area	A site-area, building direction, an access road, etc. are confirmed at the site.
2) building size (40000w × 15000d × 5000h)	Total area for building including lecture rooms, number of toilet, an entrance, etc will be decided by DEDP. Confirmed the site-area to be kept for the training equipment. (24,000w × 16,000d × 5,000h) 2 stories building would be considered up to DEDP.
3) floor load (maximum load is burner 700kg/m^2)	1,000kg/m^2 will be taken for design.
4) interior specification ・built-in space to practice facility (burner, pump, fan, compressor、steam trap, boiler, outlet board, shared space) ・number and extent of lecture room (2 rooms × 20 ~ 30persons : depends on the scale of lecture) ・office room (1room × 4persons) (equipment such as desk × 4、text・materials storage space、locker、facsimile、copier、PC etc.) ・measuring equipment storage room (2 rooms、storage room for both electricity and heat) ・space for sample display etc. ・shared space such as toilet、lounge、etc.	The sufficient space will be provided as mentioned above. 2 lecture rooms (each for 45persons and 30 persons) 1 office room for 4-5 persons to add 1 living room Confirmed to be considered by DEDP Confirmed Lounge is to be combined to an entrance area. The number of toilet was confirmed.

Items	Results
5) air conditioning ・natural ventilation for practice facility space (ceiling ventilation fan) ・air conditioner for instructors room、lecturers room ・Is air conditioning necessary for other spaces?	Confirmed The installation is confirmed. An entrance and lounge are furnished with air-conditioner. Partition between lounge and training room be installed.
(2) utility supply	
1) electricity、water、natural gas (or LPG)、kerosene (or diesel oil) for training equipment	Electricity : 150kw 120kw for practical equipment 30kw for lighting and socket (detailed conditions to be informed by ECCJ later) Water : $2m^3/h$ $1m^3/h$ for cooling of furnace $1m^3/h$ for boiler feed LPG : $10Nm^3/h$ (20kg/h) Diesel oil : 25L/h
2) battery limit of provider	Inside of the training building
(3) environment regulation	
1) water temperature of drainage of boiler blow water	detailed conditions to be informed by DEDP later
2) other laws or regulations	None

質　疑　応　答　書

２００１年１２月４日

工事名称：タイ・エネルギー管理者訓練センタープロジェクト

会社：㈱鹿島テクノス

担当：内芝良吉

番号	質　問　事　項	ﾚﾍﾞﾙ	結　果
１全体	建設敷地を想定した全体計画図を作成いたしました。		
	（１）人や車の動きを確認して下さい。	DEDP	現場確認
	（２）研修生や講師の駐車場は別敷地で良いですか？	DEDP	現場確認
２計画	所要室の基本プランを提案します。		
	（１）実習室は参考図面のような機器が設置されます。施設の広さや高さは希望寸法です。	○	機器実習室 24m*16m*5h の確保
	（２）ファン室と２つの計器室は確保して下さい。	○	確認
	（３）教室は最大４５人（通常 30 人程度）の２室を計画：国家試験会場としても使用可能と想定しています。	DEDP	2F に確保
	（４）便所：男女の利用比率はいかがでしょうか？	○	1F2+2　2F4+4 の計画
	（５）ラウンジ：休憩時間の利用方法はいかがですか？自動販売機等が設置されますか？	DEDP/	
	（６）展示：模型の展示やパネル展示を想定しています。		大きく計画
	（７）昼食：場所・厨房の計画は必要ですか？		別途（ﾀｲ方式のﾗﾝﾁ？）
３建築	鉄骨の建物で計画しました：その他の構造でも可能です。スパンは４ｍとしています。	Info	
	（１）高さ：実習室は軒の高さで５ｍ・教室は天井高さ３ｍです。	○	確認
	（２）強度：床１ｔ/㎡以上・仕上げは床塗装としました。		確認
	（３）材料：タイ王国の標準品で対応可能です。		確認
	（４）建具：機器の据付及びメンテナンス時の車輌通行寸法です。窓は採光と換気。天井換気扇対応の吸気ガラリも設置。	○	確認
	（５）材料・工事費：市場価格を知りたい。日本と比較したい。	Info	ｾﾞﾈｺﾝ調査
	（６）施工会社：建設状況はいかがですか？日本は大不況です。		〃
４設備	（１）　電気：一次引込み容量２５０ＫＶＡ必要です。	○	120+30kw 各機器別途確認
	（２）　引込みがどの方角から来ますか？配線方法は埋設か架線方式か？電源箱は建物の中央としていますが変更可能で	/DEDP	確認

	す。		
	（３） 照明：教室５００ルクス・実習場４００ルクスです。	DEDP	確認
	器具の選定等はおまかせします。		
	各エリア別のスイッチとしています。	○	
	（４） コンセント：220V はタイ国の標準品でＯＫです。		220V のみ計画 100V 用はトランス使用で検討
	100V は日本からの持込機材です。（トランスの設置共）	DEDP	確認
	（５） 給水・衛生設備：建築設備として設計手配して下さい。	DEDP	空調範囲含め確認
	（６） 空調換気：同じく建築設備、負荷検討はお願いします。	DEDP	
	（７） 排水：水処理方式はどのようになっていますか？	DEDP	単独処理
	公共下水等の確認	DEDP	
	（８） ガス：天然ガスｏｒＬＰＧ等いかがですか？	DEDP	LPG ﾎﾞﾝﾍﾞ供給（消費量確認
	（９） 煙突：設置条件で建設安全基準・排煙濃度管理等は？		特になし
			（軒高以上日本で計画）
５機器	実習機器は日本から届く。		
	（１） 据付工事：業者の選定と現地調達部品の調達は？	○	範囲・接点の確認
	（２） 機器周り配管、配線工事：日本で仮組確認済み、再組立とする	Info	確認
	（３） 建物内の配管配線：建築図面完成後の設計となるが、日本でするか、タイ国でするのか？	○	建物1ｍ以降日本
	（４） ボイラー・トラップ・燃焼炉・ポンプ・圧空・ファン設備：別紙、参考写真のような物です。	Info	確認
	（５） 試運転調整：日本からの短期専門家		確認
	（６） 予備・消耗品：		
	（７） 維持管理：各機器の原単位測定管理はするのですか？		実習機器仕様による
その他	（１） 建設工事の許可申請はどのようなものがありますか？その費用や時間はいかがでしょう？	DEDP	特になし
	（２） 防火・防犯・耐震対策の対応はされますか？	DEDP	確認
	（３） 保険の取扱いは？	DEDP	なし
	（４） 工事現場の安全対策は：費用負担の範囲等	DEDP	確認
	（５） 什器備品の手配とその予算化	DEDP	確認
	（６） 造園計画や樹木の費用も発生します。	DEDP	確認

Questionnaire for Basic Design

Rev.2 Dec. 13,2001
Rev.1 Dec. 11,2001
Dec. 4, 2001

Project on the Practical Energy Management Training Center

No.	Questions	Requirem't for Basic Design	Results
1 General	Total plan of supposed building site		
	(1) Check the movement of people and traffic.	DEDP	to be considered by DEDP
	(2) Is it good that the parking lot of the trainees and lecturers are in another site?	DEDP	to be considered by DEDP
2 Plan	Basic plan of building		
	(1) Equipment as in the plan for reference are located in the practice room. Size and height of the facility are as requested.	O	Confirmed the site-area to be kept for the training equipment. (24,000w × 16,000d × 5,000h)
	(2) Secure fan room and 2 storage rooms of measuring equipment.	O	confirmed
	(3) 2 lecture rooms are planned for maximum 45 persons (usually about 30 persons).	O	confirmed
	It is supposed to be used for national examinations also. But the final plan depends on DEDP idea.	DEDP	2 lecture rooms (each for 45persons and 30 persons) 1 office room for 4-5 persons to add 1 living room
	(4) toilet: how is the ratio of men and women?	O	2 for female, 2 for male on 1st floor 4 for femail, 4 for male on 2nd floor
	(5) lounge: how is it used on break time? Are vending machines etc. located?	DEDP	to be considered by DEDP
	(6) display: display of models and panels are	DEDP/O	to be considered by DEDP
3 Building	Steel frame is planned for building: other structures are possible also. Span is 4m.	Information	
	(1) height: Height of eaves of the practice room is 5m. Ceiling height 3m for lecture room.	O	confirmed (height of training room is 6m, and office rooms, etc. are 2.5m, lecture rooms is 3m)
	(2) strength: more than 1t／m^2-floor, and finished by floor coating	Information	confirmed
	(3) materials: corresponding to standard of Thailand (Price inspection would be done.)	Information	any comments?-none
	(4) Door and window, etc : width and height vehicle thoroughfare upon set up of equipment and maintenance. Induction outlet ventilator	O	confirmed
	(5) Construction fee: would like to know the market price and compare it with Japanese price	O	budget to be secured by DEDP
	(6) construction company: how is the situation of construction industry? In Japan, it is in grave depression.	Information	any comments?-none

No.	Questions	Requirem't for Basic Design	Results
4 Facility	(1) electricity: 250KW necessary as primary lead-in capacity (120KW for mini-plant and 30KW for lighting) Your additional request would be	O/DEDP	detailed conditions to be informed by ECCJ later
	(2) which direction does the lead-in come from? Is the wiring underground type or overhead type? The outlet box is in the center of the building but enable to change.	O	confirmed as in drawings Only water lines is in pit and electric lines is installed along wall and on floor, as water line and electric line be separated.
	(3) lighting: 500 lux for lecture room and 400 lux for practice site	DEDP	confirmed
	Selection of equipment is up to your side		confirmed
	Switches are for each area.		confirmed
	(4) socket: 220V is OK for standard of Thailand	O	confirmed (location of socket is as in the drawing)
	100V is for equipment carried in from Japan. (location of trans also)	Considered	cancelled —— therefore the equipment supplied by Japan has to be installed with transformer (from 220V to 100V)
	(5) water supply for drinking and toilets : please arrange the design as a building facility	DEDP	any comments?-OK
	(6) air-conditioning and ventilation : building facility as well. Please consider the load.	DEDP/O	any comments?-OK
	(7) drainage: how is the water treatment type? confirmation of public sewer	DEDP/O	any comments?-none
	(8) gas: natural gas or LPG?	O	confirmed (LPG)
	(9) chimney: any regulation for construction safety and management of smoke in location condition	DEDP/O	any comments?-none (Chimney [10-15m height] is designed and provided by Japanese side, and construction including foundation is done by Thai side.)
5 equipment	practical equipment from Japan		
	(1) set-up construction: how about selection of construction company and local procurement?	O	any comments?-none
	(2) Construction of piping and wiring around mini-plant: provisional set-up confirmed in Japan.	Information	OK
	(3) Piping and wiring within the building: designed after the completion of building plan.	O	confirmed (Manifacturer will design following the building detailed design. DEDP will submit detailed building design to JICA within the end of Jan.)
	(4) boiler, trap, burner pump, compressor and fan As in the attached photos	Information	OK
	(5) Test running adjustment	Information	OK (included in a short-term expert's job)
	(6) Spare parts and expendable supplies:	Information	OK (some parts included in equipment)
	(7) Maintenance	Information	OK (included in a short-term expert's job)

No.	Questions	Requirem't for Basic Design	Results
6 others	(1) What kind of permission application are there for construction? How long and how much will it take?	DEDP	any comments?-none
	(2) Is there any measurement for prevention of fire and crimes, and earthquake-proof guideline?	DEDP	any comments?-none
	(3) How about the insurance?	DEDP	any comments?-none
	(4) Safety countermeasures at the construction site: coverage of cost etc.	DEDP	any comments?-to be included in the contract
	(5) Arrangement and making budget of utensil and office equipment such as desks and chaires, etc.	Information	any comments?-none
	(6) Cost for gardening and greenery also arises	Information	any comments?-none
	(7) Canteen for lunch	DEDP	to be considered by DEDP

Project on Practical Energy Management Training Center in Thailand | Duration: 3 years (April 2001 – April 2005) | Implementing Agency in Japan : JICA

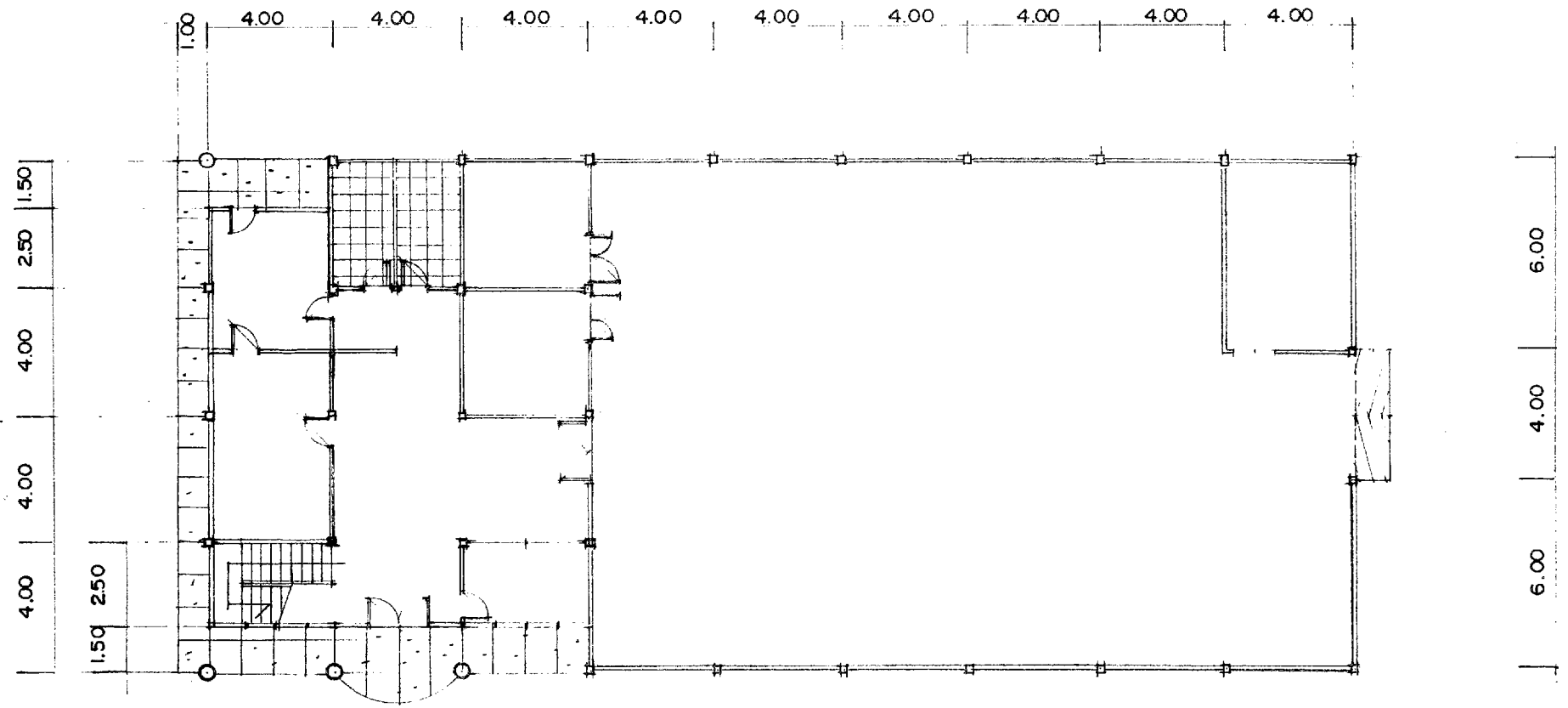
Project Site: Bangkok | Target Group: PRE and Energy Consultants | Implementing Agency in Thailand : DEDP and ECCT

Narrative Summary	Objectively Verifiable Indicators	Means of Verification	Important Assumptions
(Overall Goal) Energy management in designated factories and buildings is effectively executed to meet the objective of the ENCON Act.	• By 2008, more than 80% of designated factories and buildings assigns PRE. • By 2008, more than 70% of designated factories and buildings submits six month energy consumption reports on their energy consumption and conservation.	• Reports of DEDP • Annual reports submitted by designated factories and buildings	a. Related factories and buildings comply with the new systems.
(Project Purpose) High-quality PRE education system is set up.	• By 2005, state examination system for PRE is available and appreciated by the business sectors.	• Reports of DEDP • Interviews and questionnaires to designated factories and buildings	b. Governmental policy is not changed. c. Related factories and buildings as well as Energy Consultants do not protest.
(Outputs) 0. Management system for Practical Energy Management Training Center is established. 1. State Examination system for PRE is prepared. 2. Pre-exam training courses are established. 3. Implementing structure of pre-exam training is established. 4. Follow-up system for PRE is proposed.	By 2005: 0-1 Personnel, budgets and facilities for the Center are secured. 1-1 A guideline for state PRE-examination is established and disseminated. 1-2 A state examination committee is organized and functioned. 1-3 Draft(s) of state PRE-examination is made and revised to meet objectives. 2-1 C/P is able to operate the machinery and equipment without assistance by Japanese experts. 2-2 Curricula for pre-exam training courses are established. 2-3 Training materials for pre-exam training courses are prepared. 3-1 Curriculum for an instructor's training course is established. 3-2 Training materials for instructor's training courses are prepared. 3-3 Pre-exam training courses and state examination for PRE are implemented at least once on trial base. 4-1 A plan for continuously updating the knowledge of PRE is proposed. 4-2 A plan for disseminating the latest information of energy conservation is proposed.	0 Annual reports of Practical Energy Management Training Center 1 A guideline for PRE-state examination, a regulation for national examination committee, draft(s) of examination 2 Project reports, list equipment and maintenance record, curricula and training materials for PRE-training courses 3 Project reports, curricula and training materials for instructor's training courses. Reports of implementation of training courses 4 Proposals to DEDP	d. National budget is properly allocated. e. Personnel who participated in the training courses work as PRE.
(Activities) 0-1 Allocating personnel 0-2 Clarifying each task and function. 0-3 Elaborating annual working and budgetary plan. 0-4 Setting-up and conducting public relations of the Project. 1-1 Establishing the framework of state examination system for PRE. 1-2 Organizing an examination committee.(pilot phase) 1-3 Preparing of draft(s) of the contents of examination. 2-1 Installing and maintaining practical training facilities. 2-2 Preparing demand-reflected curricula of pre-exam training courses. 2-3 Preparing training materials for pre-exam training courses (Lecture and Practice) based on the state examination system. 3-1 Developing and preparing a training course for instructors. 3-2 Implementing a training course for instructors. 3-3 Implementing pre-exam training courses and a state examination on trial base. 4-1 Proposing a plan for continuously updating the knowledge of PREs 4-2 Proposing of a plan for disseminating the latest information of energy conservation.	Inputs JAPAN **Personnel** Long-term Expert - One Chief Advisor - One Project Coordinator - One State Examination System Expert - One Training Course Expert Short-term Expert Dispatched to complement when needed. **Training of C/P in Japan** Approx. three (3) personnel per year **Machinery and Equipment** Training Equipment THAILAND **Personnel** DEDP Officials ECCT Staff **Land, Building and Facilities** - Office space and necessary facilities for the Japanese experts - Office space and necessary facilities for the Thai counterparts personnel - Buildings, facilities and space necessary for the installation and operation of the machinary, equipment and materials to be provided by the Government of Japan - Warehouse for equipment - Lecture rooms and meeting rooms necessary for the transfer of Technology - Other facilities mutually agreed upon as necessary for the implementation of the project		f. Personnel who participated in the training courses work as PRE. g. Provided equipment and machinery pass the customs without delay. (Pre-conditions) • DEDP maintains prestige as the leading department for energy conservation. • High interests are shown in energy conservation.

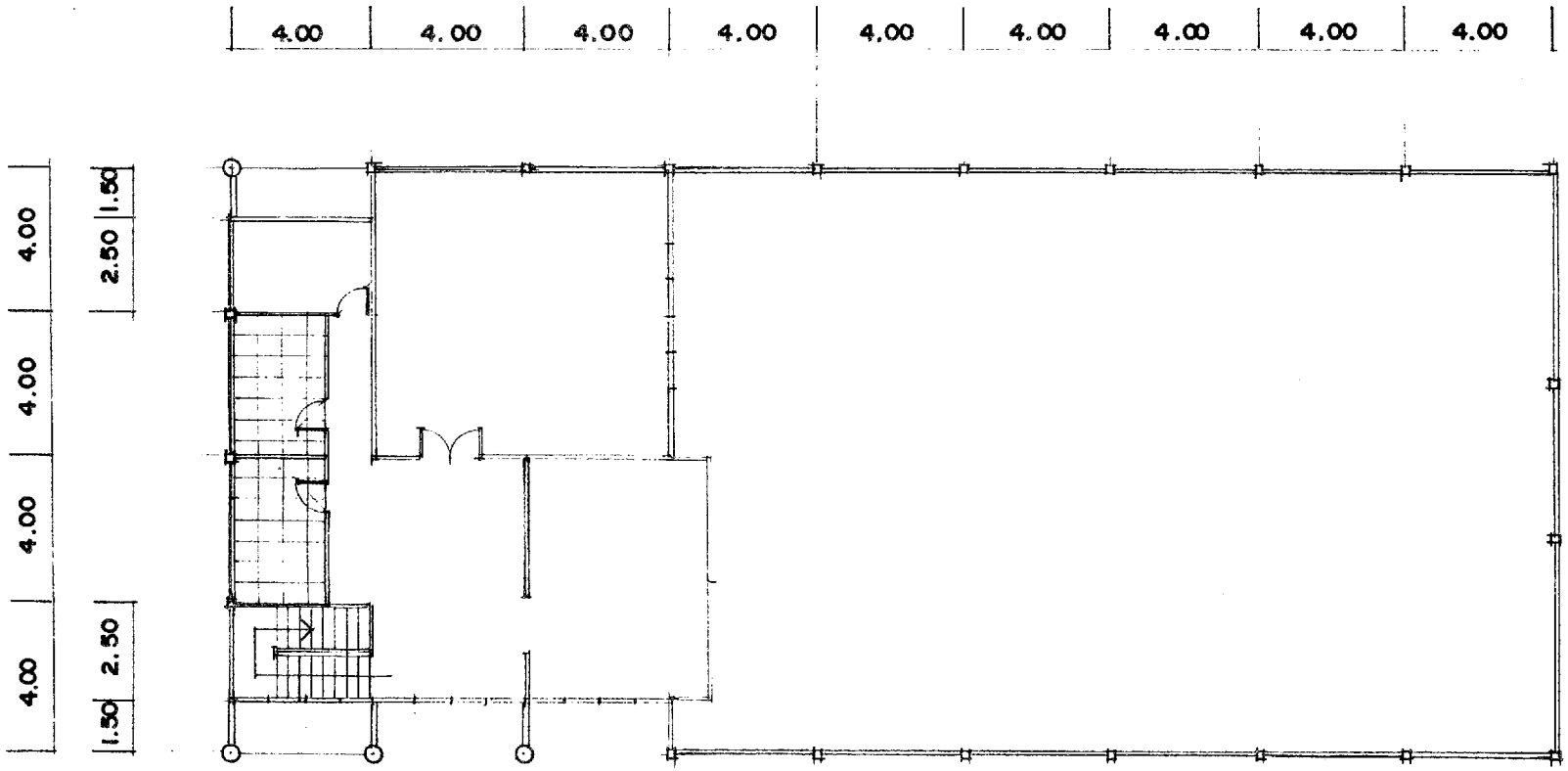
タイ国・エネルギー管理者訓練センタープロジェクト　　期間：2002年4月～2005年4月（3年間）　　日本側実施機関：JICA

対象地域：バンコク　　ターゲットグループ：指定工場・施設のPREもしくは候補者　　タイ側実施機関：DEDPおよびECCT

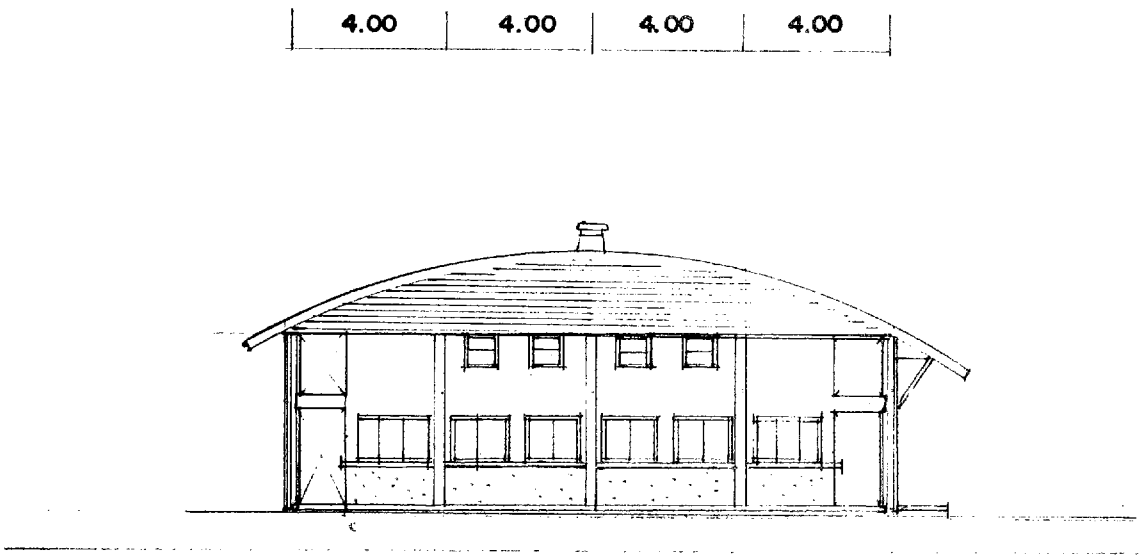
プロジェクトの要約	指　標	指標データの入手方法	外部条件
（上位目標） タイ国の工場・施設のエネルギー管理が、省エネルギー促進法に則り効果的に実施される。	• 2008年までに、PREの選任率が80%以上に達する。 • 2008年までに、70%以上の指定工場・施設から6ヶ月ごとに省エネ報告書が提出される。	• DEDP報告書 • 指定工場・施設による省エネ報告書	a. 関係工場・施設が新制度に対応した行動を取る。
（プロジェクト目標） 高度な技術・能力を持ったエネルギー管理者（PRE）の教育システムが整備される。	• 2005年までに、PRE国家試験システムが制度化され、産業界に認知・評価される。	• DEDP報告書 • 指定工場・施設へのインタビュー／アンケート調査	b. 政府の政策に大幅な変更がない。 c. 関係工場・施設からの反発がない。
（成　果） 0. 訓練センター運営のための管理体制が確立される。 1. PRE国家試験制度が提案される。 2. PRE試験前研修コースが準備される。 3. 試験前研修の実施体制が整備される。 4. PRE支援体制が確立される。	いずれも2005年までに： 0-1 訓練センターの人員・予算・設備が確保されている。 1-1 国家試験の実施要項が確立・公表されている。 1-2 国家試験委員会が組織され、機能している。 1-3 国家試験問題案が作成され、目的に合うよう改訂される。 2-1 日本人専門家の助け無しに実習用機材が運転・維持管理されている。 2-2 PRE試験前研修カリキュラムが確立している。 2-3 PRE試験前研修の研修コース教材が整備されている。 3-1 講師向け研修カリキュラムが確立している。 3-2 講師向け研修コース教材が整備されている。 3-3 PRE試験前研修および国家試験が少なくとも1回試行実施される。 4-1 PREの知識のアップデイトのための企画書が作成・提出される。 4-2 省ｴﾈﾙｷﾞｰに関する最新情報を提供する手法に係る企画書が作成・提出される。	0 訓練センターの事業報告書 1 国家試験実施要領、試験委員会規約、試験委員会議事録 2 プロジェクト報告書、機材リスト・管理台帳 試験前研修カリキュラム・教材 3 プロジェクト報告書、講師向けカリキュラム・教材、 PRE国家試験・研修試行実施報告書 4 DEDPへの企画書	d. 予算措置が講じられる。 e. 研修を受けた人材がPREとして勤務する。
（活　動） 0-1 人員を配置する。 0-2 業務分掌を明文化する。 0-3 業務活動・予算計画を作成する。 1-1 PREのための国家試験制度の枠組みを確立する。 1-2 試験委員会を組織する。 1-3 国家試験問題（案）を作成する。 2-1 実習用機材を設置し、維持管理する。 2-2 要望に沿った試験前研修のカリキュラムを準備する。 2-3 国家試験に基づく試験前研修コースの教材（座学及び実習）を作成する。 3-1 講師向けの研修コースを開発・準備する。 3-2 講師向けの研修を実施する。 3-3 PRE向けの試験前研修及び試験を試行する。 4-1 PREの知識のアップデイトのための方法を提言する。 4-2 省エネルギーに関する最新情報を提供する手法を提言する。	投　入 日本国 人　材 長期専門家 チーフアドバイザー　1名 国家試験専門家　1名 研修コース専門家　1名 業務調整員　1名 短期専門家 必要に応じて派遣 研修員受入 約3名／1年 機　材 研修機材 タイ国 人員の配置 DEDP ECCT 土地、建物及び施設 ・日本人専門家のための事務室及び必要な施設 ・タイ側要員のための事務室及び必要資機材 ・日本政府によって供給される機器を設置し運転するために必要な建物及びスペース ・機器の倉庫 ・技術移転に必要な講義室及び会議室 ・その他プロジェクトの遂行に必要な双方合意した機材		f. 日本から供与された機材が遅滞なく通関される。 g. 研修を受けた人材がPREとして勤務する。 （前提条件） • 省エネルギーへの関心が高い。 • DEDPが省エネ政策部局としての地位を維持する。



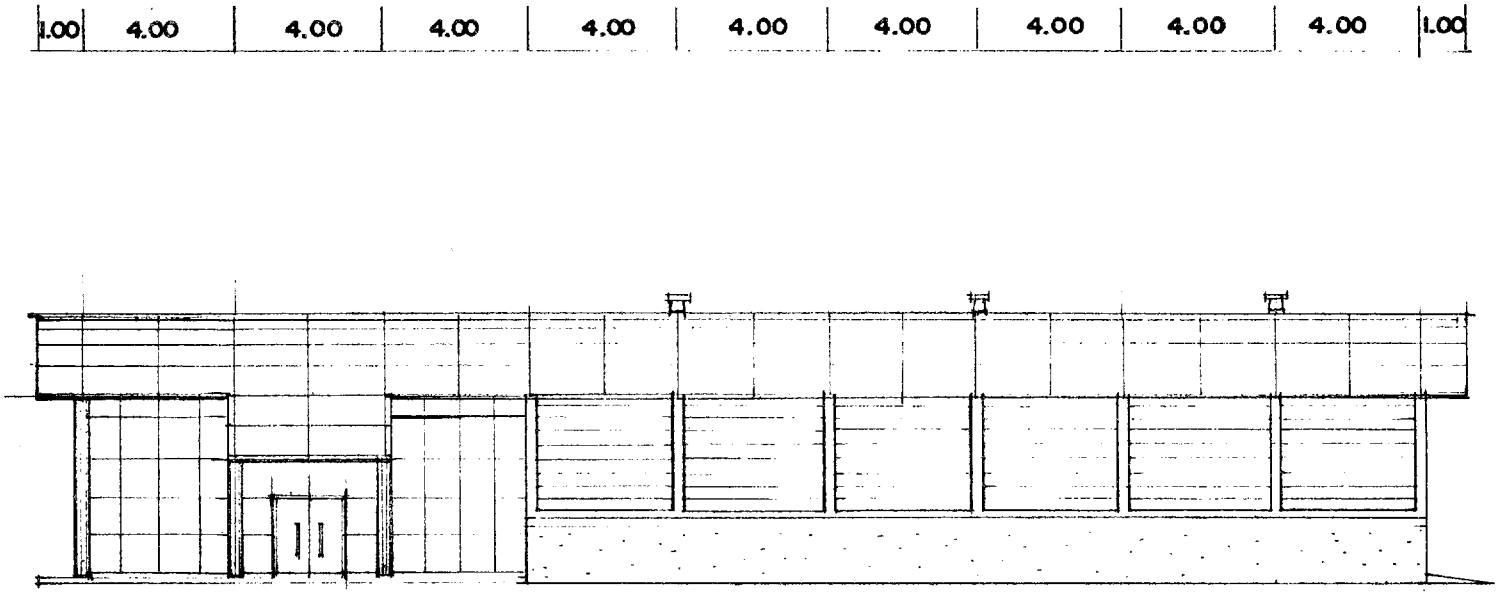
GROUND FLOOR PLAN 1:200



MEZZANINE FLOOR PLAN 1:200



SOUTH ELEVATION 1:200



EAST ELEVATION 1:200

6．実施協議（R／D署名）に関するJICAタイ事務所からの公電及びR／D
（TI／MI 004　2002. 4. 12付け）

Shocho	Jicho (S)	Jicho (K)	Jicho (C)	Jicho (G)	Hancho	Aigi	Tanto
					坂田		渋谷

起案日　平成14年4月11日
決裁日　平成14年4月12日
番号 TI 第 1-12016 号
文書保存期間 第3類（5年）

JICA OFFICIAL FACSIMILE MESSAGE

URGENT　CONFIDENTIAL

RCVD

NO.　PAGE 1 / 5
TI/MI 004 訓練

DATE : 12 APR 2002

To : MD of MI (鉱工業開発協力部長　殿)

From : RR of TI (タイ事務所長)

C.C./ I sent to :

Subject : エネルギー管理者センタープロジェクトに係る国際約束及び R/D の締結（訓練）

□Requests for arrangements □Please reply □For your information □Others

Ref. No. (YOURS)　(OURS)

Please Transfer to :

今般、別添の通り、標記プロジェクトに係る口上書交換（=国際約束の締結）及び R/D 署名を了しましたので報告します。

今般、4月15日来タイ予定の4名の長期専門家については、DTEC より口頭にて受入確認を取り付けましたので、併せて連絡します。

以上

添付書類

口上書写（大使館⇔DTEC）
R/D 写（JICA事務所長⇔DEDP局長、表紙のみ）

NOTICE: If you have received this communication in error, please notify the sender immediately. Thank you for your assistance.

Mr Sakata
JICA

TI/MI 004 2/5

No. 041/02

EMBASSY OF JAPAN
BANGKOK

The Embassy of Japan presents its compliments to the Department of Technical and Economic Cooperation (hereinafter referred to as "the Department"), and has the honor to refer to the recent discussions held between the representatives of the Government of Japan and the Government of the Kingdom of Thailand concerning the " Japanese Technical Cooperation Project on the Practical Energy Management Training Center" (hereinafter referred to as "the Project") and to propose the following arrangements:

1. The Government of Japan will carry out the Project in accordance with the relevant laws and regulations of Japan in the Japanese fiscal year (hereinafter referred to as "the JFY") of 2002, subject to the approval of JFY 2002 budget by the Japanese Diet.

2. The Government of the Kingdom of Thailand, in accordance with the Agreement on Technical Cooperation between the Government of Japan and the Government of the Kingdom of Thailand, signed on November 5th, 1981, will accord privileges and other benefits to Japanese experts and their families as well as equipment, machinery and materials in connection with the implementation of the Project in the JFY of 2002.

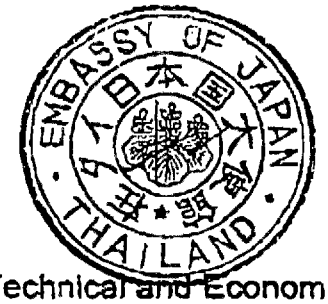
3. The details and procedures for cooperation in the present arrangements shall be provided for in the implementing arrangements which will be agreed upon between Japan International Cooperation Agency (hereinafter referred to as "JICA") and the Department of Energy Development and Promotion, Ministry of Science, Technology and Environment through formal consultation with the Department and JICA.

4. The two Governments will hold consultation whenever necessary for the modification of and addition to the Project in the JFY of 2002.

The Embassy of Japan has further the honor to propose that the present Note and the Department's Note in reply accepting on behalf of the Government of the Kingdom of Thailand the foregoing proposal shall be regarded as constituting an agreement between the two Governments, which will enter into force on the date of the Department's Note in reply.

TI/MI 00 4 [redacted] 3/5

The Embassy of Japan avails itself of this opportunity to renew to the Department of Technical and Economic Cooperation the assurances of its highest consideration.



22,March,2002

Department of Technical and Economic Cooperation
Bangkok

To: K. Suwanna

From: Hataichanok

DEPARTMENT OF TECHNICAL AND ECONOMIC COOPERATION
962 Krung Kasem Road, Bangkok 10100, Thailand
Tel. 0 2280 0980 Fax. 0 2280 1248, 0 2281 7148
Email : dtec-gov @inet.co.th Web Site URL http ://www.DTEC.thaigov.net

URGENT

No. 2112/ 6469

The Department of Technical and Economic Cooperation presents its compliments to the Embassy of Japan and has the honour to acknowledge the receipt of the Embassy's Note No. 041/02 dated March 22, 2002 concerning the "Project on the Practical Energy Management Training Center"

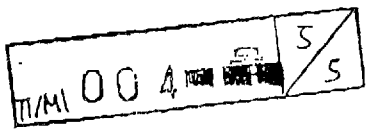
The Department of Technical and Economic Cooperation has further the honour to accept, on behalf of the Government of the Kingdom of Thailand, the proposal set forth in the above-mentioned Note and to agree that the Embassy's Note and this Note shall be regarded as constituting an agreement between the two Governments.

The Department of Technical and Economic Cooperation avails itself of this opportunity to renew to the Embassy of Japan the assurances of its highest consideration.

DEPARTMENT OF TECHNICAL AND ECONOMIC COOPERATION
// April 25 (2002)

The Embassy of Japan,
Bangkok.

BEC/BCD
Japan Sub-Division
Tel. 0 2281 2747, 0 2281 8798
Fax : 0 2282 8798, 0 2280 1248



RECORD OF DISCUSSIONS BETWEEN JAPAN INTERNATIONAL COOPERATION AGENCY AND DEPARTMENT OF ENERGY DEVELOPMENT AND PROMOTION ON JAPANESE TECHNICAL COOPERATION PROJECT ON THE PRACTICAL ENERGY MANAGEMENT TRAINING CENTER

In response to the request of the Government of the Kingdom of Thailand, the Government of Japan has decided to cooperate on the Japanese Technical Cooperation Project on the Practical Energy Management Training Center (hereinafter referred to as "the Project") in accordance with the Agreement on Technical Cooperation between the Government of Japan and the Government of the Kingdom of Thailand signed on November 5, 1981 as well as the Note Verbal No. 041/02 of Embassy of Japan in Thailand dated March 22, 2002 and the Note Verbal No. 2112/6262 of Department of Technical and Economic Cooperation dated April 11, 2002.

Accordingly, the Japan International Cooperation Agency (hereinafter referred to as " JICA"), the executing agency responsible for the implementation of the technical cooperation program of the Government of Japan, will cooperate with the authorities concerned of the Government of the Kingdom of Thailand for the Project.

JICA and the Thai authorities concerned had a series of discussions on the framework of the Project. As a result of the discussions, JICA and the Department of Energy Development and Promotion, Ministry of Science, Technology and Environment agreed on the matters referred to in the document attached hereto.

Bangkok, Kingdom of Thailand, April 11, 2002

Mr. Masaru MORIMOTO
Resident Representative
JICA Thailand Office

Siripom Sailasuta

Ms. Siripom SAILASUTA
Director General
Department of Energy Development and Promotion (DEDP)
Ministry of Science, Technology and Environment (MOSTE)

THE ATTACHED DOCUMENT

I. COOPERATION BETWEEN BOTH COUNTRIES

1. Department of Energy Development and Promotion (hereinafter referred to as "DEDP"), Ministry of Science, Technology and Environment (hereinafter referred to as "MOSTE") will implement the Project on the Practical Energy Management Training Center (hereinafter referred to as "the Project") in cooperation with the Japan International Cooperation Agency (hereinafter referred to as "JICA").

2. The Project will be implemented in accordance with the Master Plan which is given in Annex I as in the form of Project Design Matrix (PDM).
   The tentative schedule of implementation (TSI) for the Project is given as shown in Attachment 1.
   In this relation, the annual tentative schedule of implementation (ATSI) for the first year is also given as shown in Attachment 2. ATSI for the second and third year will be made by both sides.

II. MEASURES TO BE TAKEN BY THE GOVERNMENT OF JAPAN

In accordance with the laws and regulations in force in Japan and the provisions of Article III of the Agreement, JICA will take, at its own expense, the following measures under the technical cooperation scheme of Japan.

1. DISPATCH OF JAPANESE EXPERTS
   JICA will provide the services of the Japanese experts as listed in Annex II.

2. PROVISION OF MACHINERY AND EQUIPMENT
   JICA will provide such machinery, equipment and other materials (hereinafter referred to as "the Equipment") necessary for the implementation of the Project as listed in Annex III.

3. TRAINING OF THAI PERSONNEL IN JAPAN
   JICA will receive the Thai personnel connected with the Project for technical training in Japan.

III. MEASURES TO BE TAKEN BY THAI SIDE

1. DEDP will take necessary measures to ensure that the self-reliant operation of the Project will be sustained during and after the period of Japanese technical cooperation, through full and active involvement in the Project by all related authorities, beneficiary groups and institutions.

2. DEDP will ensure that the technologies and knowledge acquired by the Thai nationals as a result of the Japanese technical cooperation will contribute to the economic and social development of the Kingdom of Thailand.

3. Specific privileges and other benefit necessary for the conduct of the Project will be provided in accordance with the Agreement on Technical Cooperation between the Government of Japan and the Government of the Kingdom of Thailand signed on November 5, 1981.

4. DEDP will take necessary measures to ensure that the knowledge and experience acquired by the Thai personnel from technical training in Japan will be utilized effectively in the implementation of the Project.

5. In accordance with the provision of Article IV-(b) of the Agreement, DEDP will provide the services of Thai personnel and administrative personnel as listed in Annex IV.

6. In accordance with the provision of Article IV-(a) of the Agreement, DEDP will provide the buildings and facilities as listed in Annex V.

7. In accordance with the laws and regulations in force in the Kingdom of Thailand, DEDP will take necessary measures to supply or replace at its own expense machinery, equipment, instruments, vehicles, tools, spare parts and any other materials necessary for the implementation of the Project other than the Equipment provided through JICA under II-2 above.

8. In accordance with the laws and regulations in force in the Kingdom of Thailand, DEDP will take necessary measures to meet the running expenses necessary for the implementation of the Project.

IV. ADMINISTRATION OF THE PROJECT

1. The Director General of DEDP, Ministry of Science, Technology and Environment, as the Project Director, will bear overall responsibility for the administration and implementation of the Project.

2. The Director of Training Division of DEDP (hereinafter referred to as "TD"), as the Project Manager, will be responsible for the managerial and technical matters of the Project.

3. The Working Group, of which members consist of the following organizations, will be organized by the Project Manager to facilitate the effective implementation of the Project.

   - DEDP: Training Division (TD), Bureau of Energy Regulation and Conservation (BERC), Bureau of Energy Study, Research and Development (BESRD), Office of Energy Cooperation (OEC)
   - Energy Conservation Center of Thailand (ECCT)

4. The Japanese Chief Advisor as the Japanese team leader will provide necessary recommendations and advice to the Project Director and the Project Manager on any matters pertaining to the implementation of the Project.

5. The Japanese experts will give necessary technical guidance and advice to Thai counterpart personnel on technical matters pertaining to the implementation of the Project.

6. For the effective and successful implementation of technical cooperation for the Project, a Joint Coordinating Committee will be established whose functions and composition are described in Annex VI.

V. JOINT EVALUATION

Evaluation of the Project will be conducted jointly by JICA, DEDP and the authorities concerned, at the middle and during the last six months of the cooperation term in order to examine the level of achievement.

VI. MUTUAL CONSULTATION

There will be mutual consultation among JICA and DEDP on any major issues arising from, or in connection with this Attached Document.

VII. MEASURES TO PROMOTE UNDERSTANDING OF AND SUPPORT FOR THE PROJECT

For the purpose of promoting support for the Project among the people of the Kingdom of Thailand, DEDP will take appropriate measures to make the Project widely known to the people of the Kingdom of Thailand.

VIII. TERM OF COOPERATION

The duration of the technical cooperation for the Project under this Attached Document will be three (3) years from 15thApril 2002.

ANNEX I	MASTER PLAN (PROJECT DESIGN MATRIX)
ANNEX II	LIST OF JAPANESE EXPERTS
ANNEX III	LIST OF MACHINERY AND EQUIPMENT
ANNEX IV	LIST OF THAI COUNTERPART AND ADMINISTRATIVE PERSONNEL
ANNEX V	LIST OF BUILDINGS AND FACILITIES
ANNEX VI	JOINT COORDINATING COMMITTEE

PDM (Project Design Matrix)

Annex 1

Project Title: "The Project on Practical Energy Management Training Center" Project Period: April 15, 2002 – April 14, 2005

Target Places: Bangkok Target Group: PRE and Energy Consultants

Narrative Summary	Objectively Verifiable Indicators	Means of Verification	Important Assumptions
(Overall Goal) Energy management in designated factories and buildings is effectively executed to meet the objective of the ENCON Act.	• By 2008, more than 60% of designated factories and buildings assigns PRE. • By 2008, more than 70% of designated factories and buildings submits six months energy consumption reports on their energy consumption and conservation.	• Reports of DEDP • six months energy consumption reports submitted by designated factories and buildings	a. Related factories and buildings comply with the new regulations.
(Project Purpose) High-quality PRE education system is set up.	• By 2005, state examination system for PRE is available and accepted by the business sectors.	• Reports of DEDP • Interviews and questionnaires to designated factories and buildings	b. Governmental policy is not changed drastically. c. Related factories and buildings as well as Energy Consultants do not protest.
(Outputs) 0. Management system for Practical Energy Management Training Center is established. 1. State Examination system for PRE is prepared. 2. PRE-exam training courses are established. 3. Implementing structure of PRE-exam training is established. 4. Follow-up system for PRE is proposed.	By 2005: 0-1 Personnel, budgets and facilities for the Center are secured. 1-1 A guideline for state PRE-examination is established and disseminated. 1-2 A state examination committee is organized and functioned. 1-3 Draft(s) of state PRE-examination is made and revised to meet objectives and situations. 2-1 C/P is able to operate the machinery and equipment without assistance by Japanese experts. 2-2 Curricula for PRE-exam training courses are established. 2-3 Training materials for PRE-exam training courses are prepared. 3-1 Curriculum for an instructor's training course is established. 3-2 Training materials for instructor's training courses are prepared. 3-3 PRE-exam training courses and state PRE-examination for PRE are implemented at least once on trial base. 4-1 A plan for continuously updating the knowledge of PRE is proposed. 4-2 A plan for disseminating the latest information of energy conservation is proposed.	0 Annual reports of Practical Energy Management Training Center 1 A guideline for PRE-state examination, a regulation for national examination committee, draft(s) of examination 2 Project reports, list equipment and maintenance record, curricula and training materials for PRE-training courses 3 Project reports, curricula and training materials for instructor's training courses. Reports of implementation of training courses 4 Proposals to DEDP	d. National budget is properly allocated. e. Personnel who participated in the training courses work as PRE.
(Activities) 0-1 Allocating personnel 0-2 Clarifying each task and function. 0-3 Elaborating annual working and budgetary plan. 0-4 Setting-up and conducting public relations of the Project. 1-1 Establishing the framework of state examination system for PRE. 1-2 Organizing an examination committee.(pilot phase) 1-3 Preparing of draft(s) of the contents of examination. 2-1 Installing and maintaining practical training facilities. 2-2 Preparing demand-reflected curricula of PRE-exam training courses. 2-3 Preparing training materials for training courses (Lecture and Practice) based on the state PRE-examination system. 3-1 Developing and preparing a training course for instructors. 3-2 Implementing a training course for instructors. 3-3 Implementing PRE-exam training courses and a state PRE examination on trial base. 4-1 Proposing a plan for continuously updating the knowledge of PREs 4-2 Proposing of a plan for disseminating the latest information of energy conservation.	**Inputs** **JAPAN** **Personnel** Long-term Expert - One Chief Advisor - One Project Coordinator - One State Examination System Expert - One Training Course Expert Short-term Expert Dispatched to complement when needed. **Training of C/P in Japan** Approx. three (3) personnel per year **Machinery and Equipment** Training Equipment **THAILAND** **Personnel** DEDP Officials ECCT Staff Land, Building and Facilities - Office space and necessary facilities for the Japanese Experts - Office space and necessary facilities for the Thai counterparts personnel - Buildings, facilities and space necessary for the installation and operation of the machinery, equipment and materials to be provided by the Government of Japan - Warehouse for equipment - Lecture rooms and meeting rooms necessary for the transfer of Technology - Other facilities mutually agreed upon as necessary for the implementation of the project Local Cost - Adequate budget for operation of the Project - House-expense, petrol and vehicle for the experts (up to 400,000baht/y)	f. Personnel who participated in the training courses work as PRE. g. Provided equipment and machinery pass the customs without delay. **(Pre-conditions)** • DEDP maintains prestige as the leading department for energy conservation. • High interests are shown in energy conservation.

Annex II LIST OF JAPANESE EXPERTS

1 Chief advisor as a long-term expert (three (3) years from April, 2002)
- Provide necessary recommendations and advice to the members of the Project and relevant organizations
- Assist planning of strategy / institutional framework / relevant activities comprehensively
- Coordinate Japanese experts and related organizations from managerial and technical aspects

2 Project Coordinator as a long-term expert (three (3) years from April, 2002)
- Assist chief advisor in II-1 above to conduct the Project smoothly
- Assist planning of strategy / seminar / event / relevant activities technically
- Coordinate Japanese experts and related organizations from administrative aspects

3 State Examination Technology expert as a long-term expert (three (3) years from April, 2002)
- Work on technology transfer of these specific fields to the counterparts

4 Training Course expert as a long-term expert (three (3) years from April, 2002)
- Work on technology transfer of these specific fields to the counterparts

5 Short-term experts in the specific fields of technology transfer may be dispatched, if necessary.
In this relation, specific fields of short-term experts for the first year are listed as shown in Attachment 3. Specific fields of short-term experts for the second and third year will be considered by both sides.

Annex III LIST OF MACHINERY AND EQUIPMENT

1 Machinery, equipment and materials for energy management training and training development in the Project as listed in Attachment 4.

2 Other machinery, equipment and materials regarded as necessary for effective implementation of the Project by both sides.

Annex IV LIST OF THAI COUNTERPART AND ADMINISTRATIVE PERSONNEL

1. Counterpart personnel
   (1) Project Director
   (2) Project Manager
   (3) Technical counterpart personnel from the following organizations of the Working group:
      - DEDP: Training Division (TD), Bureau of Energy Regulation and Conservation (BERC), Bureau of Energy Study, Research and Development (BESRD), Office of Energy Cooperation (OEC)
      - Energy Conservation Center of Thailand (ECCT)

2. Administrative personnel

3. Supporting staff

4. Any other necessary personnel for the smooth implementation of the Project

Annex V LIST OF LAND, BUILDINGS AND FACILITIES

1 Office space and necessary facilities for the Japanese Experts

2 Office space and necessary facilities for the Thai counterpart personnel

3 Buildings, facilities and space necessary for the installation and operation of the machinery, equipment and materials to be provided by the Government of Japan

4 Lecture rooms and meeting rooms necessary for the transfer of technology

5 Other facilities mutually agreed upon as necessary for the implementation of the Project

Annex VI JOINT COORDINATING COMMITTEE

1 Functions

The Joint Coordinating Committee will be held at least once a year and whenever necessity arises. Its Functions are as follows:

(1) To review Annual Work Plan for the Project
(2) To coordinate necessary action to be taken by both sides
(3) To review the overall progress of the Technical Cooperation Program as well as the achievement of the Annual Work Plan
(4) To exchange views on major issues arising from or in connection with the Technical Cooperation Program

2 Composition

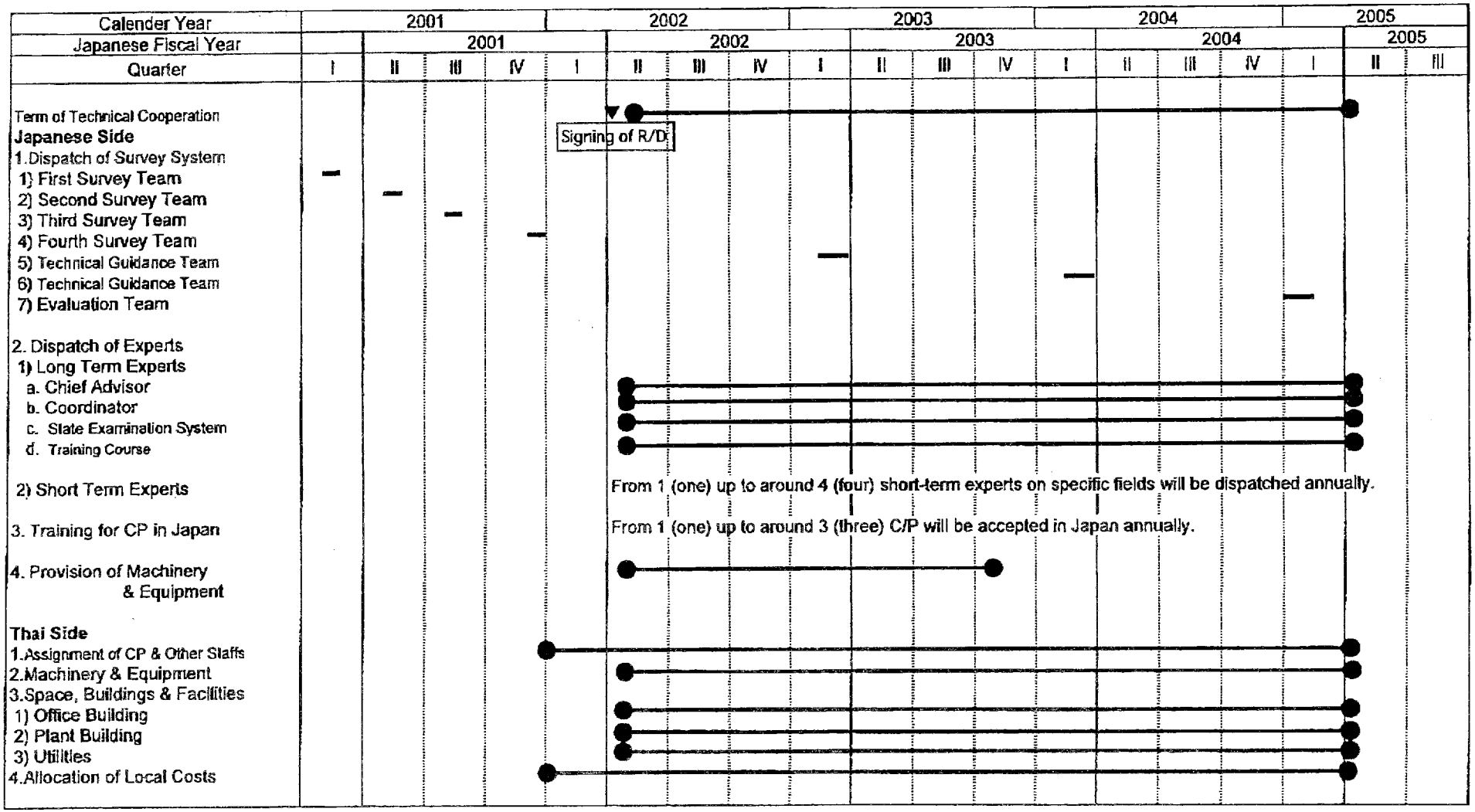
(1) Chairman
Director General of DEDP

(2) Committee Members
(Thai side)
a. Representative(s), from Ministry of Science Technology and Environment
b. Representative(s), from DEDP
c. Representative(s), from ECCT
d. Representative(s), from Department of Technical and Economic Cooperation (DTEC)
e. Representative(s), from National Energy Policy Office (NEPO)
f. Project Manager, TD of DEDP
g. Other personnel concerned with the Project decided by the Thai side

(Japanese side)
a. Chief Advisor
b. Coordinator
c. Japanese Expert(s) designated by the Chief Advisor
d. Representative(s) of the JICA Thailand Office
e. Other personnel concerned to be decided and dispatched by JICA, if necessary

Note: The Official(s) of Embassy of Japan in Thailand may attend the Joint Coordinating Committee as observer(s).

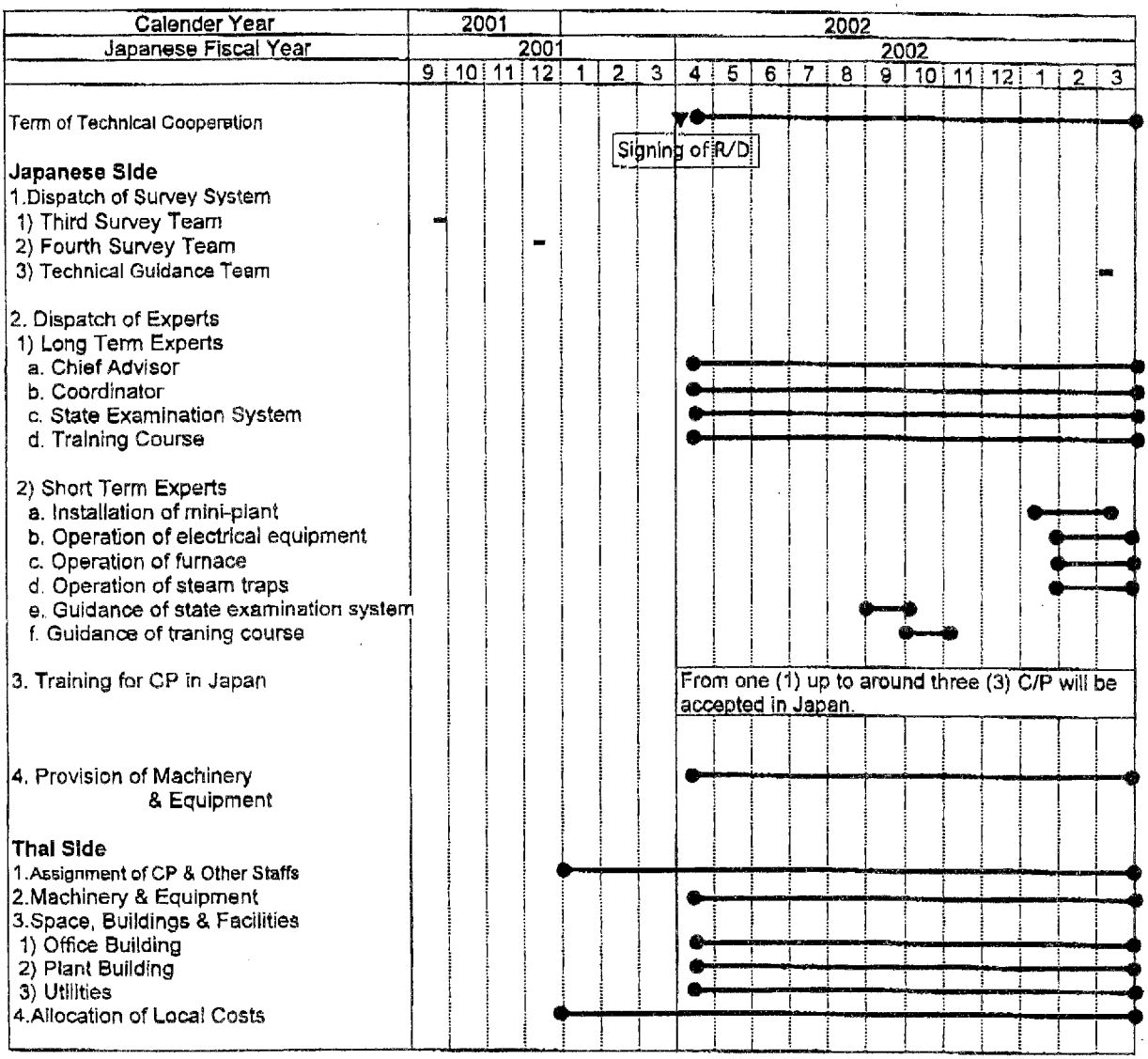
Attachment 1 Tentative Schedule of Implemeㅤlion (TSI)



Note:

1. Japanese fiscal year starts in April and ends in March.
2. Thai fiscal year stars in October and ends in September.
3. This schedule is subject to change if necessary, such as with the progress / budgetary constraint of the Project.

Attachment 2 Annual Tentative Schedule of Implementation (ATSI) (FY2001-2002)



Note:

1. Japanese fiscal year starts in April and ends in March.
2. Thai fiscal year stars in October and ends in September.
3. This schedule is subject to change if necessary, such as with the progress / budgetary constraint of the Project.

Attachment 3

JAPANESE SHORT-TERM EXPERTS (April, 2002 – March, 2003)

The Japanese short-term experts listed below will be dispatched during the first year of the Project. The Thai side understood that the numbers, fields, and the term of the Japanese experts were subject to change due to the recruitment of the respective experts, the progress of the Project, budgetary constraint. In case of these, JICA will inform the Thai side.

No.	Specific Field	Target Product	Duration
1	Installation of mini-plant	a) Installation of mini-plant b) Test operation of mini-plant	2 month (Jan,2003 -Feb, 2003)
2	Operation of electrical equipment	a) Performance test of electrical equipment of mini-plant b) Transfer of operating technology of electrical equipment to CP including maintenance	2 month (Feb, 2003 -Mar, 2003)
3	Operation of furnace	a) Performance test of furnace of mini-plant b) Transfer of operating technology of furnace to CP including maintenance	2 month (Feb, 2003 -Mar, 2003)
4	State examination system	a) Guidance of state examination system b) Support for CP to make question of examination	1 month (Sep, 2002)
5	Training course	a) Guidance of training course b) Support for CP to make training curriculum	1 month (Oct, 2002)
6	Operation of steam traps	a) Performance test of steam b) Transfer of examination including maintenance technology of steam traps to CP	2 month (Feb, 2003 -Mar, 2003)

Attachment 4

List of Machinery and Equipment to be provided by Japanese side

JICA will start its procurement according to the priority provided in the tables below.

The equipment to be provided will be subject to change due to the budgetary conditions of Japan in future.

1. Training Unit in Mini Plant

No.	Descriptions	Specifications	Q'ty	Purpose and Necessity	Place of Installation
1	Steam Boilor Unit	- small one-through boilor - capacity:500kg/h - pressure:10kg/cm^2 - fuel:diesel or A-fuel oil - including economiser, control system, storage tank and soft water system	1 set	<purpose> - to supply steam to the steam training facilities - to train energy-saving operation technologies for boilors - to practice heat balancing of industrial boilors - to understand the principles of automatic control system and to practice the setting of control constants - to learn water treatment technology <necessity> - It is important to acquire energy-saving operation technologies for those who work in the medium and small enterprises where small boilors are used. This equipment helps to understand the importance of conversion to energy-saving type boilors.	mini-plant in Rangsit
2	Industrial Furnace Unit	- capacity:200,000kcal/h - fuel:diesel or A-fuel oil - including recuperator, contol system and necessary measuring divices	1 set	<purpose> - to practice heat balancing of heating furnaces for industrial use - to practice energy-saving operation of industrial burners - to practice operating the energy-saving equipment (cooling water recovery system) - to practice handling the energy-saving measuring equipment - to practice calculating the energy conservation effect of heat insulating materials for industrial furnaces - to practice combustion control technologies <necessity> This equipment helps - to understand heat balancing of energy consumption and loss in order to achieve energy conservation. - to get well versed in energy-saving operation of industrial burners. For energy conservation of industrial furnaces, combustion control should be carried out properly. - to understand the theory and practical applications of energy-saving equipment and materials through practices of using economizers and heat-insulating materials and heat balancing.	mini-plant in Rangsit

3	Rotating Machinery Unit (Fan Unit and Pump Unit)	- including inverte stem and necessary measuring devices	1 set	<purpose> - to practice using energy conservation technologies of rotating machines - to demonstrate principles of inverters and energy conservation effect - to understand the factors that increase energy consumption such as resistance in the piping system, and to practice technologies for eliminating such factors. - to practice power measurements using a practical clamp watt-hour meter for three-phase connection - to learn the principles of optimum operating technology by using PID control system <necessity> - The required power of rotating machinery depends on the resistance of the piping system and the efficiency of the machine itself. This equipment helps to learn reducing such resistance and improving the efficiency of the machine itself through practical use.	mini-plant in Rangsit
4	Compressed Air Unit	- including control system and necessary measuring devices	1 set	<purpose> - to practice detecting air leakage places - to practice estimating air leakage amounts and setting optimum pressures of compressed air - to understand factors for increasing energy consumption such as resistance in the piping system and to practice technologies of eliminating such factors. <necessity> - Many cases of energy conservation in medium and small enterprises through enhancement of compressed air control have been reported. This equipment helps to learn detecting air leakage places and optimum operation of compressors.	mini-plant in Rangsit
5	Steam Trap Unit	- ball-float trap - thermodynamic trap - bucket trap(2) - disk trap - with sight glass - including steam trap analyzer	1 set	<purpose> - to practice learning the operating principles of many types of steam traps and proper use conditions. - to practice diagnosing a faulty or malfunctioning trap by means of diagnostic equipment - to practice operating a steam condensate recovery system <necessity> - Steam loss through a faulty trap is very large. Also a selection of an improper trap may result in a significant amount of loss. This equipment helps to learn the reasons for these losses	mini-plant in Rangsit
6	Electrical Power Supply Unit	- enough capacity to operate the equipment above	1 set	<purpose and necessity> - to supply electricity to equipment listed above and regulate them	mini-plant in Rangsit
7	Display Board	- written in English	1 set	<purpose and necessity> - to show visually the system of the equipment	mini-plant in Rangsit

2. Lecture Room

No.	Descriptions	Specifications	Q'ty	Purpose and Necessity	Place of Installation
1	TV Set	- multi-system (PAL, SECAM, NTSC)	2	- practical energy management training	mini-plant in Rangsit, ENCON Building
2	VCR	- Hi-Fi, stereo, multi-system (PAL, SECAM, NTSC)	2	- practical energy management training	mini-plant in Rangsit, ENCON Building
3	Visualizer	- projector	2	- practical energy management training	mini-plant in Rangsit, ENCON Building
4	Multimedia Projector	- for computer and video signals	2	- practical energy management training	mini-plant in Rangsit, ENCON Building
5	Scanner	- flat-bed type	1	- practical energy management training	mini-plant in Rangsit
6	Digital Camera	- 2M or more resolutions	1	- practical energy management training	mini-plant in Rangsit
7	White Board	- with copying function	2	- practical energy management training	mini-plant in Rangsit, ENCON Building
8	Screen	- rolling type, approx. 2 x 2m	2	- practical energy management training	mini-plant in Rangsit, ENCON Building
9	Photocopier	- with zooming function	1	- practical energy management training	mini-plant in Rangsit
10	Personal Computer	- notebook	2	- practical energy management training	mini-plant in Rangsit
11	Color Laser Printer	- A3 format	1	- practical energy management training	mini-plant in Rangsit
12	UPS	- capacity:4kW	1	- practical energy management training	mini-plant in Rangsit
13	Video Camera	- digital	1	- practical energy management training	mini-plant in Rangsit

3. Measurement and Analysis

No.	Descriptions	Specifications	Q'ty	Purpose and Necessity	Place of Installation
1	Portable Ultrasonic Flowmeter	- for approx. 12.5-1000mm pipe - fluid temperature:-20 to 100℃ - fluid flow:0-10m/s	1	- to measure flow rate of clean liquids such as boilor feed water and condensate from outside of pipe	mini-plant in Rangsit
2	Air Velocity Meter using Pitot Tube	- pressure:0-2500Pa - velocity:0-50m/s	1	- to measure positive or negative pressure relative to atmosphere or differential pressure obtained from a Pitot tube and to measure air or gas velocity in a duct	mini-plant in Rangsit

3	Non-contact Infrared Pyrometer	- temperature:0- 0℃	1	- to measure temperature c tructure that is not possible to come closer such as rotary kiln surface or pipe lines at high level	mini-plant in Rangsit
4	Portable Thermometer	- temperature:-50 to 1200℃	1	- to measure all kinds of temperatures such as air, water, liquids, surface	mini-plant in Rangsit
5	Portable Clamp-On Meter	- voltage:600V - current:1000A	1	- to measure all kinds of electrical parameters	mini-plant in Rangsit
6	Gas Analyzer	- O_2, CO, SO_2, NOx	1	- to measure combustion efficiency	mini-plant in Rangsit
7	Hot Wire Anemometer	- range:max. 20,000m^3/m	1	- to measure velocity of air in air conditioning ducts	mini-plant in Rangsit
8	Data Acquisition Unit	- portable, with PC program - inside/outside temperature (-20 to 70℃) - relative humidity(0-97%)	1	- to acquire data from measuring device	mini-plant in Rangsit
9	Tachometer	- portable	1	- to measure rotating velocity of motors	mini-plant in Rangsit
10	Lux Meter	- portable	1	- to measure brightness of lighting system	mini-plant in Rangsit

For Internal Uses

ENERGY CONSERVATION PROMOTION ACT B.E. 2535

CONTENTS

THE ENERGY CONSERVATION PROMOTION ACT, B.E. 2535

BHUMIBOL ADULYADEJ REX.
Given on the 2nd day of April proclaim B.E. 2535
Being the 47th year of the Present Reign

His Majesty King Bhumibol Adulyadej has been graciously pleased to proclaim that Whereas it is deemed appropriate to enact an Energy Conservation Promotion law, His Majesty the King, by and with the advice and consent of the National Assembly in the capacity as Parliament, is graciously pleased to enact an Act as follows:

Section 1 : This Act is called **"Energy Conservation Promotion Act, B.E.2535".**

Section 2 : This Act shall come into force on the day following the date of its publication in the Government Gazette.

Section 3 : In this Act,

"Energy" means ability to perform work that is inherent in the sources that may provide work, consisting of renewable energy and non renewable energy, and includes sources that may provide work such as fuels, heat, and electricity

"Renewable Energy" includes energy obtained from sources such as: wood, firewood, paddy husk, bagasse, biomass, hydro power, solar power, geothermal power, wind power, waves and tides.

"Non-Renewable Energy" includes energy from sources such as: coal, oil shale, tar sands, crude oil, oil, natural gas, and nuclear power.

"Fuels" includes: coal, oil shale, tar sands, oil, natural gas, fuel gas, synfuels, wood, firewood, paddy husk, bagasse, garbage, and other materials designated in the

Government Gazette by the National Energy Policy Council.

"**Petroleum**" means gas, gasoline, fuel for aircraft, kerosene, diesel oil, fuel oil, and other oils similar to the above-mentioned and other petroleum products de signated in the Government Gazette by the National Energy Policy Council.

"**Gas**" means liquefied petroleum gas used for cooking, or liquefied hydrocarbon gases, i.e. propane, propylene, normal butane, iso-butane and butylene, each of, or a combination of these gases.

"**Refinery**" means a petroleum refinery, a place where petroleum products are produced and sold. The term also includes a gas separation plant, and petro-chemical and solvent plants.

"**The National Energy Policy Council**" means the National Energy Policy Council under the National Energy Policy Council Act".

"**Energy conservation**" means to produce and use energy efficiently and economically.

"**Inspect**", means survey, audit and collect data.

"**Factory**" means a factory under the laws governing factories.

"**Factory Owner**" includes those who are responsible for the management of the factory.

"**Building**" means a building under the Building Code.

"**Fund**" means fund for promotion of energy conservation.

"**Fund Committee**" means the Committee of the Fund for promotion of energy conservation.

"**Competent officer**" means an officer appointed by the Minister for the execution of work under this Act.

"**Director General**" means the Director General of the Energy Development and Promotion Department or a person assigned by the Director General of the Energy Development and Promotion Department.

"**Minister**" means the Minister of Science, Technology and Energy.

Section 4 : For the benefit of promotion of energy conservation under this Act, the National Energy Policy Council shall have the following authority and duties:

(1) To propose to the Cabinet policies, targets, or measures with respect to energy conservation.

(2) To propose to the Cabinet the making of decrees under Section 8 and Section 18.

(3) To provide recommendations in issuing of the Ministerial Regulations under Section 9, Section 11, Section 19, and Section 23.

(4) To prescribe guidelines, criteria, and priorities for the use of the Fund under Section 28 (1).

(5) To prescribe the types of petroleum that are not required to send contributions to the Fund under Section 28 (5).

(6) To prescribe the rates of the contribution to be sent to the Fund for petroleum under Section 35, Section 36 and Section 37.

(7) To approve a surcharge under Section 43.

(8) To prescribe guidelines, criteria, and conditions in providing promotion and assistance for factories, buildings, producers or distributors of machinery or equipment which has high efficiency, and to manufacturers or distributors of materials used for energy conservation under Section 40.

(9) To carry out other duties as stipulated under this Act.

Prescriptions under (5) and (6) shall be made in the Government Gazette.

Section 5 : The Competent Officer shall deliver a written notice or instruction addressed to any person for the purpose of the execution of this Act between sunrise and sunset or during working hours of the said person, or he shall send the same by certified mail.

In the event that for any reason, delivery cannot be made in the manner prescribed in Clause one hereof, the notice or instruction shall be delivered by posting them at a conspicuous spot at the place of residence, office, or at the house where the addressee is latest registered in the House Registration Certificate, under the laws that govern the census records; or a short announcement may be made in a local newspaper of such area.

After delivery in the manner prescribed in Clause two hereof has been made and seven days have passed, such notice or instruction shall be deemed as received.

Section 6 : The Prime Minister, the Science Technology and Energy Minister, the Industry Minister, the Finance Minister, and the Interior Minister shall have the care and charge of the Act, on the parts that are relevant to their authority and duties.

The Science, Technology and Energy Minister shall have the power to appoint competent officers, issue Ministerial Regulations and prescribe other works for the purpose of the execution of this Act.

The Ministerial Regulations shall take effect upon their publication in theGovernment Gazette.

DIVISION 1
ENERGY CONSERVATION IN FACTORIES

Section 7 : Energy conservation in factories means one of the following measures.

(1) Improvement in combustion efficiency of fuels.

(2) Prevention of energy loss.

(3) Recycling of energy wastes.

(4) Substitution of one type of energy by another type.

(5) More efficient use of electricity through improvements in power factors, reduction of maximum power demand during the period of the electricity system's peak demand, use of appropriate equipments, and through other approaches.

(6) The use of energy-efficient machinery or equipment as well as the use of operation control systems and materials that contribute to energy conservation.

(7) other means of energy conservation as stipulated in the Ministerial Regulations.

Section 8 : Designation of factories, by types, quantities of energy use, or methods of energy utilization, as being "designated factories", shall be made into decrees. The decrees under Clause one hereof, shall come into effect one hundred and twenty days after its publication in the Government Gazette.

Should the owner of any designated factory which is using energy at a level lower than the quantity prescribed in the decrees under Clause one hereof, and will continue to use energy at the said level for a minimum of six consecutive months, the said owner of the such designated factory may submit details together with reasons and file an appeal to the Director General for leniency with respect to having to comply with this Act at all times. In the event that the said appeal has been filed, the Director General shall decide whether such leniency may or may not be granted, and shall notify the owner of the designated factory of the decision in writing promptly.

Section 9 : The owner of the designated factory must conserve energy, audit and analyze energy utilization in his factory, in accordance with the standard, criteria, and procedures as provided by the Ministerial Regulations issued by the Minister under the recommendation of the National Energy Policy Council.

Section 10 : In the event that there are reasonable causes, the Director General may give an instruction to the owner of any designated factory, to furnish factual information on energy utilization for the purpose of inspection, to assure that energy conservation measures are in accordance with the standard, criteria and procedures provided under the Ministerial Regulations issued under Section 9, and the said owner of designated factory must comply within thirty days starting from the date of receipt of such instruction.

Section 11 : In addition to provisions in Section 10, the owner of a designated factory shall have the following duties:

(1) Assign at least one person to take a full-time position at the designated factory to take full responsibility with regard to energy programs. Such person shall have the qualifications as prescribed under Section 13.

(2) Submit information on energy production, consumption, and conservation to the Energy Development and Promotion Department, according to forms and schedule prescribed in the Ministerial Regulations.

(3) Keep records of information on energy consumption and installation or modification of machinery or equipment that affects energy consumption and conservation, in compliance with the criteria and procedures prescribed in the Ministerial Regulations.

(4) Set targets and plans for energy conservation of the designated factory and submit to the Energy Development and Promotion Department, in compliance with the criteria, procedures, and schedule prescribed in the Ministerial Regulations.

(5) Audit and analyze operations to achieve such targets and plans for energy conservation , in compliance with the criteria, procedures and schedule prescribed in the Ministerial Regulations.

The Ministerial Regulations under this Section shall be issued by the Minister under recommendation of the National Energy Policy Council.

Section 12 : The owner of the designated factory shall arrange to have personnel responsible for energy and report to the Director General within one hundred and eighty days after the decrees prescribing designated factories under Section 8 come into effect in the case that such factory has been classified as a designated factory before the date the decrees under Section 8 come into effect, (180 days) after such factory becomes a designated factory in the case of being a designated factory on or after the date the decrees under Section 8 take effect.

Section 13 : The Personnel responsible for energy shall have one of the following qualifications:

(1) Holding a Higher Vocational Certificate and having at least three years experience in the factory, with evidence of work in energy conservation verified by the owner of the designated factory.

(2) Holding a degree in Science or Engineering, with evidence of work in energy conservation verified by the owner of the factory.

(3) Having taken a training course in energy conservation or training course with similar objectives organized or approved by the Science, Technology and Energy Ministry.

Verification of the owner of the designated factory under (1) and (2) shall conform to the form prescribed by the Director General.

Section 14 : The person responsible for energy shall have the following duties:

(1) Periodically maintain and inspect the efficiency of machinery and equipment that uses energy.

(2) Improve upon energy consumption in line with the principle of energy conservation.

(3) Verify the information the owner of designated factory Submits to the Energy Development and Promotion Department under Section 11 (2).

(4) Oversee record keeping of information under Section 11 (3) so that the competent officer may inspect and verify the accuracy of such records.

(5) Assist the owner of the designated factory in setting the goals and plans for energy conservation of the designated factory under Section 11 (4).

(6) Verify the result of the inspection or analysis under Section 11 (5).

(7) Assist the owner of the designated factory to comply with the advice of the Director General under Section 16.

Section 15 : The owner of the designated factory shall keep records of information under Section 11 (3) at the designated factory for a minimum of five years so that the competent officer may have access to and inspect such records.

Section 16 : The targets and plans for energy conservation under Section 11 (4) that the owner of the designated factory must submit to the Energy Development and Promotion Department, must have details on operations plan of the designated factory in order that energy conservation in the designated factory shall meet the standards, criteria and procedures prescribed under the Ministerial Regulations issued under Section 9.

Should the Director General deem such targets and plans for energy conservation as inappropriate, the Director General is responsible for giving advice to the owner of the designated factory to take corrective measures to comply with provisions under Clause one, and for monitoring and following up on the owner of the designated factory to take prompt actions on energy conservation to meet the rectified targets and plans for energy conservation.

DIVISION 2
ENERGY CONSERVATION IN BUILDINGS

Section 17 : Energy conservation inside the buildings means one of the following measures:

(1) Reduction of heat from the sunlight that enters the building.

(2) Efficient air - conditioning, including maintaining room temperature at an appropriate level.

(3) Use of energy - efficient construction materials and demonstration of qualities of such materials.

(4) Efficient use of light in the building.

(5) Use and installation of machinery, equipment, and materials that contribute to energy conservation in the building.

(6) Use of operation control systems for machinery and equipment.

(7) Other measures for energy conservation as prescribed in the Ministerial Regulations.

Section 18 : Designation of any building as a designated building, by types, quantities of energy use and methods of energy utilization in such building, shall be made into decrees.

Provisions of Clause two and Clause three of Section 8 shall apply mutatis mutandis.

Section 19 : For energy conservation inside of the designated building, the Minister, under the recommendation of the National Energy Policy council, shall have the power to issue the Ministerial Regulations prescribing:

(1) The overall thermal transfer value of the building and energy consumption inside the building.

(2) Criteria, procedures and conditions for estimation of the thermal transfer, value of construction materials and the overall thermal transfer value of the building, as well as energy utilization in the building.

(3) Standard for air-conditioning, hot-water and heating systems inside the building.

Section 20 : In issuing the Ministerial Regulations under Section 19, if the Building Control Committee under the laws governing control of buildings deems it appropriate to impose such regulations on control of buildings, under the laws governing control of buildings; such Ministerial Regulations shall be treated as having the same effects as the Ministerial Regulations issued under Section 8 of the Building Code, B.E. 2522. In this event, the authorized persons under the laws governing control buildings, shall have the authority and duties to oversee that construction or modification of such building is in accordance with the said Ministerial Regulations.

In this case, even though the building that may be classified as a designated building, is in the location where there are still no decrees to enforce the laws governing control of buildings, such building shall still be considered as being under the laws governing the control of buildings. This however, is applicable only to the extent that it is related to and for the benefit of the execution of this Act.

Section 21 : The owner of the designated building shall conserve energy, audit and analyze energy consumption in his building in accordance with the standards, criteria, and procedures as prescribed in the Ministerial Regulations issued under Section 19.

The provisions of Section 10 shall apply to the owner of the designated building mutatis mutandis.

Section 22 : Section 11, Section 12, Section 15 and Section 16 shall be enforced upon the owner of the designated building and Section 13 and Section 14 shall be enforced upon the person responsible for energy management employed by the owner of the designated building, whichever is the case, mutatis mutandis.

DIVISION 3
ENERGY CONSERVATION IN MACHINERY, EQUIPMENT AND PROMOTION OF ENERGY - EFFICIENT MATERIALS

Section 23 : In order to conserve energy in machinery or equipment, and to promote the use of energy - efficient materials, the Cabinet, under the recommendation of the National Energy Policy Council, shall have the power to issue the Ministerial Regulations as follows:

(1) To designate machinery or equipment as having high efficiency, according to the types and sizes of the machinery and equipment, the quantities of energy consumption, the rate of energy loss, and the efficiency in energy consumption.

(2) To determine which materials, by types, qualities, and standards, are materials used for energy conservation.

Producers and distributors of high-efficiency machinery or equipment, or materials to be used for energy conservation under Clause one hereof, shall have the right to ask for support and assistance under Section 40.

DIVISION 4
FUND FOR PROMOTION ENERGY CONSERVATION

Section 24 : A fund shall be set up in the Finance Ministry, under the name "Fund for Promotion of Energy Conservation", to be used as working capital and as grants or subsidy in carrying out energy conservation work. The Fund shall consist of capital and property as follows:

(1) The money transferred from the Oil Fund under the laws governing correction and prevention of oil shortages, by the amount prescribed by the Prime Minister.

(2) The contributions delivered under Section 35, Section 36, and Section 37

(3) Surcharges collected under Section 42.

(4) Subsidy from the government, at times as appropriate.

(5) Money or property received from the private sector locally and from overseas, and from foreign governments or international organizations

(6) Interest and other benefits incurred from this Fund.

The Finance Ministry shall keep the money and assets of the Fund and shall handle the procedures in disbursement of the Fund under this Act.

Section 25 : The fund shall be used as follows:

(1) As working capital, grants, or subsidies for investment in and operations of energy conservation programs, or for solving environmental problems resulting from energy conservation programs of the government agencies or state enterprises.

(2) As working capital, grants or subsidies for the private sector for investment in and operations of energy conservation programs or for correction of environmental problems resulting from energy conservation.

(3) As grants or subsidies to government agencies, state enterprises, educational institutions or private organizations, to be used on the following matters:

(a) Energy conservation programs or programs related to environment protection and correction of the problems of the environment resulting from energy conservation.

(b) Study or research projects on energy development, promotion and conservation, environment protection, and correction of environmental problems resulting from energy conservation, and energy policy and planning.

(c) Demonstration projects or pilot projects on energy conservation or environment protection and correction of environmental problems resulting from energy conservation.

(d) Education, training and conferences with respect to energy.

(e) Advertisements, information dissemination, and public relations work, with regard to energy development, promotion, and conservation, and environment protection and correction of environmental problems arising from energy conservation.

(4) Administrative cost of energy conservation promotion work in accordance with this Act.

Section 26 : A private organization entitled to a grant or subsidy under Section 25(3) shall be a juristic person under Thai or foreign laws, whose business is directly related to energy conservation or environment protection and correction of environmental problems arising from energy conservation, and which does not have political or profit oriented objectives.

Section 27 : There shall be a Fund Committee consisting of a Deputy Prime Minister assigned by the Prime Minister as the Chairman, the Permanent Secretary of the Science, Technology and Energy Ministry, the Permanent Secretary of the Industry Ministry, theSecretary General of the National Economic and Social Development Board, the secretary General of the Thai Industrial Standard Institutes, the Director General of the Comptroller

General Department, the Director General of the Energy Development and promotion Department, the Director General of the Public Works Department, the Director General of the Industrial Works Department, the President of the Federation of Thai Industries and the President of the Engineering Institute of Thailand under H.M. the King's Patronage, and not more than seven other qualified persons appointed by the Cabinet as members, and the Secretary General of the National Energy Policy Council who shall be a member and the Secretary to the Committee.

In appointing qualified person as committee members in Clause one hereof, consideration shall be given to the persons who have the knowledge, expertise, achievements, and experience in economics, finance, energy technology, and promotion and protection of the quality of the environment.

Section 28 : The Fund Committee shall have the following authority and duties:

(1) Propose to the National Energy Policy Council guidelines, criteria, conditions and priorities for disbursement of fund in accordance with the objectives prescribed under section 25.

(2) Allocated appropriations from the Fund to be used in accordance with the objectives prescribed in Section 25, provided that they conform to the guidelines, criteria, conditions and priorities prescribed by the National Energy Policy Council under Section 4(4)

(3) Prescribe rules with respect to the criteria and procedures in making requests to allot, and requests for grants and subsidies from the Fund.

(4) Propose the rates of contributions for petroleum to be sent to this Fund to the National Energy Policy Council.

(5) Propose the types of petroleum that shall be exempted from sending contribution to the Fund to the National Energy Policy Council.

(6) Prescribe the surcharges under the approval of the National Energy Policy Council.

(7) Prescribe the exception of surcharges.

(8) Review and approve requests for promotion and assistance under Section 40(2) in accordance with the guidelines, criteria and conditions prescribed by the National Energy Policy Council under Section 4(8).

(9) Prescribe rules with respect to the criteria and procedures in making requests for promotion and assistance under Section 41.

(10) Carry out other duties as prescribed under this Act.

Prescriptions under (3), (7) and (9) shall be made in the Government Gazette.

Section 29 : Qualified members shall hold office for a term of three years. A member who has left office may be reappointed.

Section 30 : Apart of leaving office upon completion of the term under Section 29, a qualified member shall retire from his office upon:

(1) death;

(2) resignation;

(3) being dismissed by the Cabinet on the grounds of negligence, dishonesty, or incompetence;

(4) being adjudged as bankrupt;

(5) being adjudged incompetent or quasi-incompetent;

(6) being convicted and sentenced by a final judgement to imprisonment, except for offenses committed by negligence or petty offenses.

Section 31 : In the event of appointment of qualified member during the term of appointed members, whether it be an additional appointment or an appointment to fill the vacancy, the newly appointed member shall hold office for the remainder of the term of the appointed members.

Section 32 : In the event that the appointed member has completed the term and a new member has not yet been appointed, the retired member shall continue to perform his duties until a new member is appointed.

Section 33 : At any meeting of the Committee, attendance of not less than half of the total membership shall be required to constitute a quorum. In the event that the Chairman is absent from the meeting, the members present shall elect on among themselves to be the Chairman of that meeting.

Any decision of the meeting shall be taken by a majority of votes. In the event of a tie, the Chairman shall cast on extra vote to reach a decision.

Section 34 : The Committee shall have the authority to appoint a sub-committee to review or act upon the matters assigned by the committee, and to invite any person for his presence to furbish facts, explanation, advice, or opinion.

The provisions of Section 33 shall apply to the meetings of the sub-committee mutatis mutandis.

Section 35 : The person who produces petroleum at a refinery and sells it for consumption in Thailand must send contributions to the Fund in proportion with the quantities of petroleum produced and sold for consumption in Thailand, at the rates prescribed by the National Energy Policy Council.

Contributions to be given to the Fund under Clause one hereof shall be sent to the Excise Department together with payment for excise taxes for petroleum, if any, in accordance with the rules prescribed by the Excise Department.

Section 36 : Importers of petroleum for consumption in Thailand shall send contributions in proportion to the quantities of imported petroleum for consumption in Thailand at the rates prescribed by the National Energy Policy Council.

Contributions to be made under clause one hereof shall be sent the Customs Department together with payment of duties for such petroleum, if any, under the rules prescribed by the Customs Department.

Section 37 : Whoever buys or obtains gas from a concessionaire under the laws that govern petroleum, who produces such gas from separation of natural gas, shall send contributions to the Fund at the rates prescribed by the National Energy Policy Council.

Contributions to be sent to the Fund under Clause one hereof shall be sent to the Department of Mineral Resources together with payment of royalty for such gas, if any, under the rules prescribed by the Department of Mineral Resources

Section 38 : In the event that the person who has the duty to send contributions to the Fund under Section 35, Section 36 or Section 37, fails to send contributions or sends less than the amount required, the Excise Department in the case of a producer of petroleum at a refinery and sells for consumption in Thailand, the Customs Department in the case of importer of petroleum, or the Mineral Resources Department in the case of buyer or acquirer of gas from a legal concessionaire under the laws governing petroleum who produces such gas from separation of natural gas, whichever is the case, shall take appropriate actions to start legal proceedings under Section 57 promptly.

In the event that the person who has the duty to send contributions to the Fund fails to do so under Clause one hereof, or sends contributions after the time limit in addition to being liable to offenses under this Act, such person shall also have to pay a surcharge at the rate of three percent per month on the original amount, counting from the date payment is due, and the surcharge shall be regarded as contributions to be sent to the Fund as well.

In computing the time under Clause two hereof, a fraction of a month shall be treated as one whole month.

Section 39 : Contributions to the Fund under Section 35, Section 36 and Section 37 shall be regarded as expenses under the Code of Revenue.

DIVISION 5
MEASURES FOR PROMOTION AND ASSISTANCE

Section 40 : The designated factory or designated building which is required to have an energy conservation program together with machinery, equipment, tools, articles and materials essential for such a program, or a producer or distributor of machinery or equipment which has high efficiency, or materials to be used in the energy conservation programs, shall have the right to request for promotion and assistance as follows:

(1) exemption from paying surcharges under this Act;
(2) grant or subsidy from the Fund under Section 25.

Owners of factories, buildings, or government agencies and state enterprises which are not required to have energy conservation programs under Clause one hereof, but desire to make provisions for machinery, equipment, tools, articles, or operation control systems of their own for the purpose of energy conservation, shall have the right to request for promotion and assistance under Clause one hereof.

Section 41 : Requests for promotion and assistance under Section 40 shall be submitted to the Fund Committee in Accordance with the rules prescribed by the Committee. In considering the requests under Clause one, the Fund Committee may employ any person or organization who is an expert or has expertise on the matter to study and report or give opinion in addition to its own consideration.

The Fund Committee shall review and approve the requests for promotion and assistance according to the guidelines, criteria, and conditions prescribed by the National Energy Policy Council under Section 4(8), and shall inform the government agencies concerned to act upon the resolution of the Fund Committee with respect to providing promotion or assistance to the persons whose requests have been approved.

The Energy Development and Promotion Department shall have the duty to follow-up and assure that the persons who are granted promotion and assistance, shall execute their operations as stated in Clause three hereof, and to report to the Fund Committee.

DIVISION 6
SURCHARGES

Section 42 : Three years after the date the Ministerial Regulations issued under Section 9 or Section 19 take effect in the case of being a designated factory or designated building before the date the Ministerial Regulations issued under Section 9 or Section 19 take effect, or (3 years) after the date of becoming a designated factory or designated building in the case of being a designated factory on or after the date the Ministerial Regulations issued under Section 9 or Section 19 take effect, if any owner of the designated factory or any owner of the designated building violates or fails to comply with said Ministerial Regulations, the owner of the designated factory or the owner of the designated building, whichever is a case, shall pay the surcharges for use of electricity under this Division.

The surcharges for use of electricity under Clause one hereof shall be collected from the designated factory or designated building according to the quantities bought or acquired from EGAT, MEA, or PEA, and such surcharges shall be imposed upon in the same manner as payment for use of electricity under the laws governing EGAT, the laws governing the MEA, or the laws governing the PEA, whichever is the case.

Section 43 : The Fund Committee, with the approval of the National Energy Policy Council, shall prescribe the rates of the surcharges for the use of electricity.

In prescribing the surcharge rates for the use of electricity under Clause one hereof, consideration shall be given to the differences between the rates payable to EGAT, MEA or PEA by the designated factory or designated building and total inclusive cost of production and distribution in providing such quantities of electricity to the designated factory or designated building. The total inclusive cost under Clause two hereof means the cost of power production and distribution systems, the cost in procuring fuels for power generation, maintenance cost, administrative cost, the cost of power loss in the system, and other miscellaneous costs in the electricity operations, as well as the cost of impacts on the environment or on the general public which arise from production and distribution of such electricity which have not been directly incurred by EGAT, MEA, or PEA.

Section 44 : In the event that the surcharge for the use of electricity under Section 42 must be collected, the Director General shall inform the owner of the designated factory or designated building who must pay for such surcharge in writing, and the obligation to make

payments for such surcharge shall take effect on the first day of the following month, counting from the date of being informed by the Director General.

EGAT, MEA, or PEA each shall collect payment for the surcharge for use of electricity from the designated factories on designated buildings that bought or acquired electricity from them, together with monthly payments for regular use of electricity, and deliver to the Fund within thirty days after the dates of receipt of the surcharges.

Section 45 : During the period when the designated factory and designated building must remit payment for the surcharges for use of electricity under this Division, the Fund Committee, as it deems appropriate, may consider termination of the right to request for promotion and assistance of that designated factory or designated building temporarily, or may reduce the promotion or assistance temporarily, in the case that such designated factory or designated building has already been granted promotion and assistance.

Section 46 : After the designated factory or designated building, which must remit payment for the surcharge for use of electricity, has already complied with the Ministerial Regulations issued under Section 9 or Section 19, it shall inform the Director General accordingly.

Upon being informed under Clause one hereof, the Director General shall review within thirty days, whether or not such designated factory or designated building has complied with the Ministerial Regulations issued under Section 9 or Section 19. In the event of compliance, the Director General shall issue an order terminating collection of such surcharge for use of electricity and shall inform the designated factory or designated building in writing accordingly.

Termination of collection of surcharges shall take effect as of the first day of the following month.

DIVISION 7
COMPETENT OFFICERS

Section 47 : In the execution of this Act, the competent officer shall have the power to:

(1) Issue a written notice to the owner of the designated factory or designated building asking him to furnish statements of facts in person, or to submit written explanation, or to furnish any document or evidence, for the competent officer to inspect or consider.

(2) To enter upon a designated factory or designated building between sunrise and sunset or during working hours of such place for the purpose of inspection or execution of this Act. In this case, he shall have the power to make enquiries about or inspect the records on conditions of the factory, building, machinery and equipment, and other matters related to energy conservation in the factory and building, including the execution of work of any person in such place. He shall also have the authority to inspect the machinery and equipment or take as samples reasonable quantities of materials for tests.

Section 48 : The owner of the designated factory or designated building as well as other persons concerned shall accord facility to the competent officer who is executing his duties under Section 47(2)

Section 49 : In the execution of this Act, the competent officer shall present his I.D. Card to the persons concerned.

The I.D. Card of the competent officer shall be in accordance with the form prescribed in the Ministerial Regulations

DIVISION 8
APPEALS

Section 50 : The person who has been informed in writing, of the decision under Section 8, Clause three, who does not consent to the decision, may appeal to the Minister within thirty days of the date of being informed.

In this case, the Energy Development and Promotion Department shall suspend any action until the Minister has made a decision and the appellant has already been informed of such decision.

Section 51 : The person who has received a notice under Section 44, Clause one, who does not consent to the decision, may appeal to the minister within thirty days of the date of having been informed.

The appeal shall not be the cause to suspend lawful enforcement, except when the Minister deems appropriate to suspend lawful enforcement temporarily.

Section 52 : The Minister shall take prompt actions on the proceedings of the appeal under Section 50 and Section 51.

The decision of the Minister shall be treated as final.

DIVISION 9
PUNISHMENT

Section 53 : The owner of any designated factory who furnishes false information or false reasons under Section 8, Clause Three, shall be punished with imprisonment of not exceeding three months and a fine of not exceeding one hundred and fifty thousand Baht, or both.

Section 54 : Any owner of a designated factory who fails to comply with the instruction of the Director General under Section 10, or any owner of the designated building who fails to comply with the instruction of the Director General under Section 10, which applies mutatis mutandis under Section 21, shall be punished with a fine of not exceeding fifty thousand Baht.

Section 55 : Any owner of the designated factory who fails to comply with Section 11(1) and any owner of the designated building who fails to comply with Section 11(1) which applies mutatis mutandis under Section 22, shall be punished with a fine of not exceeding two hundred thousand Baht.

Section 56 : Any owner of a designated factory who fails to comply with Section 11(2), 11(3), 11(4), or 11(5), or section 15 or any owner of the designated building who fails to comply with Section 11(2), 11(3), 11(4), or 11(5) or Section 15 which applies mutatis shall be punished with a fine of not exceeding one hundred thousand Baht.

Section 57 : Any owner of a designated factory who has verified evidence of energy conservation work under Section 13(1) or 13(2), which is false, or any owner of a designated building who has verified evidence of work in energy conservation under Section 13(1) or 13(2), which applies mutatis mutandis under Section 22, which is false; or any person responsible for energy aspects of the designated factory, who has verified information under section 14(3), 14(4), or 14(6), which is false; or any person responsible for energy aspects of a designated building who has verified information under Section 13(3), 13(4), or 13(6) which applied mutatis mutandis under Section 22, which is false; shall be punished with imprisonment of not exceeding one month, or a fine of not exceeding fifty thousand Baht, or both.

Section 58 : Any person who fails to send contributions to the Fund, or sends less than the full amount of contributions to the Fund, under Section 35, Section 36, or Section 37, shall be punished with imprisonment of three months to two years, or a fine of one hundred thousand Baht to ten million Baht, or both.

Section 59 : Whoever obstructs or fails to accord facility to the competent officer in the execution of his duties under Section 47(2) shall be punished with a fine of not exceeding five thousand Baht.

Section 60 : In the event that the person who has committed an offence and shall be punished under this Act is a juristic person, the director or manager of such juristic person, or a person responsible for carrying out the business of such juristic person, shall also be punished likewise, unless he can prove that he has not part in committing such an offence.

Section 61 : For any offence under this Act, the Committee appointed by the Minister to settle the case, consisting of three law experts chosen from among government officials, shall have the power to settle the case. When the offender has paid the fine for the amount to be settles, within the limit of time determined by the Committee, the case shall be considered settled under the Criminal Procedure Code.

During the inquiry, if the inquiry officials finds that any person commits an offence under this Act, and such person consents to settle the case, the inquiry official shall refer the case to the Committee under Clause one hereof, within seven days counting from the date such person has shown consent

to settle the case.

Countersigned by
Mr. Anand Panyarachun
Prime Minister