

4. 実施協議調査帰国報告会資料及び協議議事録 (M / M)

# タイ国家計量標準機関プロジェクト

## フェーズ1

### 実施協議調査

### 帰国報告会資料

平成14(2002)年9月19日

国際協力事業団  
鉦工業開発協力部  
鉦工業開発協力第一課

## 第1 実施協議調査団派遣の経緯

タイ政府は、タイ産業の輸出競争力強化のために、タイ国内において国家標準を整備し、国際的同等性を確保した計量標準の体系を確立しようとしている。タイには国家標準の一元的な整備・維持・供給システムがなく、一部の大企業は校正を海外に依頼しているために高コスト・手続遅延といった問題が生じており、タイ産業の輸出力強化の阻害要因となっている。一方、世界的にはメートル条約加盟国が、99年10月の国際度量衡総会(CGPM)において「計量標準の国際比較結果と加盟国の国家計量機関が発行する証明書」に関する相互承認協定(グローバルMRA)に署名した。タイはメートル条約加盟国として、本協定の締結、及びその発効後の活動をにらみ、97年8月に国家計量制度整備法を制定するとともに、98年6月に国家計量標準機関(National Institute of Metrology (Thailand) = NIMT)を設立するなど、タイ国内の計量標準基盤整備に着手した。

このようなタイ政府の動きに対し、日本政府はNIMTの新建屋建設・機材整備を目的として国際協力銀行(JBIC)を通じて有償資金協力を行うべく、99年5月に国家計量基盤整備マスタープランが閣議了解され、NIMTの整備計画が了承された。上記有償資金協力に関し、タイ政府は、円借款による供与機材を用いた国家標準を維持・供給するためのNIMT技術者の育成を目的として、99年プロジェクト方式技術協力を要請してきた。これを受けて、2001年3月に第1次短期調査、同年10月に第2次短期調査を実施し、プロジェクト実施体制、要請内容についての協議を行った。

しかし、プロジェクトを開始する前提条件である円借款による機材調達、新庁舎の建設が大幅に遅れ、また、NIMT所長の解任というプロジェクトの実施体制が大幅に変更される事態となったため、プロジェクトの開始を延期している。

本実施協議調査においては、第一次、第二次短期調査における日本・タイ側の協議結果を踏まえつつ、円借款による新庁舎建設の遅延を考慮し、プロジェクトを2フェーズに分けて実施することを確認する。また、本調査では、フェーズ1部分のR/Dを署名・交換し、フェーズ2への移行の要件を確認する。

## 第2 主要調査内容

1. 実施協議(R/D)の署名・交換
2. 技術移転分野の確認(円借款による機材調達状況の確認)
  - (1) プロジェクト実施体制の確認
  - (2) 新所長の任命状況
3. 新庁舎建設の契約と竣工時期の確認
4. プロジェクト実施のための詳細計画の改訂
  - (1) 計画管理諸表の改訂(PDM, TCP, PO, TSI)
  - (2) 投入計画の改訂
  - (3) 初年度の活動計画案の確認
5. プロジェクトフェーズ2への移行要件の確認

### 第3 短期調査員

氏名	担当業務	所属
高間 英俊	団長・総括	国際協力事業団 鉦工業開発協力部 鉦工業開発協力第一課 課長
瀬田 勝男	技術協力計画	独立行政法人産業技術総合研究所 国際部門 国際標準協力室長
秋元 義明	計量標準	独立行政法人産業技術総合研究所 計測標準研究部門 研究参与
新関 郁子	技術移転計画	(株) ブイ・エス・オー
尾崎 菜津子	協力企画	国際協力事業団 鉦工業開発協力部 鉦工業開発協力第一課

### 第4 調査日程

別紙 1のとおり

### 第5 調査結果

別紙 2のとおり

### 第6 今後のスケジュールについて

R/D 締結： 9月16日

プロジェクト開始： 10月16日

### 第7 添付資料

別紙 1： 調査日程

別紙 2： 調査結果

別紙 3： 主要面談者リスト

別紙 4： 調査団員報告書

別紙 5： M/M

別紙 6： R/D

## タイ国家計量標準機関プロジェクト（フェーズ1）

## 実施協議調査

## 調査日程

日順	月日	曜日	日程			備考	
			団長	技術協力計画、計量標準	技術移転計画 協力企画		
1	8月25日	日	11:00	東京発 (JL717)			
			15:15	バンコク着 調査事項確認			
2	8月26日	月	9:00	JICAタイ事務所、JBICバンコク駐在員事務所との打合せ			
			午後	NIMTとの協議（1）（R/D案の作成：実施体制の確認、計画管理諸表の改訂、投入計画の改訂、初年度の活動計画案の確認、R/D案の確認、新所長の任命状況、新庁舎建設の契約と竣工時期の確認、プロジェクトフェーズ2への移行要件の確認） NIMT主催夕食会 M/M案作成			
3	8月27日	火	午前	NIMTとの協議（2） （M/M最終確認、M/M署名・交換、R/D案最終確認）			
			午後	タイ教育用情報技術開発能力向上プロジェクトCAとの打合せ	機材の調達状況と納入機材の管理状況の確認	R/D案の外務校関係 頼	DTECの R/D案確認
4	8月28日	水	午前	プロドク案、M/M案の確認・改訂	機材の調達状況と納入機材の管理状況の確認	プロドク案、M/M案の確認・改訂	
			午後	EEI関係者との打合せ	機材の調達状況と納入機材の管理状況の確認	プロドク案、M/M案の確認・改訂	
5	8月29日	木	午前	報告書作成			
			午後	在タイ日本大使館報告 JICAタイ事務所報告	バンコク発 (瀬田：JL718: 22:30)	外務校関係後のR/D案 改訂	
6	8月30日	金	8:40	バンコク発 (JL708)			
			16:35	東京着			

別紙2 調査結果

調査項目	現状及び問題点等 (既決定事項を含む)	対処方針	協議結果
1 本調査団の目的	<p>本実施協議調査においては、第一次、第二次短期調査における日本・タイ側の協議結果を踏まえつつ、円借款による新庁舎建設の遅延を考慮し、プロジェクトを2フェーズに分けて実施することを確認する。また、本調査では、フェーズ1部分のR/Dを署名・交換し、フェーズ2への移行要件を確認する。</p>		<ul style="list-style-type: none"> <li>調査結果を確認し、M/Mとしてとりまとめ、署名・交換した。なお、R/D案も作成し確認の上、9月16日に署名・交換した。</li> </ul>
2 技術移転分野の確認	<p>ア プロジェクト範囲について</p> <ul style="list-style-type: none"> <li>第2次短期調査では、以下の条件に当てはまる分野をプロジェクト範囲と決定した。 <ul style="list-style-type: none"> <li>国家標準の設定・管理</li> <li>国家標準から参照標準への校正</li> <li>詳細については別紙3および4を参照</li> </ul> </li> <li>タイ側は、既存機材への技術移転も改めて希望している。</li> </ul> <p>イ 技術移転分野選定要件</p> <p>ア) 円借款によって調達された機材を対象として技術移転を実施する。</p> <p>イ) 現庁舎で活動が出来るものを対象とする。 大型の機材で、建設途中に機材を建屋に埋め込む必要のないものを対象とする。</p> <p>ウ) 国別特設研修を実施したカウンターパートを優先する。また、既存のカウンターパートが存在する分野を対象とする。</p> <p>ウ 選定要件にかかる現状確認</p> <p>ア) 円借款による機材調達状況の確認</p> <ul style="list-style-type: none"> <li>6月末時点での状況は確認済みである。(別添参照)</li> <li>技術移転分野別の機材の調達状況</li> </ul> <ul style="list-style-type: none"> <li>タイ分の中には、製造国の問題によって調達ができない機材が出てくる可能性がある。</li> </ul> <p>イ) カウンターパートの着任状況</p> <ul style="list-style-type: none"> <li>国別特設研修を受講したカウンターパート 2001年：5名 2002年：4名</li> <li>採用予定のカウンターパートの着任状況</li> </ul>	<ul style="list-style-type: none"> <li>左記について確認する。</li> <li>既存機材については、少なくともフェーズ1の技術移転範囲には含まれない。</li> <li>左記について確認する。</li> <li>最新の状況を確認する。</li> <li>どの分野の機材が調達されているかを確認し、技術移転の実施可能性を検討する。</li> <li>調達が不可能な機材についても確認する。</li> <li>国別特設研修を実施したカウンターパートを優先する。</li> <li>既存のカウンターパートが所属する分野を対象とする。</li> <li>今後リクルートする予定のカウンターパートが所属する予定の技術分野については、対象外とする。</li> <li>カウンターパートがリクルートされた後に、技術移転対象として考慮し、短期専門家派遣を実施する。</li> </ul>	<ul style="list-style-type: none"> <li>左記について確認し、M/M Annex 11に添付した。</li> <li>左記について確認し、M/Mに記載した。</li> <li>既に納入された機材のリストを、技術移転分野毎に整理し、M/M Annex 6に添付した。</li> <li>80品目中57品目について、契約同意が行われていることを確認した。</li> <li>タイ分のうち、日本で実際には調達可能だが、NIMTの調査不足などで調達できないものについては、技術団員が調査し、リストを作成してJBICに提出することとした。</li> <li>左記について確認し、M/Mに記載した。</li> <li>左記について確認し、M/Mに記載した。</li> <li>最新のカウンターパートのリストをM/M Annex 5に添付した。</li> </ul>

別紙2 調査結果

調査項目	現状及び問題点等（風決定事項を含む）	対応方針	協議結果
	<p>ウ 認定について</p> <ul style="list-style-type: none"> <li>・ 現庁舎において認定を行うか確認する。</li> <li>- プロジェクト1年目に、認定の実施可否についての調査のため、短期専門家を1週間弱派遣する。</li> <li>- 認定を実施する場合、TISIの了解を得る必要があるため、短期専門家がTISIと調整を行う。</li> <li>- 短期専門家の調査結果を待って、プロジェクト2年目の認定の実施を確認する。</li> </ul>	<ul style="list-style-type: none"> <li>・ 音響・振動を除く技術移転分野は、全て機材を新庁舎に移設することになっており、機材の再設定を行う必要がある。従って、できるだけ新庁舎の完成後に大幅な技術移転をすることが望まれる。</li> <li>・ 認定を実施する要件を以下のとおりとする。</li> <li>- 機材が調達された分野について認定を実施することを考慮する。</li> <li>- フェーズ2における認定の実施についても、調査の結果を確認した上で決定する。</li> </ul>	<ul style="list-style-type: none"> <li>・ 認定の実施については、プロジェクト1年目に派遣予定の短期専門家（信頼性向上）がNIMTの現状調査及びTISIとDKDとの調整を行った上で、2年目の認定実施を考慮することを確認し、その旨M/Mに記載した。</li> </ul>
(1) プロジェクト実施体制の確認	<ul style="list-style-type: none"> <li>・ 第2次短期調査においては、Project Director, Associate Project Director, Assistant Project Directorのポジションを置くとしている。</li> </ul>	<ul style="list-style-type: none"> <li>・ 左記について確認を行う。</li> <li>・ JCCのメンバーについても再確認を行う。</li> <li>・ MOSTEおよびThai Userの参加を確認する。</li> </ul>	<ul style="list-style-type: none"> <li>・ Project Director</li> <li>Associate Project Director</li> <li>Assistant Project Director</li> <li>に加えて、Project Coordinatorのポジションを置くこととし、R/Dに記載した。</li> <li>・ JCCのメンバーに、Project CoordinatorとJBICバンコク駐在員事務所の代表を加えることを確認し、R/D Annex Vに記載した。</li> </ul>
(2) 新所長の任命状況	<ul style="list-style-type: none"> <li>・ NIMTで7月29日締切で公募を実施し、3名の応募があった。</li> <li>・ 暫定所長 Bunjob氏：任期は8月中旬までだが、新所長が着任するまで延長される見込みである。</li> </ul>	<ul style="list-style-type: none"> <li>・ 現状を確認する。</li> </ul>	<ul style="list-style-type: none"> <li>・ 7月末までに応募者3名に加え、更なる応募がないか再公募を実施することを確認した。理事会による決定を経て、10月に新所長が着任する見込みであることを確認した。</li> <li>・ Bunjob氏が新所長の着任まで、引き続き暫定所長を続けることを確認した。</li> </ul>
3 新庁舎建設の契約と竣工時期の確認	<ul style="list-style-type: none"> <li>・ 契約についての決裁がMOSTE大臣に止められており、JBICがタイ大蔵省を通じて、またNIMTは司法長官を通じて申し入れを行っている。</li> </ul>	<ul style="list-style-type: none"> <li>・ 最新の状況について確認する。</li> </ul>	<ul style="list-style-type: none"> <li>・ 8月上旬に新庁舎建設の契約を承認し、9月上旬には契約を行える見込みであることを確認した。</li> </ul>
4 プロジェクト実施のための詳細計画の改訂	<p>ア 計画管理諸表の改訂</p> <ul style="list-style-type: none"> <li>・ PDM、TCP、PO、TSIを第2次短期調査の際に作成した。</li> </ul> <p>イ 投入計画の改訂</p> <ul style="list-style-type: none"> <li>・ 第2次短期調査の際に投入計画を確認した。</li> </ul> <p>ア) 長期専門家</p> <ul style="list-style-type: none"> <li>・ チーフアドバイザー</li> <li>・ 業務調整</li> <li>・ 電磁気標準</li> <li>・ 物理標準</li> </ul> <p>イ) 短期専門家</p> <p>ウ) カウンターパート研修</p> <p>ウ 初年度の活動計画案の確認</p> <ul style="list-style-type: none"> <li>・ 第2次短期調査において、活動計画案を確認した。</li> </ul>	<ul style="list-style-type: none"> <li>・ プロジェクトフェーズ1用に改訂を行う。</li> <li>・ フェーズ1実施にかかる変更点を確認する。</li> <li>・ 別紙3のとおり。</li> <li>・ 別紙3のとおり。</li> <li>・ フェーズ1実施にかかる変更点を確認する。</li> </ul>	<ul style="list-style-type: none"> <li>・ 計画管理諸表を改訂し、R/Dに添付した。</li> <li>・ 投入計画を改訂し、R/Dに記載した。主な変更点は以下のとおり。</li> <li>- 長期専門家 4名 R/D Annex11 参照</li> <li>- 短期専門家（初年度 10名） Attachment 7</li> <li>- カウンターパート研修 個別特設研修を実施</li> </ul>

別紙2 調査結果

調査項目	現状及び問題点等（既決定事項を含む）	対応方針	協議結果
<p>5 プロジェクト・フェーズ2への移行要件について</p> <p>1) フェーズ2の開始要件</p>	<p>エ プロジェクト開始日について</p> <ul style="list-style-type: none"> <li>・ プロジェクト期間：2002年10月1日～2004年9月30日</li> <li>・ R/D締結後、1ヶ月後を開始の日処とする。</li> </ul> <p>当初は、プロジェクト期間を5年間で設定していたが、円借款による新庁舎の建設、機材調達の遅れに伴い、プロジェクト期間を変更することとする。</p> <p>新庁舎完成を目処に開始することとする。</p>	<ul style="list-style-type: none"> <li>・ 左記について確認する。</li> </ul> <p>プロジェクトを2フェーズに分けることとする。</p> <p>フェーズ1：2年間 フェーズ2：2～3年間</p> <p>新庁舎の建設途中に機材掘付に立ち会う必要があれば、新庁舎完成直前のプロジェクト開始も考慮する。</p>	<ul style="list-style-type: none"> <li>・ プロジェクト期間 2002年10月16日～2004年10月15日</li> </ul> <p>左記について確認し、タイ側の了解を得た。</p> <p>左記について確認し、M/Mに記載した。</p>
<p>2) 新庁舎の建設状況</p>	<p>契約についての決裁が、MOSTE大臣に止められている。現在、JBICが大蔵省を通じて、又タイ国家計画標準機関（NIMT）は司法長官を通じて申し入れを行うなど、事態は改善しつつある。</p>	<ul style="list-style-type: none"> <li>・ 最新情報を確認する。</li> <li>・ 当方も契約手続きの促進について申し入れを行う。</li> </ul>	<ul style="list-style-type: none"> <li>・ 上記のとおり、8月上旬にMOSTE大臣が決裁し、9月には契約締結の見込みであることを確認した。</li> </ul>
<p>6 ローカルコスト負担</p>	<p>2003年9月の竣工というスケジュールは大幅に遅れている。</p> <p>第2次短期調査において、予算の配分状況を確認した。</p>	<ul style="list-style-type: none"> <li>・ 最新情報を確認する。</li> <li>・ NIMT側にローカルコスト負担の状況について確認する。</li> </ul>	<ul style="list-style-type: none"> <li>・ 9月中に着工し、16ヶ月後が竣工予定であることを確認した。</li> <li>・ 予算状況について再度確認し、NIMT側が必要なローカルコスト負担を行うことを確認した。</li> </ul>



## 主要面談者リスト

### タイ側

(NIMT)

- |   |                                |   |
|---|--------------------------------|---|
| 1 | Mr. Bunjob Suktat              | Deputy Director   |
| 2 | Mr. Somsak Charkkian           | Assistant Director  |
| 3 | Mr. Veera Tulasombut           | Head, Mechanical Metrology Dept.  |
| 4 | Ms. Ajchara Charoensook        | Head, Dept. of International Relations and<br>Dept. of Electrical Metrology |
| 5 | Mr. Prawet Maharattanasakul    | Manager, Administration Dept.   |
| 6 | Flt. Lt. Tawat Changpan        | Assistant Head, Dept. of Mechanical Metrology                               |
| 7 | Mr. Chusak Chausai             | Project Manager   |
| 8 | Ms. Nattanit Pongjeerakumchorn | Head, International Relations Section                                       |

### 日本側

(在タイ日本国大使館)

- |   |       |       |
|---|-------|-------|
| 1 | 山澄 克氏 | 二等書記官 |
|---|-------|-------|

(国際協力銀行 バンコク駐在員事務所)

- |   |        |     |
|---|--------|-----|
| 1 | 齋藤 法雄氏 | 駐在員 |
|---|--------|-----|

(JICA タイ事務所)

- |   |         |
|---|---------|
| 1 | 中井 信也所長 |
| 2 | 高島 宏明次長 |
| 3 | 澁谷 晃 職員 |

団長所感

高間 英俊

プロジェクトの開始の条件としては、円借による機材供与の見通し（必要機材が納入されること）と NMIT の実施体制が確立されていることが確認することである。建物に関しては、できれば、早期に契約・着工の運びになれば良いと考えていた。

円借による機材供与に関しては、関係者の努力により、ほとんど問題なく納入できそうな状況である（納入時期については、今の段階では不明）。

NMIT の実施体制に関しては、新所長は空席のままであるが、副所長以下の実行部隊に期待したい。新所長の任命には今しばらく時間が掛かると思われる。

建物の契約・着工に関しては、9月終わりから10月はじめにも工事開始の予定であると聞いている。この予定でいけば、2004年の1月末に竣工である。

従って、こういう状況で、プロジェクトは実施できると確信する。

実施の段階では、次のような点を留意する必要がある。

1. タイの組織では、トップダウンが一般的であるが、トップが良ければよいがそうでない場合もある。なるべく、トップの所長だけでなく、その部下にも会議に出席させるなどして、集団的コンセンサスを得ることが必要である。
2. 上級官庁である MOSTE に対しても、風通しを良くする。R/D のサイナーに MOSTE の次官補を加えた。
3. JCC には、ユーザーも入れたので、工業会などの民間とのつながりや連携を強化する。
4. TISI との連携を強化して、国のシステムとしてキャパシティを作り上げる。
5. 第三国研修（特にカンボジア、ラオス、ミャンマー）は、2年度以降に考慮する。
6. Phase 2 への移行は、間断なく行われることを期待する。

2002 年 8 月 25～30 日のタイ国計量研究所 (NIMT) の訪問において、上記の機材整備状況について調査を行った。既に下記に示すように計 60 件の機材が NIMT に納入されている。調達状況については、別途、秋元の報告書に述べる。

### 1. 整備された機材の概要

NIMT において、計量標準の整備と、それをを用いた国内への校正サービスに使用する機器群がこの円借款で購入されている。

分野別には	音響・振動	14 件
	電気・磁気	27 件
	長さ・幾何	3 件
	質量・関連量	5 件
	物質量・標準物質	3 件
	温度・湿度	7 件
	時間・周波数	1 件

ただしここで件数で記述したのは購入時におけるまとまりを件で表したもので、必ずしも装置の台数と一致している訳ではなく、また、件毎にその大きさも異なる。例えば、一つの機能を有する装置を個々のデバイスに分類して複数の件数となっているものもあれば、全体を 1 件としているものもある。

### 2. 機材の全体的な状況

リストにある機器は全て確認できた。納入時に故障が発見され、現在メーカーに一部を返送して修理待ちのもの 1 件を除けば特に問題なく保存・あるいは使用されている。現在ほぼ半数の機器は既に稼働状態にあり、残りの半数は納入時の検収後は NIMT の当該部署で保管されている。保管の状況は全体としては順当なものであり、機器の性能低下が危惧されるような問題は特に見あたらない。その意味では特に指摘すべき保管上の問題は無い。

### 3. 改善が望まれる事項

#### 3. 1 リストの変更

上記で述べたように機材リストは納入用に整備されており、使用段階に移行した機器の検査には不適當である。納品後の適当な時点で機器管理用のリストを使用状況に合わせたものとして整備することが望ましい。

#### 3. 2 分野別の多寡について

上記のリストにあるように、現在電気関係が特に納入された機器が多い。(音響振動も多く見えるが、細かいデバイス等があるため実際の総量はそう多くない) このため、人員・建物の容量に比べて多すぎる状態となっており、今後使用されるにしても現在は手つかずの機器が少なくなかった。これに比べて質量関連量や長さでは機器の量が少なく、人的・空間的には余裕が感じられた。これ自体は整備状況というよりは機材の選択と納入時期の問題であるが、納入された機材の保管状況を悪くする懸念もあり、調達における調整が必要と思われる。

## 機材調達状況

標準機器整備は当該プロジェクトと強くリンクしており、開始条件を左右する課題である。よって、今次の調査団では機材調達状況の調査と課題の整理・調整を行った。

JBIC第24次円借款(Phase1)の予算で購入を予定している標準機器の調達は、概ね順調と言えるが、次の点で多少問題がある。

1. タイド化条件下の標準機器は、調達事務が開始されていない案件が24件ある。

この原因としては、

- (1) 調達のプロセスにおいて価格調整に時間を費やし過ぎたこと。
- (2) 購入予定の標準機器には、本社が東京にあるにも関わらず米国工場で生産しているため、タイド条件(原産国条件)を満たすことができないために調達が遅れている。
- (3) 標準機器を個別に契約を進めるべく分散購入計画を立案したため、タイド条件を満たすことができず調達が遅れている。

2. アンタイト条件下の標準機器は、第1回の入札で落札業者が決定し、JICA(第2次調査)の要請により先行発注ができたこともあり順調に調達が進んでするものの、契約に達していない案件が3件ある。

この原因としては、

- (1) アンタイト条件下の標準機器には、タイド条件を満たすために調達準備が進まず整備計画に変更を強いられている機器もある。具体的には、力標準機のような大型標準機器の価格調整・選定に時間を費やしたためである。

これらの問題を改善するために今次の調査団では次のことを行った。

1. NIMTにおける大型標準機器の課題を和らげることも含め、技術移転項目の当初目標を一部変更し、力標準の技術移転を前倒にして実施すべく計画変更を行った。
2. 調達準備が遅れている標準機器については、1件毎にコメントを含め詳細に調整した。
3. NIMTに搬入済みの標準機器については管理状況を把握した。

結論としては、当該プロジェクトを開始するための一条件としての、標準機器整備条件は満たされていることが分かり、調達が遅れている標準機器については早期調達の目処を得た。今後の課題としては、調達方法、調達時の技術的支援をNIMT及びJBICと調整していくべきことが掲げられる。

秋元

2002年9月5日

## タイ国家計量標準機関プロジェクトフェーズ1実施協議調査報告書

新聞 郁子（技術移転計画）

### 1. プロジェクト管理諸表の確認

第24次円借款による納入済みの機材、併せて短期専門家派遣の可能性に従い、プロジェクト管理諸表の確認・改訂をNIMT側と共に行った。その結果、マスタープランであるプロジェクト・デザイン・マトリックス（PDM）、および活動計画（PO）、年間活動計画（APO）、暫定実行計画（TSI）、年間暫定実行計画（ATSI）は変更がなかった。技術協力計画（TCP）は、2003年度Fixed Pointを技術移転量目からはずし、代わりにForce Standardを追加した。年間技術協力計画(ATCP)については、2002年度Time and Frequencyの短期専門家派遣はしないこととし、NIMT側の了解を得た。

これらの管理諸表は、R/DのAttachmentとして添付した。

### 2. プロジェクト・ドキュメントの作成

上記管理諸表の改訂に伴い、予め用意していたプロジェクト・ドキュメントの該当箇所の改訂を行った。主な改訂点は、本文中では、技術移転分野を6分野（1 音響・振動、2 電気・磁気、3 時間・周波数、4 長さ、5 質量関連量、6 測温）、16量目（1 音響、2 パワー、3 直流高電圧、4 RF減衰、5 RFパワー、6 RF電圧、7 時間・周波数、8 波長、9 プラグ・リング、10 真円度、11 粗さ、12 角度、13 力、14 硬さ、15 湿度、16 放射温度）と確定した。また、プロジェクトの実施体制にNIMT側Project Coordinatorを追加した。Annexに関しては、NIMTの予算計画に変更はない旨確認し、また、最新のカウンターパートリストをNIMTから入手し添付した。2002年8月現在のリストによると、2001年11月時と比較し、既に離職したカウンターパートが数名いるものの全体として16名増員されている。

このプロジェクト・ドキュメントはNIMTに手渡し、後日NIMT側で確認した後JICAタイ事務所宛連絡するよう指示してきた。

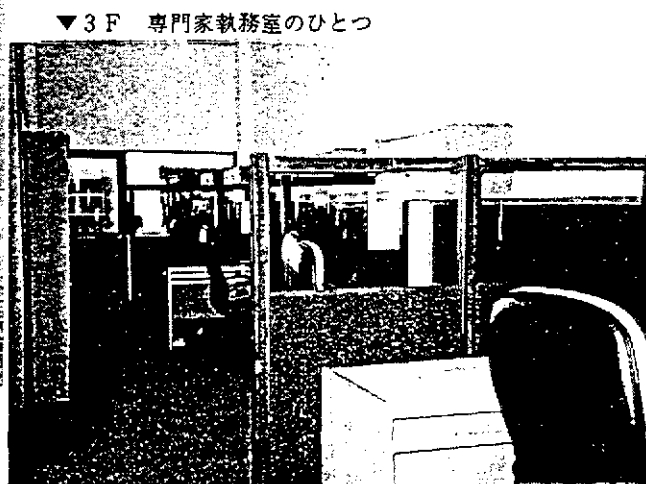
### 3. 専門家執務室の整備状況

NIMT ビル内の専門家執務室の整備状況は良好であった。現庁舎の一角にプロジェクトのために用意された専門家室には、執務用机・椅子、会議用テーブル・椅子が専門家の数に合わせて所定の位置に配置されていた。2F には、デスクトップ型パソコン1台がプリンターに接続されており、他に FAX1台、金庫が備えられ、また通路には冷蔵庫が置かれていた。3F には、電話機4台、FAX1台、プリンター1台、さらに応接用テーブル・ソファー、新聞ラックが用意されていた。また、コピー機、テレビについても近く納入予定の旨であった。

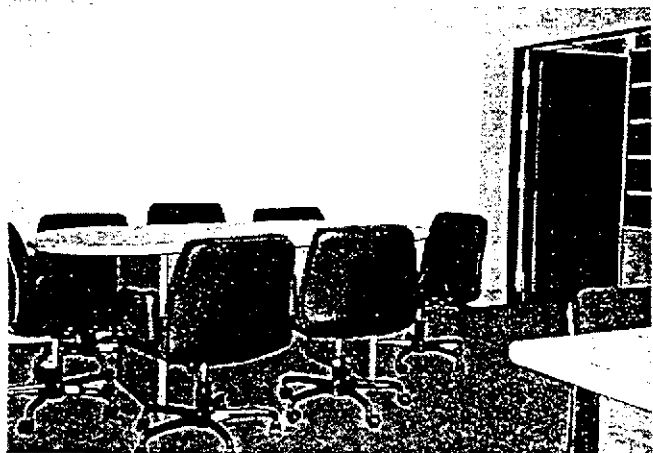
これらの事務機器・備品は、昨年 11 月の第 2 次短期調査の際に NIMT 側に要望として挙げていたもので、現時点で日本側の要望通りほとんど準備が整っていることが確認された。専門家の着任後スムーズに業務を開始するための基盤となる。



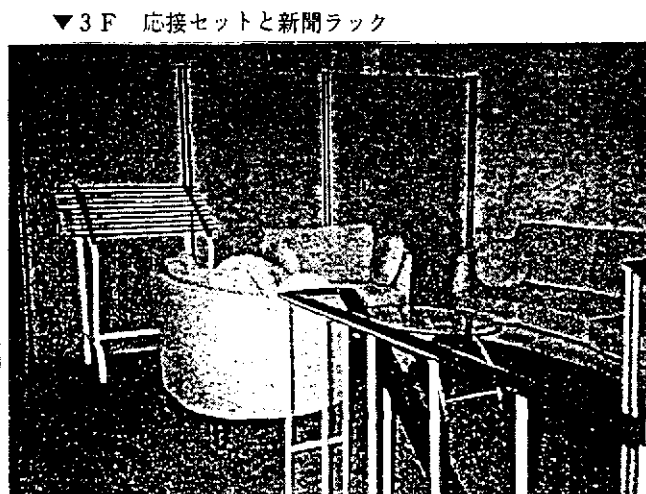
▲ 2F 新品のパソコンと FAX



▼ 3F 専門家執務室のひとつ



▲ 3F ミーティング用テーブル・椅子  
専門家執務室入口に続く



▼ 3F 応接セットと新聞ラック

**THE MINUTES OF MEETING  
BETWEEN THE PROJECT DESIGN TEAM  
AND  
THE THAI AUTHORITIES CONCERNED OF THE GOVERNMENT OF  
THE KINGDOM OF THAILAND  
ON  
JAPANESE TECHNICAL COOPERATION FOR THE PROJECT ON  
TECHNICAL STRENGTHENING OF NATIONAL INSTITUTE OF  
METROLOGY (THAILAND) PHASE 1**

The Project Design Team (hereinafter referred to as "the Team") organized by Japan International Cooperation Agency (hereinafter referred to as "JICA"), headed by Mr. Hidetoshi Takama, visited the Kingdom of Thailand from August 25 to August 30.

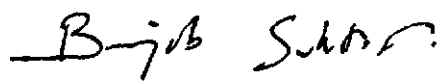
The purpose of the visit is to prepare the Japanese Technical Cooperation Project for Technical Strengthening of National Institute of Metrology (Thailand) Phase 1 (hereinafter referred to as "the Project").

During its stay in the Kingdom of Thailand (hereinafter referred to as "Thailand"), the Team exchanged views and had a series of discussions with the management team headed by Mr. Bunjob Suktat of National Institute of Metrology (Thailand) (hereinafter referred to as "NIMT"), Ministry of Science, Technology and Environment, the Kingdom of Thailand.

As the result of the discussions, both sides came to reach a common understanding. The details of their understanding are referred to the document attached hereto.

Bangkok, August 27, 2002

  
\_\_\_\_\_  
Mr. Hidetoshi Takama  
Leader  
Project Design Team  
Japan International Cooperation Agency  
Japan

  
\_\_\_\_\_  
Mr. Bunjob Suktat  
Acting Director  
National Institute of Metrology (Thailand)  
Ministry of Science, Technology and  
Environment  
The Kingdom of Thailand

## ATTACHED DOCUMENT

### I SPECIFIC ITEMS REGARDING THE PROJECT

#### 1 Items of Technical Transfer: (Annex 1: Provisional Image of the Project)

Both Thai side and Japanese side agreed that the items of technical transfer were as the followings;

- 1) *Establishing and maintaining National Measurement Standards (Initial setting up will be included in the procurement specification of the equipment.)*
- 2) Establishing calibration technology and calibration procedure of National Measurement Standards and Reference Standards

#### 2 The Scope of the Technology Transfer in the Project (Annex 2)

Both Thai side and Japanese side agreed that the measurement quantities for technology transfer are listed in Annex 2. Conditions for selecting the measurement quantities of technology transfer to be implemented in the Project are the followings;

- 1) Equipment for the target measurement quantities should have already been procured by ODA Loan and delivered to NIMT.
- 2) Technology transfer in target measurement quantities should be possible in existed building. (e.g., fields not required for built-in equipment)
- 3) Counterpart personnel in target fields have been already employed and engaged in NIMT. Particularly, fields in which counterpart personnel have already received country-focused training in Japan will be prioritized.

#### 3 Monitoring and Evaluation Plan (Annex 3)

Both Thai side and Japanese side agreed that monitoring and evaluation should be implemented according to the above plan. After starting the Project, Japanese experts and counterpart personnel should collaborate to compose the evaluation sheet to identify the achievement level of technology transfer by counterpart personnel.

### II MEASURES TO BE TAKEN BY THAI SIDE

#### 1 Local Cost (Annex 4: Budget Allocated to NIMT)

Both Thai side and Japanese side confirmed that spare parts and consumables should be also borne by the Thai side, according to the rule of JICA's projects. Both sides also confirmed that local cost for the administration of the Project should be borne by Thai side.


#### 2 List of the Counterpart Personnel and Administrative Personnel: Annex 5

Both Thai side and Japanese side confirmed that counterpart personnel in the above list are now employed and engaged in NIMT.

### III CURRENT SITUATION OF CONDITIONS FOR SELECTING FIELDS OF TECHNOLOGY TRANSFER

#### 1 Current Situation of Procurement of Equipment by ODA Loan

Both Thai side and Japanese side confirmed that equipment in the following list have already delivered to NIMT. (Annex 6: List of Delivered Equipment by ODA Loan) Both sides also clarified that Thai side will make best effort to procure the rest of equipment currently not yet





delivered to NIMT.

## 2 Accreditation to the measurement quantities of measurements

Both Thai side and Japanese side agreed that the grant of accreditation in second year of the Project should be decided after the fact-finding by the dispatched expert of improving the confidence of National Measurement Standards in first year of the Project. The experts will also coordinate with TISI and DKD to identify the required conditions for the grant of accreditation to NIMT.

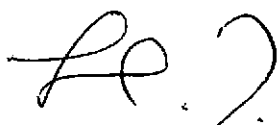
## IV COMMENCEMENT OF THE PROJECT

The Project will be started after one month of signing Record of Discussion.

## V CONDITIONS FOR TRANSITION TO PHASE 2

Both Thai side and Japanese side agreed that the duration of Phase 2 would be 2 or 3 years and it will be started after completing the construction of the new building.

Both sides confirmed that both sides would make best effort for the continuous transition to Phase 2, when the construction of the new building will be completed before the end of the Project.



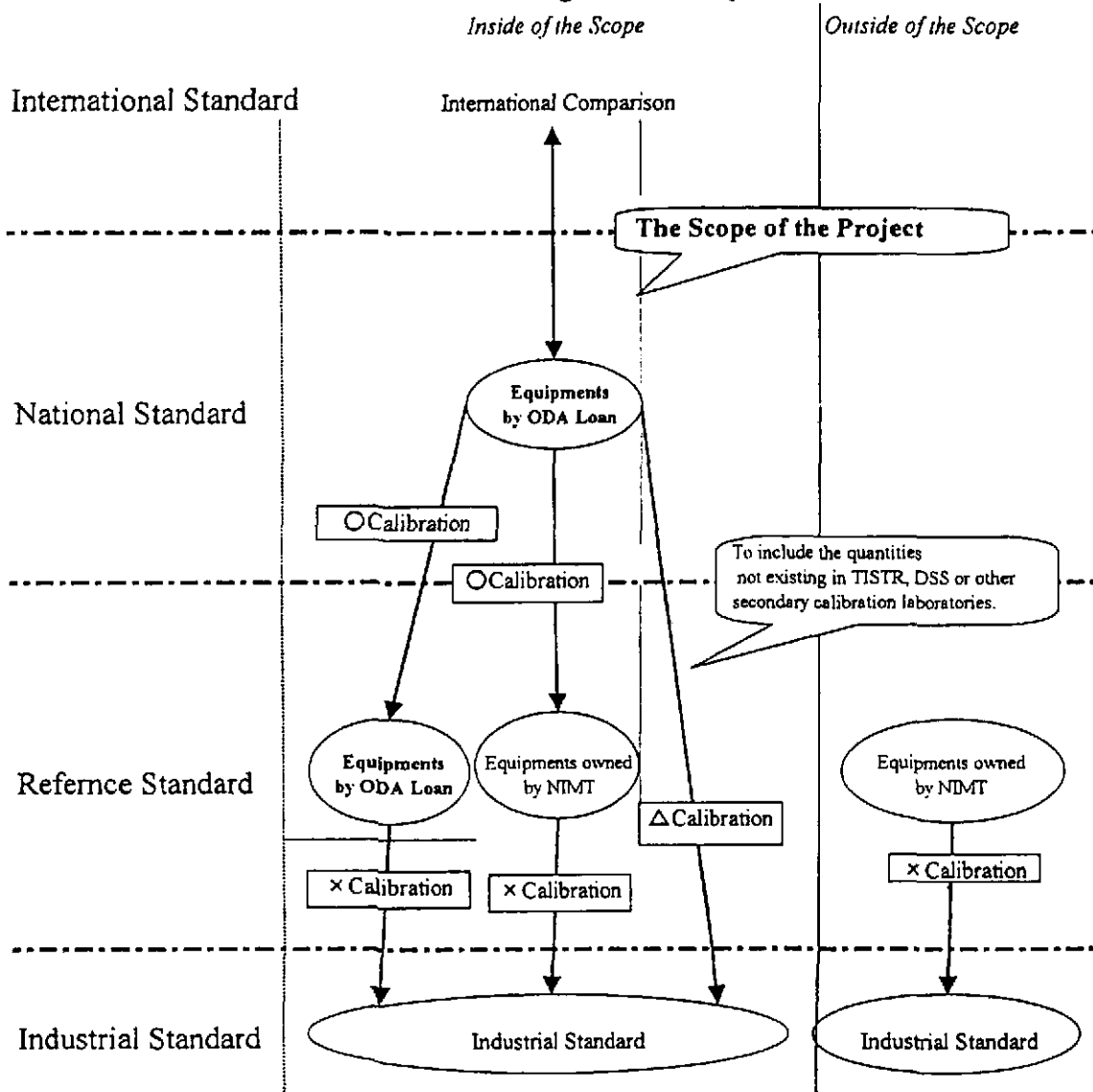
## LIST OF THE ANNEXES

- Annex 1: Provisional Image of the Project
- Annex 2: The Scope of the Technology Transfer in the Project
- Annex 3: Monitoring and Evaluation Plan
- Annex 4: Budget Allocated to NIMT
- Annex 5: List of the Counterpart Personnel and Administrative Personnel
- Annex 6: List of Delivered Equipment by ODA Loan.

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### Provisional Image of the Project



○ Calibration Technology should be included in the scope of the project.

△ Calibration Technology should consider whether included or not included in the scope of the project.

× Calibration technology should not be included in the scope of the project.

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By 9.

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Scope of the Project

PHASE I

as of 26.Aug.02

Scope	Quantity	2001 FY		2002 FY		2003 FY	
		Training	Dispatch	Training	Dispatch	Training	Dispatch
1 Acoustic & Vibration	Acoustics			Acoustics	Acoustics		
	Vibration	Vibration	Vibration				
2 AC Related Standard	Power					Power	Power
3 High Voltage	DC HV					DC HV	
7 RF Standard	RF Attenuation					RF Attenuation	
	RF Power					RF Power	
	RF Voltage					RF Voltage	
9 Time and Frequency	Time/Freq			Time/Freq			
11 Length standard	Wavelength			Wavelength	Wavelength		Accreditation
12 Form	Plug/Ring			Plug/Ring	Plug/Ring		
	Roundness			Roundness	Roundness		
	Roughness			Roughness	Roughness		
15 Angle	Angle					Angle	Angle
17 Force Standard						Force	
21 Hardness	Hardness			Hardness	Hardness		
25 Thermometry	Humidity						Humidity
	Radiation				Radiation		Accreditation
Environment Management							(1)*
Calibration Procedure					1		1
Confidence of NMS					2		1

\* The expert will be dispatched, when the construction work of new building will be almost completed.

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### Monitoring and Evaluation Plan (Draft)

Name of the Project	Project for Technical Strengthening of National Institute of Metrology (Thailand)		
Duration of Cooperation	Two (2) years from October 2002		
Study Team			
Period of the Study			
Division in Charge	First Technical Cooperation Division, Mining & Industrial Development Cooperation Department	Staff in Charge	

#### I Activities and Contents of the Project

The activities and contents of the Project are shown in the following Charts for Project Planning and Management:

**1 Project Design Matrix (PDM)**

Project Design Matrix for the Project was formulated by the Implementation Study Team in consultation with the Thai side.

**2 Plan of Operations (PO)**

Plan of Operations for the Project was formulated by the Implementation Study Team in consultation with the Thai side.

**3 Annual Plan of Operations (APO)**

Annual Plan of Operations for the Project was formulated by the Implementation Study Team in consultation with the Thai side.

**4 Technical Cooperation Program (TCP)**

Technical Cooperation Program for the Project was formulated by the Implementation Study Team in consultation with the Thai side.

**5 Annual Technical Cooperation Program (ATCP)**

Annual Technical Cooperation Program for the Project was formulated by the Implementation Study Team in consultation with the Thai side.

#### II Monitoring and Evaluation System

**1 Monitoring**

The following monitoring is scheduled to be held during the cooperation period:

**(1) Periodical Monitoring**

The periodical monitoring is to be implemented, the contents of which are to be discussed on the occasion of regular meetings in the Project, such as Weekly Technical Meeting to be implemented by Long-term technical experts and the Thai technical C/P including the Technical Coordinator and Weekly, Monthly and Quarterly Project Management Meeting to be implemented by Chief Advisor, Project Coordinator, Long-term experts as well as Project Manager, Thai Project Coordinator and Technical Coordinator.

**(2) Monitoring**

Monitoring will be done every six (6) months by the Project. The results will be presented to the Joint Coordinating Committee (JCC) and distributed to the organizations concerned and/or personnel involved in the Project.

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*B. J. S.*

Annex 3

**2 Evaluation**  
 Evaluation of the Project will be conducted jointly by the two Governments through JICA and the Thai authorities concerned (in the middle and) during last six (6) months of the cooperation term in order to examine the level of achievement as stipulated in the R/D.  
 JICA will dispatch the final evaluation team and also the mid-term evaluation team. In any manner, any evaluation should be jointly implemented by both sides and the outcome should be submitted and reported at the JCC in the form of Joint Evaluation Report and are to be signed by both sides, if possible.

**III Tentative Schedule for Monitoring and Evaluation**

Date	Monitoring or/ Evaluation and other related activities	Implementator	Reporting
August 2002	Signing of the R/D	JICA Thailand Office The Thai side	R/D, M/M, Project Document
March 2003	Monitoring (1)	Japanese experts The Thai C/P  to be confirmed by JCC members	M/D at JCC, Monitoring Report
September 2003	Monitoring (2)	Japanese experts The Thai C/P  to be confirmed by (Advisory Team and) JCC members	M/D at JCC, Monitoring Report
March 2004	The Final Evaluation	Japanese experts The Thai C/P  to be confirmed by Evaluation Team and JCC members	Final Evaluation Report, M/D at JCC, Monitoring Report
September 2004	Final Monitoring (3)	Japanese experts The Thai C/P  to be confirmed by JCC members	M/D at JCC, Monitoring Report
	Completion of the Cooperation		

**IV Criteria and Item for Monitoring and Evaluation**

**1 Criteria and Item for Monitoring**  
 (1) PDM (Project Design Matrix)  
 (2) PO (Plan of Operations) and APO (Annual Plan of Operations)  
 (3) TCP (Technical Cooperation Program) and ATCP (Annual Technical Cooperation Program)  
 (4) Evaluation Sheet of Technology Transfer  
 (5) Monitoring Sheet of Technical Cooperation  
 (6) Others if necessary

If technology transfer does not progress as planned, the Project will study the interior/exterior factors to hamper, take necessary countermeasures and will revise the plan.  
 The above mentioned charts will be confirmed on the occasion of the first monitoring scheduled in March 2003.

**2 Criteria and Item for Evaluation**  
 Criteria and Item for Evaluation will be prepared by the Project based on the Evaluation Grid and also be confirmed on the occasion of the first monitoring scheduled in March 2003.

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# Annex 4

## Budget Allocated NIMT

(Mil. Baht)	Estimated Plan for 10 yrs Total (Table 8)	Actual Annual Budget Total	1998	1999	2000	2001 Jan-Oct	2002
<b>I. Government Budget</b>	838.69	202.04	-	-	69.97	72.06	65.48
1. Plan for Development of Core organization(NIMT)							
1.1 Construction of New NIMT Labs Building and Acquisition of National Standards							
1) JBIC Loan	1,000.00	0.00	-	-	0.00	0.00	
2) Thai Government Budget	200.00	50.20	-	-	15.00	20.03	15.17
<b>Total</b>	<b>1,200.00</b>	<b>50.20</b>	<b>-</b>	<b>-</b>	<b>15.00</b>	<b>20.03</b>	<b>15.17</b>
1.2 General Administration		0.52	-	-	0.03	0.04	0.46
<b>Total</b>	<b>27.00</b>	<b>0.52</b>	<b>-</b>	<b>-</b>	<b>0.03</b>	<b>0.04</b>	<b>0.46</b>
1.3 Engineering, Maintaining and Developing the National Standards							
1) Improvement of Lab. Environment and Building (DSS Build.)	23.45	7.10	-	-		6.00	1.10
2) Development of NIMT's Quality System	including 1) 19.20	2.51	-	-		1.32	1.20
3) Establishment of the National Standards	19.20	8.95	-	-		3.24	5.72
4) Acquisition and Maintenance of the New Measurement Standards	including 1) 47.82	-	-	-		29.79	18.03
5) Repair the Existing the National Measurement Standards	10.13	5.12	-	-		0.92	4.20
6) Participation of Interlaboratory Comparisons with other Metrology Institutes	83.30	0.76	-	-		0.58	0.38
<b>Total</b>	<b>136.08</b>	<b>111.00</b>	<b>-</b>	<b>-</b>	<b>38.73</b>	<b>41.65</b>	<b>30.62</b>
1.4 Human Resource Development		5.07	-	-	2.25	2.82	5.46
<b>Total</b>	<b>49.09</b>	<b>5.07</b>	<b>-</b>	<b>-</b>	<b>2.25</b>	<b>2.82</b>	<b>5.46</b>
1.5 Improvement of Research and Development	64.00	3.16	-	-	-	1.16	2.00
<b>Total</b>	<b>64.00</b>	<b>3.16</b>	<b>-</b>	<b>-</b>	<b>-</b>	<b>1.16</b>	<b>2.00</b>
1.6 Improvement of Information System	19.20	12.52	-	-	6.05	1.83	4.64
<b>Total</b>	<b>19.20</b>	<b>12.52</b>	<b>-</b>	<b>-</b>	<b>6.05</b>	<b>1.83</b>	<b>4.64</b>
<b>2. Plan for Development of the national Metrology System</b>							
2.1 Development of the National Metrology Network and Users	194.52	7.12	-	-	3.87	1.55	1.70
<b>Total</b>	<b>194.52</b>	<b>7.12</b>	<b>-</b>	<b>-</b>	<b>3.87</b>	<b>1.55</b>	<b>1.70</b>
2.2 Promotion of Favorable Environmental for Development of the National Metrology System	148.80	12.46	-	-	4.05	2.99	5.43
<b>Total</b>	<b>148.80</b>	<b>12.46</b>	<b>-</b>	<b>-</b>	<b>4.05</b>	<b>2.99</b>	<b>5.43</b>
<b>II. Service Revenue</b>							
1.1 Calibration Service	11.43	11.47	0.04	2.92	3.95	4.57	
1) Mass		2.71		0.85	0.97	0.89	
2) Force & Torque		0.04			0.01	0.04	
3) Pressure & Vacuum		1.45		0.27	0.59	0.59	
4) Acoustics & Vibration		0.23	0.02	0.03	0.01	0.17	
5) Length		3.23		0.86	1.07	1.30	
6) Electrical, Time & Frequency		2.17	0.03	0.50	0.65	0.99	
7) Temperature		1.64		0.41	0.66	0.57	
1.2 Training Service		4.93	-	0.49	1.60	2.84	
1.3 Consulting Service		0.29	-	-	0.19	0.11	
<b>Total</b>	<b>28.08</b>	<b>28.17</b>	<b>0.08</b>	<b>6.32</b>	<b>9.69</b>	<b>12.07</b>	
<b>III. Estimated Expenses Total based on (above I plus suraly and</b>				28.72	98.33	117.25	118.67
<b>Profit based on above II - III(Loss)</b>				N/A	▲ 22.10	▲ 88.64	▲ 105.17

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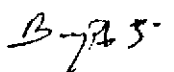
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NIMT's MAINTENANCE BUDGET 1999

PROJECT	YEAR 1999
Establishing, Maintaining and Developing the National Standards Repair and Maintenance : Miscellaneous Repair and Maintenance : Air Condition Repair and Maintenance : Building Repair and Maintenance : the Existing the National Measurement Standards Freight and Carriage	 300,000 500,000 1,000,000 924,000
<b>TOTAL</b>	<b>2,724,000</b>



ส่วนวิเคราะห์และประสานงาน สำนักผู้อำนวยการ



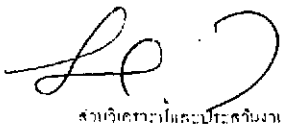
NIMT's BUDGET 1999-2001 1999



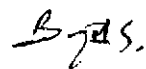
NIMT's BUDGET 2000-2001

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PLANS / PROJECTS	YEAR	
	2001	2002
<b>1. Plan for Development of Core Organization (NIMT)</b>	<b>103,621,200</b>	<b>103,510,875</b>
1.1 General Administration	36,141,300	45,618,880
1.2 Establishing, Maintaining and Developing the National Standards	41,645,700	30,621,800
Improvement of Laboratory Environment and Building	6,000,000	1,100,000
Development of NIMT's Quality System	1,315,200	1,195,000
Establishment of the National Standards	3,235,500	5,717,800
Acquisition and maintenance of the New National Measurement Standards	29,791,000	18,029,000
Repair the Existing the National Measurement Standards	924,000	4,200,000
Participation in Intertaboratory comparisons with other Metrology Institutes	360,000	380,000
1.3 Human Resource Development	2,818,700	6,460,895
1.4 Improvement of Research and Development	1,157,000	2,000,000
1.5 Improvement of Information System	1,829,000	4,640,700
1.6 Government Budget for National Metrology System Development Project (Construction of New NIMT Laboratory Building and Acquisition of the National Standards)	20,029,500	15,166,600
<b>2. Plan for Development of the National Metrology System</b>	<b>4,538,800</b>	<b>7,129,125</b>
2.1 Development of the National Metrology Network and Users	3,546,800	1,703,600
2.2 Promotion of Favorable Environment for Development of the National Metrology System	2,992,000	5,425,525
<b>TOTAL</b>	<b>108,160,000</b>	<b>110,640,000</b>



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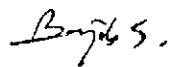
NIMT'S BUDGET 1999-2001(2000-2001)

รหัสงบประมาณ ปี 2545

แผนงาน/โครงการ (งาน)/กิจกรรม	งบประมาณ (บาท)	CODE
<b>แผนงานพัฒนาสถาบันมาตรฐานแห่งชาติ</b>	<b>103,510,875</b>	
1. งานบริหารทั่วไป (สวัสดิการต่าง ๆ, ค่าวัสดุเครื่องเขียน, เครื่องใช้สำนักงาน เป็นต้น)	45,618,880	451100
2. งานจัดหา รักษาพัฒนาคุณภาพมาตรฐานแห่งชาติ	30,621,800	
การรักษาสภาพแวดล้อมห้องปฏิบัติการและการปรับปรุงอาคาร (ซ่อมบำรุงระบบปรับอากาศ, หารีกันเชื้อรา, กั้นห้องปฏิบัติการ ฯลฯ)	1,100,000	451201
การพัฒนาระบบคุณภาพของสถาบัน (ISO/IEC Guide 25/ISO9000)	1,195,000	451202
การสอบเทียบมาตรฐานอ้างอิงของประเทศ	5,717,800	451203
การจัดหามาตรฐานแห่งชาติ (ชื่อเครื่องมือ)	18,029,000	451204
การซ่อมเครื่องมือมาตรฐาน	4,200,000	451205
การเข้าร่วมกิจกรรมเปรียบเทียบผลการวิเคราะห์หว่างประเทศ (Interlaboratory comparisons)	380,000	451206
3. งานพัฒนากำลังคนและกิจกรรม	5,460,895	
การพัฒนากำลังคนของสถาบัน(ฝึกอบรม, จ้างผู้เชี่ยวชาญ)	5,460,895	451300
4. งานพัฒนาขีดความสามารถด้านวิจัยและพัฒนา	2,000,000	451400
5. งานพัฒนาระบบสารสนเทศ	4,640,700	
ด้านสารสนเทศ (ชื่อ Hardware/Software/ค่าซ่อมคอมพิวเตอร์, ค่าต่อสมาชิกอินเทอร์เน็ตฯ)	3,940,700	451501
ด้านห้องสมุด	700,000	451502
6. โครงการก่อสร้างอาคาร และจัดหามาตรฐานสถาบันมาตรฐานแห่งชาติ	15,168,600	451JBIC
ค่าธรรมเนียมธนาคาร (เกิดจากโครงการเงินกู้ JBIC)	1,168,600	
ค่าติดตั้งระบบประปา (เทคโนโลยี)	14,000,000	
ค่าใช้จ่ายอื่นที่เกี่ยวข้องกับโครงการ JBIC		
<b>แผนงานพัฒนาระบบมาตรฐานแห่งชาติ</b>	<b>7,129,125</b>	
1. งานพัฒนาเครือข่ายห้องปฏิบัติการสอบเทียบและกลุ่มผู้รับบริการ	1,703,600	
การบริการสอบเทียบแก่ภาคอุตสาหกรรม(ค่าวัสดุสิ้นเปลืองวิทยาศาสตร์, ใบ certificate, ค่าแบบฟอร์ม CS ค่า work order form ค่ากระดาษ Report และ แบบฟอร์ม อื่น ๆ ที่เกี่ยวกับการให้บริการสอบเทียบ)	1,200,000	452101
การพัฒนาเครือข่ายและคุณภาพเครือข่ายห้องปฏิบัติการ	503,600	452102
2. งานพัฒนาสภาพแวดล้อมที่เอื้อต่อการพัฒนาระบบมาตรฐานแห่งชาติ	5,425,525	
การศึกษาด้านนโยบาย	2,000,000	452201
การระดมความร่วมมือและความช่วยเหลือจากต่างประเทศ(ประชุมองค์กรมาตรฐานวิทยาระหว่างประเทศ)	1,782,325	452202
การส่งเสริมและสนับสนุนการศึกษาด้านมาตรฐาน(จัดสัมมนาประชุมร่วมกับสถาบันการศึกษา)	350,000	452203
การประชาสัมพันธ์	1,293,200	452204
<b>รวมทั้งสิ้น</b>	<b>110,640,000</b>	



ส่วนวิเคราะห์และประสานงาน สำนักผู้อำนวยการ



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Budget for the Project Implementation in NIMT

No.	Title	Description	Budget					Remark
			2001	2002	2003	2004	2005	
1.	IT Equipment	- Copymachine	120,000	132,000	145,200	159,720	175,692	Nikkei
2.	Office supply	- Battery	10,800	11,880	13,068	14,375	15,813	
		- Paper	12,000	13,200	14,520	15,972	17,569	
		- Ink Cartridge	30,000	33,000	36,300	39,930	43,923	
		- Stationery	36,000	39,600	43,560	47,916	52,708	
3.	Document	- Newspaper	32,000	35,200	38,720	42,592	46,851	
4.	Cleaning	- Maid	108,000	118,800	130,680	143,748	158,123	
5.	Telecommunication	- Telephone	120,000	132,000	145,200	159,720	175,692	
		- Fax	60,000	66,000	72,600	79,860	87,846	
6.	Transportation	- Car expense	192,000	211,200	232,320	255,552	281,107	
		- driver	192,000	211,200	232,320	255,552	281,107	
Total			912,800	1,004,080	1,104,488	1,214,937	1,336,431	

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**Annex 5**

National Institute of Metrology (Thailand)

August 27, 2002

No.	Name-Surname	Position	Education	Year of Service	Age	Remark
1	Fit.LL.BUNJOB SUKTAT	Deputy Director	B.Eng.	4.16	53.3	
2	MR. SOMSAK CHARKKIAN	Assistance Director	M.B.A.	2.57	49.6	
3	MR.KITIWUT PHOTIWAT	Internal Auditor	M.B.A.	1.24	36.8	
4	MISS PENSON CHIEWCHALALAI	Assistance Head, Technical Administration Section	B.A.	0.36	36.0	
5	MISS PARIMA KIRDUDOM	Head of Planning and Coordination Section	M.Sc.	1.32	35.4	
6	MRS. JARUWADEE PAWARINPONG	Asst. Sect. Head of Planning and Coordination	M.Ed.	4.05	35.1	
7	MISS NATTANIT PONGJEERAKUMCHORN	Head of International Relations Office Section	MBA.	1.50	35.3	
8	MR. WATSON CHANSAJCHA	Manager of Corporate Planning Dept.	M.Eng.	4.24	39.5	
9	MR.PORNTHAP KITTIPUTPAIBOON	Head of MIS Section	M.Sc.	1.96	32.8	
10	MR.SUPHASIT CHAMPAWONG	Assistance Head, Development & Project Planning Se	M.Sc.	2.21	32.9	
11	MR. PRAWET MAHARATTANASAKUL	Manager, Administration Dept.	M.A.	4.24	41.4	
12	MISS WEERANUCH RERKKRIANGKRAI	Head. Account & Finance Sect.	M.A.	4.09	30.2	
13	MRS.RATTANA LEESUWAT	Assistance Head, General Administration Sect.	B.A.	1.49	33.8	
14	MR.TOSPORN EITHKONG	Head, Human Resource Sect.	M.P.A.	1.09	34.4	
15	MR.CHOOSAK CHUESAIY	Head, Building Maintenance Sect.	B.Eng.	1.10	38.4	

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## National Institute of Metrology (Thailand)

August 27, 2002

No.	Name-Surname	Position	Education	Year of Service	Age	Remark
	MECHANICAL METROLOGY					
1	MR. VEERA TULASOMBAT	Head, Dept. of Mechanical Metrology	B.Eng.	4.24	50.6	
2	Fit.Lt.TAWAT CHANGPAN	Asst.Head, Dept. of Mechanical Metrology	B.A.	3.91	46.4	
3	MR. VIRAT PLANGSANGMAS	Head, Acoustics & Vibration Laboratory	M.Sc.	2.99	48.6	
4	MISS RUNGSIYA WONGSUDIN	Metrologist	M.Sc.	4.20	36.0	
5	MR.WIRUN LAOPORNPICHAYANUWAT	Metrologist Trainee	B.Sc.	1.73	25.8	
6	MISS RUGKANAWAN WONGPITHAYADISAI	Metrologist Trainee	M.Sc.	0.27	25.2	
7	MR.MONCHAI MITAREE	Technician Laboratory	Diploma	2.36	27.5	
8	MR.TASSANAI SANPONPUT	Metrologist	B.Ed.	4.03	31.6	
9	MR.PATIPAT WONGTHEP	Metrologist	B.Eng.	3.99	28.5	
10	MR. SUWAT PHANAKULWIJIT	Metrologist Trainee	B.Sc.	1.40	24.2	
11	MR. ONGSA SAKTHONG	Metrologist Trainee	M.Eng	0.41	24.9	
12	MISS TASANEE PRIRUNROM	Metrologist Trainee	M.Sc.	0.27	24.9	
13	MR.SUMET HEAMAWATANACHAI	Metrologist	M.Eng.	1.78	27.4	
14	MR.WATCHARIN SAMIT	Metrologist Trainee	B.Sc.	1.38	29.6	
15	MISS PATJARAPON TIANGTRONG	Metrologist Trainee	B.Eng	0.46	24.0	
16	MR.PRART JETJUMNONG	Metrologist Trainee	B.Eng.	0.32	25.0	
17	MR. SUTHAM MASRI	Metrologist	M.Eng.	2.98	29.9	
18	MISS RATIRAT SINWEERUTHAI	Metrologist Trainee	M.Eng.	0.23	27.2	
19	MR.PAIROJ RATTANANGKUL	Metrologist	M.Eng.	3.99	28.7	
20	MISS SURAT PATTARACHINDANUWONG	Metrologist	B.Sc.	1.82	26.8	
21	MR. CHANNARONG THANGCHOTIKA	Metrologist Trainee	B.Sc.	0.18	28.0	

National Institute of Metrology (Thailand)

August 27, 2002

No.	Name-Surname	Position	Education	Year of Service	Age	Remark
DIMENSIONAL METROLOGY						
1	MR. ANUSORN TONMUANWAI	Metrologist	B.Sc.	4.20	35.0	
2	MISS KETSAYA VACHARANUKUL	Metrologist	B.Eng.	3.33	25.2	
3	MISS WITCHUDA CHITKOSOL	Metrologist	B.Eng.	3.33	25.9	
4	MRS. MONLUDEE RANUSAWAT	Metrologist	M.Sc.	2.36	29.6	
5	MR. SAMANA PHENGBANGYANG	Metrologist Trainee	M.Sc.	1.72	27.0	
6	MR. NARIN CHANTHAWONG	Metrologist Trainee	B.Sc.	1.40	21.3	
7	MR. MUHUMMAD MADDEN	Metrologist Trainee	B.Sc.	0.21	24.2	
8	MR. JEDSADA WONGSAROJ	Technician Laboratory	Diploma	2.36	31.9	
9	MR. SURASAK KERDKANKARN	Technician Laboratory	Diploma	2.36	34.3	
ELECTRICAL METROLOGY						
1	MRS. AJCHARA CHAROENSOOK	Head, Dept. of Electrical Metrology	M.Sc.	4.24	44.7	
2	MR. SOMCHAI NUAMSETTEE	Head, Time & Frequency Laboratory	Airmen Technical	3.16	47.0	
3	MR. CHALIT KUMTAWEE	Metrologist	Airmen Technical	3.91	40.0	
4	MR. MONTHOL HOMKLINTIAN	Metrologist	B.Sc.	3.82	30.4	
5	MR. SURACHED PUENCHALAD	Metrologist	B.Sc.	4.20	30.9	
6	MR. CHAIWAT JASSADAJIN	Metrologist	B.Eng.	3.99	29.0	
7	MR. SAMNEANG PHAPUKDEE	Metrologist	B.Ind.	1.32	31.8	
8	MR. CHAIRAT WICHIANMONGKONKUN	Metrologist Trainee	M.Eng.	0.46	27.6	
9	MR. SOMCHAI ASAWALERTTRAKUL	Metrologist Trainee	B.Eng.	0.32	30.0	
10	MISS NATENAPIT CHOOKUNHOM	Metrologist Trainee	B.Sc.	1.40	23.7	
11	MR. CHALERMCHAI MONSUKHUM	Metrologist Trainee	B.Sc.	1.15	24.7	

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## National Institute of Metrology (Thailand)

August 27, 2002

No.	Name-Surname	Position	Education	Year of Service	Age	Remark
12	MR. DANAI PATTARAKIJKUL	Metrologist Trainee	B.Sc.	0.41	23.8	
13	MR. THANAPOL WUTTHIWASUTORN	Technician Laboratory	Diploma	2.36	28.1	
14	MRS. WANNEE BOONTITANON	Metrologist	B.Eng.	3.28	24.8	
	THERMOMETRY METROLOGY					
1	MISS THASORN SINHANETI	Metrologist	B.Eng.	3.99	27.4	
2	MR.EKACHAI PUTTITWONG	Metrologist	M.S.	2.90	29.0	
3	MR. NARUDOM NOULKHOW	Metrologist Trainee	M.Sc.	1.72	27.0	
4	MISS CHARUAYRAT YAOKULBODEE	Metrologist Trainee	M.Sc.	0.36	26.6	
5	MR.JATAWAT ARKHAWAKOM	Metrologist Trainee	B.E.	1.72	24.0	
6	MR.PHICHET WONGNUT	Technician Laboratory	Diploma	2.32	30.1	
	CHEMICAL METROLOGY					
1	MR. CHARUN Yafa	Metrologist	M.Sc.	3.33	29.9	
2	MR. BUNTHOON LAONGSRI	Metrologist	M.S.	2.78	28.7	
3	MISS CHEERAPA BOONYAKONG	Metrologist	M.Eng.	2.28	30.2	
4	MISS NONGLUCK TANGPAISARNKUL	Metrologist Trainee	M.Sc.	0.27	26.1	

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## Annex 6

## List of Delivered Equipment by ODA Loan

as of August 27, 2002

Fields	Item No.	Description
Acoustic	AQ-1/001/1	STANDARD MICROPHONE
	AQ-1/001/2	PREAMPLIFIER
	AQ-1/002/1	STANDARD MICROPHONE
	AQ-1/002/2	PREAMPLIFIER
	AQ-1/003/1	STANDARD MICROPHONE
	AQ-1/003/2	PREAMPLIFIER
	AQ-1/004/1	STANDARD MICROPHONE
	AQ-1/004/2	PREAMPLIFIER
	AQ-1/005	CALIBRATION SYSTEM FOR MICROPHONE AND PISTONPHONE
	AQ-1/006	AMPLIFIER
	AQ-1/007	RECIPROCITY CALIBRATION SYSTEM
	AQ-1/008	DIGITAL THERMOMETER
	AQ-1/012	DIGITAL THERMOMETER
	AQ-1/013	THERMOMETER SENSORS
	AQ-1/015	HUMIDITY (DATA LOGGER)
Resistance	EM-1/018	KELVIN-VARLEY VOLTAGE DIVIDER
Capacitance	EM-1/038	AC/DC TRANSFER STANDARD
	EM-1/039	AC/DC VOLTAGE STANDARD (MULTIFUNCTION CALIBRATOR)
	EM-1/045	CAPACITANCE BRIDGE
AC Voltage	EM-2/016	DIGITAL MULTIMETER
	EM-2/017	AC/DC VOLTAGE STANDARD
	EM-2/048	DIGITAL AC/DC TRANSFER STANDARD
	EM-2/059	DIGITAL MULTIMETER
	EM-2/084/1	PHASE STANDARD
	EM-2/084/2	PHASE VERIFICATION BRIDGE
AC Current	EM-2/087	AC/DC TRANSFER STANDARD
	EM-2/090	AC CURRENT CALIBRATOR (UP TO 100A)
Inductance	EM-2/250	POWER REFERENCE STANDARD
	EM-2/251	AC VOLTAGE SOURCE
DC High Voltage	EM-3/002	HIGH VOLTAGE SOURCE 100 KV
	EM-3/004	DIGITAL VOLTMETER
RF Voltage	EM-5/001	THERMAL VOLTAGE CONVERTER SETS
	EM-5/003/01	AC/DC TRANSFER STANDARD
	EM-5/003/05	THERMAL TRANSFER STANDARD & SOFTWARE
	EM-5/004	MICROPOTENTIOMETER SET
RF Attenuation	EM-5/006	VHF ATTENUATOR
RF Power	EM-5/007	RF POWER METER CALIBRATION SYSTEM
	EM-5/014	DIGITAL MULTIMETER
	EM-5/018	POWER SENSOR
	EM-5/019	POWER METER
	EM-5/020	DIRECTIONAL COUPLERS
	EM-5/026	MICROWAVE ACCESSORIES SET
	EM-5/026/14	VERIFICATION KIT
Straightness	L-5/019	STRAIGHT EDGES, STEEL & GRANITE
Angle	L-6/012	SMALL ANGLE GENERATOR
Roundness	L-7/006	ROUNDNESS TESTER
Mass	M-1/013	BALANCE, CAPACITY 5 G, RESOLUTION 0.1 G
	M-1/014	STANDARD WEIGHT 1 KG, OIML CLASS E1
	M-1/016	GAUSSMETER



Large Weight	M-3/015	BALANCE, CAPACITY 2 KG
Reference Materials	QM-3/001	ANALCAL BALANCE, CAPACITY 205 G SENSITIVITY 1MG
	QM-3/002	BALANCE, CAPACITY 5100G, SENSITIVITY 1 MG
	QM-3/003	EQUIPMENT FOR PRODUCING PURE WATER
Fixed Point	T-1/065	DIGITAL MULTIMETER
	T-1/066	GPIB INTERFACE CARD AND CABLE
	T-1/068	STANDARD PLATINUM RESISTANCE THERMOMETER
	T-1/070	DATA LOGGER
	T-1/078	SECONDARY STANDARD PRT
Humidity	T-3/006	PRIMARY STANDARD OR HUMIDITY GENERATOR
	T-3/007	CHILLED MIRROR DEW POINT ANALYZER AND SENSORS
Time and Frequency	TF-1/001	FREQUENCY COUNTER

*L. J.*

*Bjls.*

## 5. 討議議事録 (R / D)

別添


**RECORD OF DISCUSSIONS BETWEEN  
JAPAN INTERNATIONAL COOPERATION AGENCY AND  
AUTHORITIES CONCERNED OF THE GOVERNMENT OF  
THE KINGDOM OF THAILAND  
ON JAPANESE TECHNICAL COOPERATION FOR THE PROJECT ON  
TECHNICAL STRENGTHENING OF NATIONAL INSTITUTE OF  
METROLOGY (THAILAND) PHASE 1**

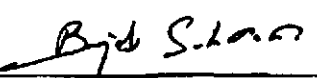
In response to the request of the Government of the Kingdom of Thailand, the Government of Japan has decided to cooperate under Japan-Thailand Technical Cooperation Project on the Technical Strengthening of National Institute of Metrology (Thailand) Phase I (hereinafter referred to as "the Project") in accordance with the Agreement on Technical Cooperation between the Government of Japan and the Government of the Kingdom of Thailand signed on 5 November, 1981, the Embassy of Japan's Note No. 062/02 dated 25 April, 2002 and the Department of Technical and Economic Cooperation's Note No. 2112/10183 dated June 10, 2002.

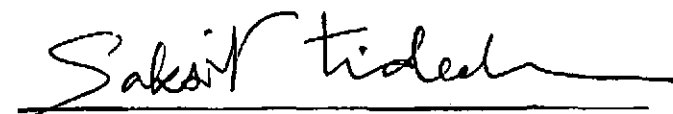
Accordingly, Japan International Cooperation Agency (hereinafter referred to as "JICA"), the executing agency responsible for the implementation of the technical cooperation programme of the Government of Japan, will cooperate with National Institute of Metrology (Thailand) (hereinafter referred to as "NIMT") of the Government of the Kingdom of Thailand for the Project.

JICA and NIMT had a series of discussions on the framework of the Project. As a result of the discussions, JICA and NIMT agreed on the matters referred to in the document attached hereto.

Bangkok, September 16, 2002

  
 \_\_\_\_\_  
 Mr. Shinya Nakai  
 Resident Representative  
 JICA Thailand Office

  
 \_\_\_\_\_  
 Mr. Bunjob Suktat  
 Acting Director  
 National Institute of Metrology (Thailand)  
 Ministry of Science, Technology and  
 Environment  
 The Kingdom of Thailand

  
 \_\_\_\_\_  
 Dr. Saksit Tridech  
 Deputy Permanent Secretary  
 Ministry of Science, Technology and  
 Environment  
 The Kingdom of Thailand

## ATTACHED DOCUMENT

### I COOPERATION BETWEEN JAPANESE AND THAI SIDES

- 1 NIMT will implement the Project on Technical Strengthening of National Institute of Metrology (Thailand) Phase 1. (hereinafter referred to as "the Project") in cooperation with 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 1 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 year will be arranged by both sides.

### II MEASURES TO BE TAKEN BY JAPANESE SIDE

In accordance with the laws and regulations in force in Japan and the Agreement on Technical Cooperation between the Government of Japan and the Government of the Kingdom of Thailand on November 5, 1981 (hereinafter referred to as "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 PROCUREMENT OF MACHINERY AND EQUIPMENT  
Based on the concept that the Project is designed for technology transfer with the equipment purchased by ODA Loan of the Government of Japan, the provision of additional equipment can not be included within the framework of the Project. Therefore, the Japanese side requested the Thai side to purchase all of necessary equipment by the twenty fourth of ODA Loan and the Thai side agreed that the necessary equipment for technology transfer would be purchased by this ODA Loan and/or by NIMT.
- 3 TRAINING OF THAI COUNTERPART PERSONNEL IN JAPAN  
JICA will receive the Thai counterpart personnel connected with the Project for technical training in Japan.

### III MEASURES TO BE TAKEN BY THAI SIDE

- 1 NIMT 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 NIMT 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.

- 4 Head, Department of Electricity, NIMT, as the Project Coordinator will assist the Director to coordinate activities between NIMT and JICA.
- 5 NIMT 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.
- 6 In accordance with the provision of Article IV-(b) of the Agreement, NIMT will provide the services of Thai counterpart personnel and administrative personnel as listed in Annex III.
- 7 In accordance with the provision of Article IV-(a) of the Agreement, NIMT will provide the buildings and facilities as listed in Annex IV.
- 8 In accordance with the laws and regulations in force in the Kingdom of Thailand, NIMT will take necessary measures to supply or replace machinery, equipment, instruments, vehicles, tools, spare parts and any other materials necessary for the implementation of the Project at its own expense.
- 9 In accordance with the laws and regulations in force in the Kingdom of Thailand, NIMT will take necessary measures to bear the running expenses necessary for the implementation of the Project.

#### IV ADMINISTRATION OF THE PROJECT

- 1 Director, NIMT, as the Project Director, will bear overall responsibility for the administration and implementation of the Project.
- 2 Deputy Director, NIMT, as the Associate Project Director will assist the Director to implement the Project smoothly and will be responsible particularly for the technical matters of the Project.
- 3 Assistant Director, NIMT, as the Assistant Project Director will assist the Director to implement the Project smoothly and will be responsible for the administration matters.
- 4 Head, Department of Electricity, NIMT as the Project Coordinator will assist the Director to coordinate activities between NIMT and JICA.
- 5 The Japanese Chief Advisor as the Japanese team leader will provide necessary recommendations and advice to the Project Director, the Associate Project Director and the Assistant Project Director on any matters pertaining to the implementation of the Project.
- 6 The Japanese experts will give necessary technical guidance and advice to Thai counterpart personnel on technical matters pertaining to the implementation of the Project.
- 7 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 V.

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**V JOINT EVALUATION**

Evaluation of the Project will be conducted jointly by JICA, NIMT and the authorities concerned 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 between JICA and NIMT 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 from the people of the Kingdom of Thailand, the Government of the Kingdom of Thailand 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 two (2) years from October 16, 2002.

Annex I: MASTER PLAN

Annex II: LIST OF JAPANESE EXPERTS

Annex III: LIST OF THAI COUNTERPART AND ADMINISTRATIVE PERSONNEL

Annex IV: LIST OF LAND, BUILDINGS AND FACILITIES

Annex V: JOINT COORDINATING COMMITTEE

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### Annex 1 Master Plan

**Project Design Matrix (PDM)**

Project for Technical Strengthening of National Institute of Metrology (Thailand)

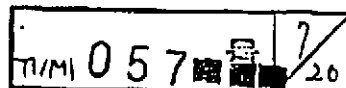
Target group:

- Calibration Services Agencies such as TISTK and DSS
- Domestic Industries in Thailand (especially export industries and enterprises trying to acquire ISO9000, ISO14000.)  
(According to the plan of TIST in Ministry of Industry, 1212 factories acquired ISO9000. in August 1999.)

Project Period: October 1, 2002-September 30, 2004

Partially Summary	Verifiable Indicators	Means of Verifications	Important Assumptions
<b>Overall Goal</b> NIMT is capable to maintain and disseminate the National Measurement Standards with internationally recognized level of accuracy.	1 NIMT actively participates in the Global MRA. 2 The traceability system of Thailand is firmly established.	1-1 Survey and verify NIMT's activities 1-2 List in Appendix B and C of Global MRA 1-3 Calibration laboratories list of NIMT 1-4 The chain of measurement network in Thailand	a There is no drastic change in political and economic situation in Thailand. b The policy in Thai Government on the role or assignment of NIMT and reference standard calibration services agencies remain unchanged.
<b>Project Purpose</b> NIMT establishes and manages National Measurement Standards.	1 The technical ability of counterparts in 6 fields of measurement standards in NIMT is strengthened. 2 Calibration measurement capability is enhanced. 2-1 The quantities of calibration services are increased. 2-2 The accuracy of calibration services is enhanced. 2-3 The range of calibration services is widened.	1 Monitoring survey of NIMT's activities 2 Uncertainty budget sheet 2-1 Record of the quantities of calibration services 2-2 Record of the accuracy of calibration services 2-3 Record of the range of calibration services	a There is no change in the role of NIMT as the institute for maintaining national measurement standard.
<b>Outputs</b> 1 The operation and administration of the Project are enhanced. 2 The equipment is operated and maintained properly. 3 The technical capability of C/P is upgraded. 4 Accuracy of national measurement standards is improved. 5 NIMT disseminates national measurement standards properly.	1-1 Staff and budget are allocated to the Project. 2-1 National measurement standards are installed and established. 2-2 Equipment are operated and maintained. 2-3 Manuals of operation and maintenance management are provided. 3-1 Technical Cooperation Program is enacted. 3-2 Counterparts are appropriately assigned. 3-3 Technical capability of calibration is enhanced. 4-1 Measurement standards are established and maintained. 4-2 Environmental management technology of calibration laboratories is improved. 5-1 Calibration technology for reference standards is improved. 5-2 Calibration procedures are created.	1-1 Staff allocated list, budget, organization chart 2-1-1 Equipment inventory. 2-1-2 Equipment manuals and their list 2-2 Maintenance records or calibration record of equipment 2-3 Operation manual and maintenance management manual 3-1 Technical Cooperation Program sheet 3-2 Allocation list of counterparts by field 3-3-1 Budget sheet on uncertainty 3-3-2 Evaluation sheet of technical areas for 3-3-3 Records of seminar and in-house technical presentation 4-1 Records of the accuracy of national measurement standards. 4-2 File of environmental management sheet for every laboratory 5-1-1 Traceability chain of NIMT 5-1-2 Calibration certificate 5-2-1 Calibration procedure and their list 5-2-2 Technical notes and their list	a There is no change in C/P employment plan. b There is no change in budget allocation and policy. c There is no change in organization which influence directly in the Project. d Installation and setting up of all machinery are properly completed. e Counterparts trained in the Project remain at NIMT.
<b>Activities</b> 1-1 To allocate necessary personnel as planned. 1-2 To make budget plan and execute properly. 1-3 To make action plan and implement as planned 2-1 To install and operate equipments properly. (mainly provided by ODA Loan) 2-2 To operate and maintain equipment. 2-3 To make manuals of operation and maintenance management. 3-1 To make Technical Cooperation Program. 3-2 To assess existing level of basic technical capability of counterpart personnel. 3-3 To evaluate technical capability of counterpart after technical transfer. 4-1 To establish and maintain measurement standards. 4-2 To improve environmental management technology of calibration laboratories. 5-1 To improve the calibration technology for reference standards based on national standard. 5-2 To make calibration procedure.	<b>Inputs</b> <Japanese side> 1 (1) Dispatch of Japanese Experts Long Term Experts a Chief Advisor b Project Coordinator c Standards on Physics d Standards on Electromagnetics (2) Short Term Experts Appropriate experts will be dispatched as necessary times. (Maximum 10 persons per year) 2 C/P training in Japan • Maximum 5 persons per year 3 Provision of Machinery and Equipment Machinery and equipment only for Japanese experts to use for technical transfer • Equipment is provided by ODA Loan 4 Supporting Local Cost	<Thai side> 1 Provision of building, facility and space for the Project 2 Allocation of the C/P and administrative personnel (1) Administrative C/P (2) Technical C/P (3) Staff in charge of the Project 3 Maintenance of machinery and equipment 4 Necessary budget for the implementation of the Project	a It will not be provided that adjust do not meet needs. b The C/P operate at NIMT.
	<b>Prerequisites</b> a Equipment by ODA Loan for the Project is procured as planned. b New staff are employed as planned.		

*Sakchai P.*  
*By S.S.*



- 1 Chief advisor as a long-term expert (two (2) years from October, 2002)
  - To provide necessary recommendations and advice to establish and manage the internationally recognized level of National Measurement Standards and to strengthen the National Measurement System.
  - To assume responsibility on planning of strategy/ institutional framework/ relevant activities comprehensively.
  - To discuss and report the situation of project management and technology transfer, and future plan through the Joint Coordinating Committee, etc.
  - To prepare the Project evaluation and monitoring with related organizations.
  - To provide necessary recommendations and advice on the technology transfer to the experts.
  
- 2 Project coordinator as a long-term expert (two (2) years from October, 2002)
  - To assist chief advisor in 11-1 above to identify the situation and progress of the management of the Project to achieve Project purpose.
  - To promote the resolution of the problems, to manage the budget, to make necessary contacts and coordination, to prepare good environment for the task and the life of experts, for implementing the Project.
  
- 3 Expert on Electromagnetic Standards. (two (2) years from October, 2002)
  - To transfer technology on Electromagnetic standards.
  - To assist planning activities such as strategy, seminar, event and relevant activities, technically
  
- 4 Expert on Standards on Physics (two (2) years from October, 2002)
  - To transfer technology on Standards on Physics.
  - To assist planning activities such as strategy, seminar, event and relevant activities, technically
  
- 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 7. Specific fields of short-term experts for the second year will be considered by both sides.

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Annex III LIST OF THAI COUNTERPART AND ADMINISTRATIVE PERSONNEL

- 6 Counterpart personnel
  - 1) Administrative counterpart personnel
  - 2) Technical counterpart personnel
  - 3) Head of Laboratory
  - 4) Metrologists
- 7 Administrative personnel
- 8 Supporting staff
- 9 Any other necessary personnel for the smooth implementation of the Project

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Annex IV LIST OF LAND, BUILDINGS AND FACILITIES

- 10 Office space and necessary facilities for the Japanese Experts
- 11 Office space and necessary facilities for the Thai counterpart personnel
- 12 Lecture rooms and meeting rooms necessary for the transfer of technology
- 13 Buildings, facilities and space necessary for operation of the equipment to be procured by ODA Loan of the Government of Japan
- 14 Other facilities mutually agreed upon as necessary for the implementation of the Project

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Annex V JOINT COORDINATING COMMITTEE

15 Functions

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

- 1) To settle on the Annual Cooperation Plan of the Project in line with the Project Design Matrix (PDM), the Plan of Operations (PO) formulated under the framework of the Record of Discussions;
- 2) To coordinate necessary actions to be taken by both sides;
- 3) To review the overall progress of the PDM and PO, and,
- 4) To exchange views on major issues arising from or in connection with the PDM and PO.

16 Composition

- 1) Chairperson  
Director, National Institute of Metrology (Thailand) (NIMT)

2) Committee Members:

(Thai side)

- Representative(s), Department of Technical and Economic Cooperation (DTEC)
- Representative(s), Ministry of Science and Technology and Environment (MOSTE)
- Representative(s), Thai Chambers of Commerce or Board of Investment
- Representative(s), Thai User(s)
- Other personnel concerned with the Project decided by the Thai side, if necessary
- Deputy Director, National Institute of Metrology (Thailand) (NIMT)
- Assistant Director, National Institute of Metrology (Thailand) (NIMT)
- Head, Department of Electricity, National Institute of Metrology (Thailand) (NIMT)
- Heads of Departments, National Institute of Metrology (Thailand) (NIMT)

(Japanese side)

- Chief Advisor
- Project Coordinator
- Japanese Experts designated by the Chief Advisor
  - a) Expert on Electromagnetic Standards
  - b) Expert on Standards on Physics
- Representative(s), JICA Thailand Office
- Representative(s), JBIC Representative Office in Bangkok
- Representative(s), Japanese Chambers of Commerce in Thailand (if necessary)
- Other personnel concerned to be decided and/or dispatched by JICA (if necessary)

Note :

- 17 Official(s) of the Embassy of Japan in the Kingdom of Thailand may attend the Committee as observer(s).
- 18 Member of National Metrology Board in the Kingdom of Thailand may attend the Committee as observer(s).

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Attachment 1

Tentative Schedule of Implementation (TSI)

Calendar Year (Thailand)	2001			2002				2003				2004	
Japanese Fiscal Year	II	III	IV	I	II	III	IV	I	II	III	IV	I	II
<b>Term of Technical Cooperation</b>	<b>Term of Technical Cooperation</b>												
<b>Japanese Side</b>													
<b>I. Dispatch of Mission</b>													
(1) Final Evaluation (Management Consultation Team will be dispatched, if necessary)													
<b>II. Dispatch of Long-Term Experts</b>													
(1) Chief Advisor	Chief Advisor												
(2) Coordinator	Coordinator												
(3) Physical Standard	Physical Standard												
(4) Electro-magnetic Standard	Electro-magnetic Standard												
<b>III. Dispatch of short-term Expert</b>	10 short-term experts on specific topics will be dispatched annually.												
<b>IV. Training of C/P Personnel in Japan</b>	5 C/P will be accepted in Japan annually.												
<b>Thai Side</b>													
<b>I. Building and Facilities</b>	Building and Facilities												
<b>II. Machinery and Equipment</b>	Machinery and Equipment												
<b>III. Allocation of C/P Personnel and Necessary Staff</b>	Allocation of C/P Personnel and Necessary Staff												
<b>IV. Allocation of Budget</b>	Allocation of Budget												

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Attachment 2

Annual Tentative Schedule of Implementation (ATSI)

Calendar Year (Thailand)	2001			2002						2003														
Japanese Fiscal Year	2001			2002			2002			2003			2003											
	7	8	9	10	11	12	1	2	3	4	5	6	7	8	9	10	11	12	1	2	3	4	5	6
<b>Term of Technical Cooperation</b>																								
<b>Japanese Side</b>																								
I. Dispatch of Mission																								
(1) Second Japanese Preparatory Study																								
(2) Project Design Team																								
II. Dispatch of Long-Term Experts																								
(1) Chief Advisor																								
(2) Coordinator																								
(3) Physical Standard																								
(4) Electro-magnetic Standard																								
III. Dispatch of short-term Experts																								
(1) Acoustics and Vibration standard																								
(2) Wavelength Standard																								
(3) Form ( Plug/Ring) standard																								
(4) Form ( Roundness) standard																								
(5) Form ( Roughness) standard																								
(6) Hardness Standard																								
(7) Radiation thermometry standard																								
(8) Improving the confidence of National Measurement Standards (2 persons)																								
(9) Calibration procedure																								
(*) pH solution standard																								
(*) Vibration standard																								
IV. Training of C/P Personnel in Japan																								
(1) Acoustics and Vibration standard																								
(2) Time and Frequency standard																								
(3) Wavelength standard																								
(4) Form standard																								
(5) Hardness standard																								
(*) Radiation thermometry standard																								
(*) pH solution standard																								
(*) Vibration standard																								
<b>Thai Side</b>																								
I. Building and Facilities																								
II. Machinery and Equipment																								
III. Allocation of C/P Personnel and Necessary Staff																								
IV. Allocation of Budget																								

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*Sobek T. Byggs.*

Attachment 3

Plan of Operation (PO)

Calendar Year (Thailand)	2001				2002				2003				2004	
Japanese Fiscal Year	2001		2002		2003		2003		2004		2004			
	III	IV	I	II	III	IV	I	II	III	IV	I	II		
<b>Tenn of Technical Cooperation</b>														
1-1 To allocate necessary personnel as planned.														
1-2 To make budget plan and execute properly.														
1-3 To make action plan and implement as planned.														
2-1 To install and commit equipment properly.														
2-2 To operate and maintain equipment.														
2-3 To make manuals of operation and maintenance management.														
3-1 To make Technical Cooperation Program.														
3-2 To assess existing level of basic technical capability of counterpart personnel.														
3-3 To evaluate technical capability of counterpart after technical transfer.														
4-1 To establish and maintain measurement standards.														
4-2 To improve environmental management technology of calibration laboratories.														
5-1 To improve the calibration technology for reference standards based on national standard.														
5-2 To make calibration procedure.														

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*Sakul Bygs.*

Annual Plan of Operations (APO)

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Calendar Year	2001			2002						2003																	
Japanese Fiscal Year	10	11	12	1	2	3	4	5	6	7	8	9	10	11	12	1	2	3	4	5	6						
<b>Term of Technical Cooperation</b>																											
<b>1. The operation and administration of the Project are enhanced.</b>																											
1-1 To allocate necessary personnel as planned.	Address for long term event																										
1-2 To make budget plan and execute properly.	Address for long term event																										
1-3 To make action plan and implement as planned.	Address for long term event																										
<b>2. The equipment is operated and maintained properly.</b>																											
2-1 To install and commit equipment properly.	Address for long term event																										
2-2 To operate and maintain equipment.	Equipment and maintenance																										
2-3 To make manuals of operation and maintenance management.	Address for long term event																										
2-2-1 Acoustic	<table border="1" style="width: 100%; border-collapse: collapse;"> <tr> <td>Investing in Japan</td> <td>Address</td> <td>Dist.</td> </tr> <tr> <td>1. Planned in Japan</td> <td>1. Dist.</td> <td>1. Dist.</td> </tr> </table>																					Investing in Japan	Address	Dist.	1. Planned in Japan	1. Dist.	1. Dist.
Investing in Japan	Address	Dist.																									
1. Planned in Japan	1. Dist.	1. Dist.																									
2-2-2 Time and Frequency	<table border="1" style="width: 100%; border-collapse: collapse;"> <tr> <td>Investing in Japan</td> <td>Address</td> <td>Dist.</td> </tr> <tr> <td>1. Planned in Japan</td> <td>1. Dist.</td> <td>1. Dist.</td> </tr> </table>																					Investing in Japan	Address	Dist.	1. Planned in Japan	1. Dist.	1. Dist.
Investing in Japan	Address	Dist.																									
1. Planned in Japan	1. Dist.	1. Dist.																									
2-2-2 Wavelength	<table border="1" style="width: 100%; border-collapse: collapse;"> <tr> <td>Investing in Japan</td> <td>Address</td> <td>Dist.</td> </tr> <tr> <td>1. Planned in Japan</td> <td>1. Dist.</td> <td>1. Dist.</td> </tr> </table>																					Investing in Japan	Address	Dist.	1. Planned in Japan	1. Dist.	1. Dist.
Investing in Japan	Address	Dist.																									
1. Planned in Japan	1. Dist.	1. Dist.																									
2-2-2 Form	<table border="1" style="width: 100%; border-collapse: collapse;"> <tr> <td>Investing in Japan</td> <td>Address</td> <td>Dist.</td> </tr> <tr> <td>1. Planned in Japan</td> <td>1. Dist.</td> <td>1. Dist.</td> </tr> </table>																					Investing in Japan	Address	Dist.	1. Planned in Japan	1. Dist.	1. Dist.
Investing in Japan	Address	Dist.																									
1. Planned in Japan	1. Dist.	1. Dist.																									
2-2-2-1 Plug/Ring	<table border="1" style="width: 100%; border-collapse: collapse;"> <tr> <td>Investing in Japan</td> <td>Address</td> <td>Dist.</td> </tr> <tr> <td>1. Planned in Japan</td> <td>1. Dist.</td> <td>1. Dist.</td> </tr> </table>																					Investing in Japan	Address	Dist.	1. Planned in Japan	1. Dist.	1. Dist.
Investing in Japan	Address	Dist.																									
1. Planned in Japan	1. Dist.	1. Dist.																									
2-2-2-2 Roundness	<table border="1" style="width: 100%; border-collapse: collapse;"> <tr> <td>Investing in Japan</td> <td>Address</td> <td>Dist.</td> </tr> <tr> <td>1. Planned in Japan</td> <td>1. Dist.</td> <td>1. Dist.</td> </tr> </table>																					Investing in Japan	Address	Dist.	1. Planned in Japan	1. Dist.	1. Dist.
Investing in Japan	Address	Dist.																									
1. Planned in Japan	1. Dist.	1. Dist.																									
2-2-2-3 Roughness	<table border="1" style="width: 100%; border-collapse: collapse;"> <tr> <td>Investing in Japan</td> <td>Address</td> <td>Dist.</td> </tr> <tr> <td>1. Planned in Japan</td> <td>1. Dist.</td> <td>1. Dist.</td> </tr> </table>																					Investing in Japan	Address	Dist.	1. Planned in Japan	1. Dist.	1. Dist.
Investing in Japan	Address	Dist.																									
1. Planned in Japan	1. Dist.	1. Dist.																									
2-2-3 Hardness	<table border="1" style="width: 100%; border-collapse: collapse;"> <tr> <td>Investing in Japan</td> <td>Address</td> <td>Dist.</td> </tr> <tr> <td>1. Planned in Japan</td> <td>1. Dist.</td> <td>1. Dist.</td> </tr> </table>																					Investing in Japan	Address	Dist.	1. Planned in Japan	1. Dist.	1. Dist.
Investing in Japan	Address	Dist.																									
1. Planned in Japan	1. Dist.	1. Dist.																									
2-2-4 pH solution standard	<table border="1" style="width: 100%; border-collapse: collapse;"> <tr> <td>Investing in Japan</td> <td>Address</td> <td>Dist.</td> </tr> <tr> <td>1. Planned in Japan</td> <td>1. Dist.</td> <td>1. Dist.</td> </tr> </table>																					Investing in Japan	Address	Dist.	1. Planned in Japan	1. Dist.	1. Dist.
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1. Planned in Japan	1. Dist.	1. Dist.																									
2-2-5 Radiation Thermometry	<table border="1" style="width: 100%; border-collapse: collapse;"> <tr> <td>Investing in Japan</td> <td>Address</td> <td>Dist.</td> </tr> <tr> <td>1. Planned in Japan</td> <td>1. Dist.</td> <td>1. Dist.</td> </tr> </table>																					Investing in Japan	Address	Dist.	1. Planned in Japan	1. Dist.	1. Dist.
Investing in Japan	Address	Dist.																									
1. Planned in Japan	1. Dist.	1. Dist.																									
2-2-6 Vibration	<table border="1" style="width: 100%; border-collapse: collapse;"> <tr> <td>Investing in Japan</td> <td>Address</td> <td>Dist.</td> </tr> <tr> <td>1. Planned in Japan</td> <td>1. Dist.</td> <td>1. Dist.</td> </tr> </table>																					Investing in Japan	Address	Dist.	1. Planned in Japan	1. Dist.	1. Dist.
Investing in Japan	Address	Dist.																									
1. Planned in Japan	1. Dist.	1. Dist.																									
<b>3. The technical capability of C/P is upgraded.</b>																											
3-1 To make Technical Cooperation Program.	Draft																										
3-2 To assess existing level of basic technical capability of counterpart personnel.	Assessment																										
3-3 To evaluate technical capability of counterpart personnel after technical transfer.	Evaluation																										
<b>4. Accuracy of national measurement standards is improved.</b>																											
4-1 To establish and maintain measurement standards.	Draft																										
4-1-1 Acoustic	<table border="1" style="width: 100%; border-collapse: collapse;"> <tr> <td>Investing in Japan</td> <td>Address</td> <td>Dist.</td> </tr> <tr> <td>1. Planned in Japan</td> <td>1. Dist.</td> <td>1. Dist.</td> </tr> </table>																					Investing in Japan	Address	Dist.	1. Planned in Japan	1. Dist.	1. Dist.
Investing in Japan	Address	Dist.																									
1. Planned in Japan	1. Dist.	1. Dist.																									
4-1-2 Time and Frequency	<table border="1" style="width: 100%; border-collapse: collapse;"> <tr> <td>Investing in Japan</td> <td>Address</td> <td>Dist.</td> </tr> <tr> <td>1. Planned in Japan</td> <td>1. Dist.</td> <td>1. Dist.</td> </tr> </table>																					Investing in Japan	Address	Dist.	1. Planned in Japan	1. Dist.	1. Dist.
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4-1-2 Wavelength	<table border="1" style="width: 100%; border-collapse: collapse;"> <tr> <td>Investing in Japan</td> <td>Address</td> <td>Dist.</td> </tr> <tr> <td>1. Planned in Japan</td> <td>1. Dist.</td> <td>1. Dist.</td> </tr> </table>																					Investing in Japan	Address	Dist.	1. Planned in Japan	1. Dist.	1. Dist.
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1. Planned in Japan	1. Dist.	1. Dist.																									
4-1-2 Form	<table border="1" style="width: 100%; border-collapse: collapse;"> <tr> <td>Investing in Japan</td> <td>Address</td> <td>Dist.</td> </tr> <tr> <td>1. Planned in Japan</td> <td>1. Dist.</td> <td>1. Dist.</td> </tr> </table>																					Investing in Japan	Address	Dist.	1. Planned in Japan	1. Dist.	1. Dist.
Investing in Japan	Address	Dist.																									
1. Planned in Japan	1. Dist.	1. Dist.																									
4-1-2-1 Plug/Ring	<table border="1" style="width: 100%; border-collapse: collapse;"> <tr> <td>Investing in Japan</td> <td>Address</td> <td>Dist.</td> </tr> <tr> <td>1. Planned in Japan</td> <td>1. Dist.</td> <td>1. Dist.</td> </tr> </table>																					Investing in Japan	Address	Dist.	1. Planned in Japan	1. Dist.	1. Dist.
Investing in Japan	Address	Dist.																									
1. Planned in Japan	1. Dist.	1. Dist.																									
4-1-2-2 Roundness	<table border="1" style="width: 100%; border-collapse: collapse;"> <tr> <td>Investing in Japan</td> <td>Address</td> <td>Dist.</td> </tr> <tr> <td>1. Planned in Japan</td> <td>1. Dist.</td> <td>1. Dist.</td> </tr> </table>																					Investing in Japan	Address	Dist.	1. Planned in Japan	1. Dist.	1. Dist.
Investing in Japan	Address	Dist.																									
1. Planned in Japan	1. Dist.	1. Dist.																									
4-1-2-3 Roughness	<table border="1" style="width: 100%; border-collapse: collapse;"> <tr> <td>Investing in Japan</td> <td>Address</td> <td>Dist.</td> </tr> <tr> <td>1. Planned in Japan</td> <td>1. Dist.</td> <td>1. Dist.</td> </tr> </table>																					Investing in Japan	Address	Dist.	1. Planned in Japan	1. Dist.	1. Dist.
Investing in Japan	Address	Dist.																									
1. Planned in Japan	1. Dist.	1. Dist.																									
4-1-3 Hardness	<table border="1" style="width: 100%; border-collapse: collapse;"> <tr> <td>Investing in Japan</td> <td>Address</td> <td>Dist.</td> </tr> <tr> <td>1. Planned in Japan</td> <td>1. Dist.</td> <td>1. Dist.</td> </tr> </table>																					Investing in Japan	Address	Dist.	1. Planned in Japan	1. Dist.	1. Dist.
Investing in Japan	Address	Dist.																									
1. Planned in Japan	1. Dist.	1. Dist.																									
4-1-4 pH solution standard	<table border="1" style="width: 100%; border-collapse: collapse;"> <tr> <td>Investing in Japan</td> <td>Address</td> <td>Dist.</td> </tr> <tr> <td>1. Planned in Japan</td> <td>1. Dist.</td> <td>1. Dist.</td> </tr> </table>																					Investing in Japan	Address	Dist.	1. Planned in Japan	1. Dist.	1. Dist.
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4-1-5 Radiation Thermometry	<table border="1" style="width: 100%; border-collapse: collapse;"> <tr> <td>Investing in Japan</td> <td>Address</td> <td>Dist.</td> </tr> <tr> <td>1. Planned in Japan</td> <td>1. Dist.</td> <td>1. Dist.</td> </tr> </table>																					Investing in Japan	Address	Dist.	1. Planned in Japan	1. Dist.	1. Dist.
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1. Planned in Japan	1. Dist.	1. Dist.																									
4-1-6 Vibration	<table border="1" style="width: 100%; border-collapse: collapse;"> <tr> <td>Investing in Japan</td> <td>Address</td> <td>Dist.</td> </tr> <tr> <td>1. Planned in Japan</td> <td>1. Dist.</td> <td>1. Dist.</td> </tr> </table>																					Investing in Japan	Address	Dist.	1. Planned in Japan	1. Dist.	1. Dist.
Investing in Japan	Address	Dist.																									
1. Planned in Japan	1. Dist.	1. Dist.																									
4-2 To improve environmental management technology of calibration laboratories.	Draft																										

*Schick* *By 6.5.*

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Annual Plan of Operations (APO)

Calendar Year	2001			2002								2003																											
Japanese Fiscal Year	10	11	12	1	2	3	4	5	6	7	8	9	10	11	12	1	2	3	4	5	6																		
5. NIMT disseminates national measurement standards properly (1).																																							
5-1 To improve the calibration technology for reference standards based on national standard.																																							
5-1-1 Acoustic																																							
5-1-2 Time and Frequency																																							
5-1-2 Wavelength																																							
5-1-2 Form																																							
5-1-2-1 Plug/Ring																																							
5-1-2-2 Roundness																																							
5-1-2-3 Roughness																																							
5-1-3 Hardness																																							
5-1-4 pH solution standard																																							
5-1-5 Radiation Thermometry																																							
5-1-6 Vibration																																							
5. NIMT disseminates national measurement standards properly (2).																																							
5-2 To make calibration procedure.																																							
5-2-1 Acoustic																																							
5-2-2 Time and Frequency																																							
5-2-2 Wavelength																																							
5-2-2 Form																																							
5-2-2-1 Plug/Ring																																							
5-2-2-2 Roundness																																							
5-2-2-3 Roughness																																							
5-2-3 Hardness																																							
5-2-4 pH solution standard																																							
5-2-5 Radiation Thermometry																																							
5-2-6 Vibration																																							
<div style="display: flex; justify-content: space-between;"> <div style="width: 45%;"> <p><input type="checkbox"/> : Japanese side</p> <p><input type="checkbox"/> : Thai side</p> </div> <div style="width: 50%;"> <table border="0"> <tr><td>A</td><td>: Advice</td></tr> <tr><td>Doc</td><td>: Documentation</td></tr> <tr><td>Exp</td><td>: Dispatch of expert</td></tr> <tr><td>Conf</td><td>: Confirmation of maintenance management manual</td></tr> <tr><td>IMM</td><td>: Implement of Establishment and Maintaining</td></tr> <tr><td>SS</td><td>: Self study</td></tr> <tr><td>IT</td><td>: Improvement of calibration technology</td></tr> <tr><td>AT</td><td>: Advice, Technical note</td></tr> <tr><td>CCP</td><td>: Confirmation of Calibration Procedure</td></tr> </table> </div> </div>																						A	: Advice	Doc	: Documentation	Exp	: Dispatch of expert	Conf	: Confirmation of maintenance management manual	IMM	: Implement of Establishment and Maintaining	SS	: Self study	IT	: Improvement of calibration technology	AT	: Advice, Technical note	CCP	: Confirmation of Calibration Procedure
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CCP	: Confirmation of Calibration Procedure																																						

8.1

Sekki Byes.



Attachment 5

Technical Cooperation Program, (TCP)

Calendar Year (Thailand)	2001			2002				2003				2004	
Japanese Fiscal Year	II	III	IV	I	II	III	IV	I	II	III	IV	I	II
<b>Term of Technical Cooperation</b>													
<b>1. Acoustics and Vibration</b>													
(1) Acoustics and Vibration													
Establishment of Measurement Standard													
Calibration Technology													
<b>2. Electricity and Magnetism (Low Frequency)</b>													
(1) AC Related Standard													
Establishment of Measurement Standard													
Calibration Technology													
(2) DC High Voltage Standard													
Establishment of Measurement Standard													
Calibration Technology													
<b>2. Electricity and Magnetism (High Frequency)</b>													
(1) Time and Frequency													
Establishment of Measurement Standard													
Calibration Technology													
(2) RF Related Standard													
Establishment of Measurement Standard													
Calibration Technology													
<b>3. Hardness</b>													
(1) Hardness Standard													
Establishment of Measurement Standard													
Calibration Technology													
<b>4. Length Related Standard</b>													
(1) Length Standard													
Establishment of Measurement Standard													
Calibration Technology													
(2) Form													
Establishment of Measurement Standard													
Calibration Technology													
(3) Angle													
Establishment of Measurement Standard													
Calibration Technology													
<b>5. Thermometry</b>													
(1) Thermometry Humidity													
Establishment of Measurement Standard													
Calibration Technology													
(2) Radiation													
Establishment of Measurement Standard													
Calibration Technology													
<b>6. Force Standard</b>													
(1) Force Standard													
Establishment of Measurement Standard													
Calibration Technology													

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Attachment 6

Annual Technical Cooperation Program (ATCP)

Calendar Year	2001			2002						2003		
Japanese Fiscal Year	2001			2002						2003		
	7	8	9	10	11	12	1	2	3	4	5	6
<b>Term of Technical Cooperation</b>												
<b>1 Installation technique of equipment</b>												
1-1 Acoustics and Vibration												
1-2 Time and Frequency												
1-3 Wavelength Standard												
1-4 Form ( Plug/Ring, Roughness, Roundness)												
1-5 Hardness Standard												
[1-6 pH solution standard]												
[1-7 Radiation thermometry]												
[1-8 Vibration]												
<b>2 Commission technique of equipment</b>												
2-1 Acoustics and Vibration												
2-2 Time and Frequency												
2-3 Wavelength Standard												
2-4 Form ( Plug/Ring, Roughness, Roundness)												
2-5 Hardness Standard												
[2-6 pH solution standard]												
[2-7 Radiation thermometry]												
[2-8 Vibration]												
<b>3 Operation technique of equipment</b>												
3-1 Acoustics and Vibration												
3-2 Time and Frequency												
3-3 Wavelength Standard												
3-4 Form ( Plug/Ring, Roughness, Roundness)												
3-5 Hardness Standard												
[3-6 pH solution standard]												
[3-7 Radiation thermometry]												
[3-8 Vibration]												
<b>4 Maintenance method of equipment</b>												
4-1 Acoustics and Vibration												
4-2 Time and Frequency												
4-3 Wavelength Standard												
4-4 Form ( Plug/Ring, Roughness, Roundness)												
4-5 Hardness Standard												
[4-6 pH solution standard]												
[4-7 Radiation thermometry]												
[4-8 Vibration]												
<b>5 Establishment of Measurement Standard</b>												
5-1 Acoustics and Vibration												
5-2 Time and Frequency												
5-3 Wavelength Standard												

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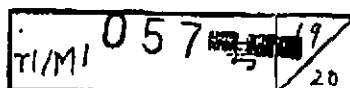
Annual Technical Cooperation Program (ATCP)

5-4 Form ( Plug/Ring, Roughness, Roundness)									
5-5 Hardness Standard									
[5-6 pH solution standard]									
[5-7 Radiation thermometry]									
[5-8 Vibration]									
6 Maintaining of measurement standard.									
6-1 Acoustics and Vibration									
6-2 Time and Frequency									
6-3 Wavelength Standard									
6-4 Form ( Plug/Ring, Roughness, Roundness)									
6-5 Hardness Standard									
[6-6 pH solution standard]									
[6-7 Radiation thermometry]									
[6-8 Vibration]									
7 Calibration Technology									
7-1 Acoustics and Vibration									
7-2 Time and Frequency									
7-3 Wavelength Standard									
7-4 Form ( Plug/Ring, Roughness, Roundness)									
7-5 Hardness Standard									
[7-6 pH solution standard]									
[7-7 Radiation thermometry]									
[7-8 Vibration]									
8 Documentation method of manual									
8-1 Acoustics and Vibration									
8-2 Time and Frequency									
8-3 Wavelength Standard									
8-4 Form ( Plug/Ring, Roughness, Roundness)									
8-5 Hardness Standard									
[8-6 pH solution standard]									
[8-7 Radiation thermometry]									
[8-8 Vibration]									
9 Estimation of Measurement uncertainty									
9-1 Acoustics and Vibration									
9-2 Time and Frequency									
9-3 Wavelength Standard									
9-4 Form ( Plug/Ring, Roughness, Roundness)									
9-5 Hardness Standard									
[9-6 pH solution standard]									
[9-7 Radiation thermometry]									
[9-8 Vibration]									

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*Schmidt*

*Bjbs*



### JAPANESE SHORT-TERM EXPERTS (October, 2002-September, 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, scopes and the terms of reference of the Japanese experts were subject to change due to the recruitment of the respective experts, the progress of the Project and budgetary constraint. In these cases, JICA will inform the Thai side.

No	Scope	Terms of Reference	Duration
1	Acoustics	To confirm the installation and optimal operation of equipment, and to instruct establishment and maintenance technique of national measurement standard, and calibration technique for reference standard.	1 month (from November, 2002)
2	Wavelength		1 month (from March, 2003)
3	Plug/Ring		1 month (from February, 2003)
4	Roundness		1 month (from March, 2003)
5	Roughness		1 month (from March, 2003)
6	Hardness		1 month (from February, 2003)
7	(Radiation)		1 month (from March, 2003)
8	Calibration procedure	To transfer calibration procedure above quantities.	1 month (from May, 2003)
9	Improving the confidence of National Measurement Standards	To cooperate with enhancement of confidence in measurements.	1 week (from December, 2002)
10	Improving the confidence of National Measurement Standards	To cooperate with enhancement of confidence in measurements.	1 week (from December, 2002)

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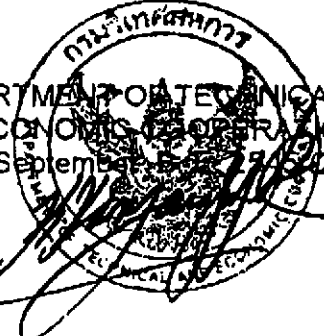
*By 1 S.*

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 : dttec-gov @ inet.co.th Web Site URL http ://www.DTEC.thaigov.net

No. 2112/ 16598

The Department of Technical and Economic Cooperation presents its compliments to the Japan International Cooperation Agency, Thailand Office and, with reference to the JICA's Note No. 1044/14H dated August 27, 2002 concerning the revised Draft of Record of Discussions of the "Project on the Technical Strengthening of National Institute of Metrology (Thailand)" has the honour to inform the JICA that Thai authorities concerned have no objection to the said draft of Record of Discussions.

The Department of Technical and Economic Cooperation avails itself of this opportunity to renew to the Japan International Cooperation Agency, Thailand Office the assurances of its highest consideration.

DEPARTMENT OF TECHNICAL AND ECONOMIC COOPERATION  
19 September 2002  


Japan International Cooperation Agency,  
Thailand Office, Bangkok.

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