No. 003

タイ工業標準化試験研修センター
協力事業実施協議調査団報告書

平成元年12月

国際協力事業団

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タイ工業標準化試験研修センター
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序　文

昭和63年３月に、タイ国政府からの要請により基本設計調査団を派遣することから始まった工業標準化・工業計量試験センターの無償資金協力に対して、さらに同国政府の要請に基づくプロジェクト方式技術協力を実施することで、より一層援助の質を高めることを目指し、本プロジェクトが開始されることになった。今回の実施協議に至るまでには、プロジェクトのフレームワーク作りの為に三回にわたる調査がなされ、その都度各方面の関係者の暖い御協力をいただいた。

本報告書は、これまでの調査結果を踏まえ、実施協議調査団がプロジェクトの実施内容についてR/Dに取り決める間の日・タイ双方の協議内容とその結果をとりまとめたものである。

ここに改めて本プロジェクトの成立に御尽力いただいた日・タイ双方の関係者各位に対し、心より謝意を表する次第である。

平成元年12月

国際協力事業団
理事　小　閑　俊　彦

写真１．建設が進むTISI/TISTRの施設

（ 手前の建物がTISIのセンター）

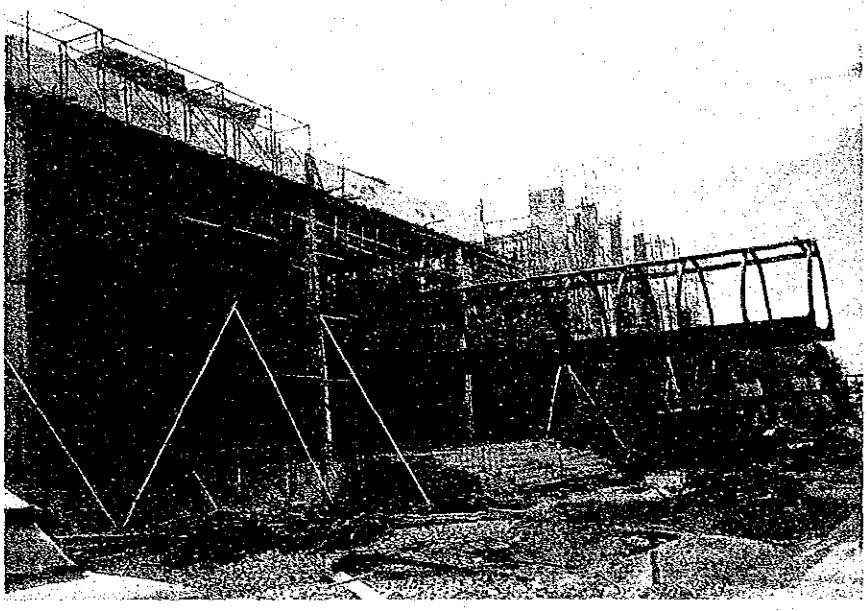

写真２．R/D調印式

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1．実施協議調査団派遣

1－1　調査団派遣の経緯と目的

今回の実施協議調査団の派遣を除いて、本件技協プロジェクトにはこれまで次の各種の調査団が派遣された。

1987年12月　コンタクト調査団

タイ工業標準化・工業計量試験センター建設にかかる無償資金協力事前調査団と合同で派遣。

1988年４月　事前調査団

タイ側要請内容の確認と技術協力の実施可能性について調査。

1989年８月　長期調査員（４名）

技術協力計画策定に必要な詳細調査及び確認。

本調査団は、長期調査の結果を踏まえて、日本側て査定したR/D及び技術協力計画内容に関し、タイ側実施機関であるTISIと協議を重ねた上でR/Dに署名を行なうことを目的とする。

1－2　調査団の構成

（団　　長）	長沢幸敏	国際協力事業団鉱工業開発協力部鉱工業開発技術課
（協力計画）	佐伯俊則	通商産業省工業技術院標準課標準国際規格室
（標準化・品質管理）	山中昭光	山中昭光技術士事務所
（試験技術）	桜井邦夫	(財)機械電子検査検定協会国際事業部
（業務調整）	押山和範	国際協力事業団鉱工業開発協力部鉱工業開発技術課

1－3　日程表

日順	月　日	曜日	業　務　内　容
1	11／27	月	移動（東京→バンコク）
2	11／28	火	JICA事務所及び日本大使館表敬 ・打合せ バンプー内おプロジェクトサイド建設現場視察
3	11／29	水	TISIにてR/D(案)及びTSi(案)の討議
4	11／30	木	TISIにてR/D.TSi 最終案の読み合わせ タイ金属加工機械工業開発振興プロジェクト視察 TISI主催による夕食会
5	12／ 1	金	DTEC表敬 TISIにてR/D及びTSiへの署名 JICA事務所及び日本大使館へ結果報告 調査団主催答礼宴
6	12／ 2	土	資料整理
7	12／ 3	日	帰国(バンコク→東京)

1－4　主要面談者

工業省工業標準局（TISI）

Mr. Samnao Chulkarat	Secretary-General
Mr. Thien Mekanontchai	Deputy Secretary-General
Ms. Kanya Sinsakul	Director, Stamdardization Division
Mr. Somruay Harinasuta	Director, Certification Division
Ms. Phani Na-Rangsi	Senior Expert on Standardization
Mr. Thammachai Chaopreecha	Engineer, Quality Control Sub-Division, Certification Division

在タイ日本大使国館

生田　章一　一等書記官

JICAタイ事務所

斉藤　勉　所長

師岡　俊夫　所員

2. R/D 要約

R/Dは基本的には日本側作成の案に沿った形で合意された。

その要約は次のとおりである。

(1) 名　　称

(英文) Project for the Industrial Standardization, Testing and Training Centre

(2) 協力期間

1989年12月1日～1994年11月30日

(3) 協力機関

TISI (工業省工業標準局)

(4) 協力目的

日本人専門家のカウンターパートがTISIの業務をより効率的、効果的に実施しうるよう技術指導を行い、タイ国におけるTISマーク制度の促進に寄与することを目的とする。

この際、無償資金援助によってTISIに供与された施設、機材を十分に活用するものとする。

(5) 協力範囲

協力の分野としては次の二分野とする。

1) 標準化・品質管理

標準化・品質管理分野では、企業における実際的な知識と技術に重きを置き、技術移転を実施する。また、センターにおいては専門家の指導により、次の業務を開始する。

(研修業務)

Staff Training Course : TISIのカウンターパート以外の職員を対象にしたコース。工業標準化・品質管理に関する一般的な知識と技術の研修。

QC Manager Course:TIS マーク認可工場の品質管理者を対象とし、工場における品質管理運動の推進のための技能を学ぶためのコース。

(カウンセリング・サービス)

企業に対して行う工業標準化・品質管理に関するカウンセリング・サービス。同時にTISI職員の実務経験の蓄積の場と位置づける。

2) 試験・検査

試験・検査分野は、さらに次の四つの部門に分かれる。

電気、電子、機械・材料、化学・材料

ここでは日本の無償資金協力により供与された機材の操作・保守、及び関連業務の技術移転を行う。

(6) 専門家派遣

（長期専門家）

チーフ・アドバイザー	1名
業務調整	1名
標準化・品質管理	2名
電気試験検査	1名
電子試験検査	1名
機械材料試験検査	1名
化学材料試験検査	1名

（短期専門家）

必要に応じて派遣検討する。

(7) カンターパート等

日本人専門家には、それぞれ2名以上のカウンターパートを配置する他に、必要な管理・事務の専門スタッフを配置する。

(8) 研修員受入

初年度、及び最終年度は3名、その他の年度には4名を受入れる（合計17名）。受入れ期間は2～3ケ月。

(9) 機材供与

日・タイ双方で効果的な技術協力の実施に必要と合意され、かつ、無償資金協力により供与された機材を補完すると認められるものを対象とする。

具体的には、必要性に応じてその都度検討する。

3、討議議事録の交渉経緯

3－1　交渉経緯

討議は大きな争点もなく、概ね順調に進展し、当初想定していた日本側R/D案に近い形で合意することができた。多少とも議論の争点となった箇所、及び一部修正を加えた点は次のとおりである。

(試験分野名) R/D. Annex A, 2－(2)

試験部門の4分野の名称をタイ側よりの要望に応え、次のとおり修正した。

	変更前		変更後
a)	Testing for electrical product	⟶	Electrical testing
b)	Testing for electonic product	⟶	Electronic testing
c)	Testing for mechanical product and material	→	Mechanical and material testing
d)	Testing for chemical product and materia	⟶	Chemical and material testing

(免税特許等) R/D. Annex C.

R/D. Annex中に、一般的に含まれていることが多い項目であるが、タイ側より、「これはR/C. The Attached Document II－2. と重複する為、削除することが望ましい。」との指摘があった。検討の結果、ア) 同項目は本来、R/D.のAnnex であるMaster Plan の中に含めるべき性質のものがないこと、イ) タイにおける技術協力プロジェクト実施例は多く、タイ側もこの点において、従来のプロジェクトの例に従うことは確実と見られる、の2つの理由で同項目を削除することで合意した。なお削除対象となった部分の前文は次のとおり。

C. PRIVILEGES, EXEMPTIONS AND BENEFITS

(1) The Government of Kingdom of Thailand will grant exemptions from income tax and charges of any king imposed on the living allowance and others remitted from abroad to the Japanese experts and their families.

(2) The Government of the Kingdom of Thailand will grant exemptions from customs duties in respect of the importation of personal effects by the Japamese exeperts and their families as will as the importation of machinery and equipment relating to their activiries.

(3) The Government of the kingdom of Thailand will Provide medical services and facilities to the Japanese experts and their families.

(供与機材)

技術協力プログラムで供与可能な機材については、無償資金協力プログラムで供与した機材の追補的 (suppulemental)ものであることに加え、日・タイ両政府間で合意を得たものに限定して

いる。これはタイ側で要請を考えている機材は、無償資金協力プログラムの供与実績から漏れた機材ということであることが判断した為、あえて、機材の具体的名称を揚げることを避けたものである。また日本側より、口頭で、本件技協の供与機材予算はごく僅かであることを説明し，タイ側で大きな期待をしない様に牽制した。

（土地・建物・設備）

タイ側が提供すべき土地に、同プロジェクトセンターに加えて、TISI本部が含まれていることに対するタイ側の疑問が表明された。これに対し、チームは日本人専門家のカウンターパートにTISI本部の人間が含まれる場合があることを指摘し、かつ、この表現がTISIにおいて新たなプロジェクト用地を指すのではないことを説明し、原案のままこれを残すことになった。

（合同委員会）

タイ側より、同委員会の委員としてDTECの(Department of Technical & Economic Cooperation) 代表一名を含めて欲しいとの要望を受け、日本側はこれを了承した。

3－2　討議議事録及び暫定実施計画

(討議議事録)

THE RECORD OF DISCUSSIONS
BETWEEN THE JAPANESE IMPLEMENTATION SURVEY TEAM
AND THE AUTHORITIES CONCERNED OF
THE GOVERNMENT OF THE KINGDOM OF THAILAND
ON THE JAPANESE TECHNICAL COOPERATION PROJECT
FOR THE INDUSTRIAL STANDARDIZATION, TESTING AND TRAINING CENTRE

The Japanese Implementation Survey Team (hereinafter referred to as "the Team") organized by the Japan International Cooperation Agency (hereinafter referred to as "JICA") and headed by Mr. Yukitoshi Nagasawa, Director of Technical Cooperation Division, Mining and Industrial Development Cooperation Department, JICA, visited the Kingdom of Thailand from November 27, 1989 to December 3, 1989 for the purpose of working out the details of the technical cooperation programme concerning the Project for the Industrial Standardization, Testing and Training Centre in the Kingdom of Thailand.

During its stay in the Kingdom of Thailand, the Team exchanged views and had a series of discussions with the Thai authorities concerned in respect of the desirable measures to be taken by both Governments for the successful implementation of the above-mentioned Project.

As a result of the discussions, the Team and the Thai authorities concerned agreed to recommend to their respective Governments the matters referred to in the document attached hereto.

Bangkok, December 1, 1989

Mr. Yukitoshi NAGASAWA
Leader,
Implementation Survey Team
Japan International
Cooperation Agency, Japan

Mr. Samnao CHULKARAT
Secretary-General,
Thai Industrial Standards Institute
The Kingdom of Thailand

THE ATTACHED DOCUMENT

I. COOPERATION BETWEEN BOTH GOVERNMENTS

1. The Government of Japan and the Government of the Kingdom of Thailand will cooperate with each other in implementing the Industrial Standardization, Testing and Training Centre Project (hereinafter referred to as "the Project") for the purpose of developing human resources in the fields of industrial standardization, quality control, and various testing skills through the full utilization of the Centre, thus contributing to the adequate industrial development in the Kingdom of Thailand.

2. The Project will be implemented in accordance with the Master Plan which is given in article A of Annex.

II. DESPATCH OF JAPANESE EXPERTS

1. In accordance with the laws and regulations in force in Japan, the Government of Japan will take necessary measures through JICA to provide at its own expense services of the Japanese experts as listed in article B of Annex through the normal procedures under the Colombo Plan Technical Cooperation Scheme.

2. The Japanese experts referred to in 1 above and their families will be granted in the Kingdom of Thailand, the privileges, exemptions and benefits no less favourable than those accorded to experts of third countries working in the Kingdom of Thailand under the Colombo Plan Technical Cooperation Scheme.

III. PROVISION OF MACHINERY AND EQUIPMENT

1. In accordance with the laws and regulations in force in Japan, the Government of Japan will take necessary measures through JICA to provide at its own expense such machinery, equipment and other

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materials (hereinafter referred to as "the Equipment") necessary for the implementation of the Project as listed in article C of Annex through the normal procedures under the Colombo Plan Technical Cooperation Scheme.

2. The Equipment will become the property of the Government of the Kingdom of Thailand upon being delivered c.i.f. to the Thai authorities concerned at the ports and/or airports of disembarkation, and will be utilized exclusively for the implementation of the Project in consultation with the Japanese experts referred to in article B of Annex.

IV. TRAINING OF THAI PERSONNEL IN JAPAN

1. In accordance with the laws and regulations in force in Japan, the Government of Japan will take necessary measures through JICA to receive at its own expense the Thai personnel connected with the Project for technical training in Japan through the normal procedures under the Colombo Plan Technical Cooperation Scheme.

2. The Government of the Kingdom of Thailand 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 for the implementation of the Project.

V. MEASURES TO BE TAKEN BY THE GOVERNMENT OF THE KINGDOM OF THAILAND

1. In accordance with the laws and regulations in force in the Kingdom of Thailand, the Government of the Kingdom of Thailand will take necessary measures to provide at its own expense:

(1) Services of the Thai counterpart personnel and administrative personnel as listed in article D of Annex;

(2) Land, buildings and facilities as listed in article E of Annex;

(3) Supply or replacement of machinery, equipment, instrument, vehicles, tools, spare parts and any other materials necessary

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for the implementation of the Project other than those provided through JICA under III-1 above;

(4) Transportation facilities and travel allowance for the Japanese experts for the official travel within the Kingdom of Thailand;

(5) Suitably furnished accommodations for the Japanese experts and their families.

2. In accordance with the laws and regulations in force in the Kingdom of Thailand, the Government of the Kingdom of Thailand will take necessary measures to meet:

(1) Expenses necessary for the transportation within the Kingdom of Thailand of the articles referred to in III-1 above as well as for the installation, operation and maintenance thereof;

(2) Customs duties, internal taxes and any other charges, imposed in the Kingdom of Thailand on the articles referred to in III-1 above;

(3) All running expenses necessary for the implementation of the Project.

VI. ADMINISTRATION OF THE PROJECT

1. The Secretary-General of the Thai Industrial Standards Institute will bear overall responsibility for the implementation of the Project.

2. The Director of the Industrial Standardization, Testing and Training Centre will be responsible for the administrative, managerial, and technical matters of the Project.

3. The Japanese Chief Advisor will provide necessary recommendation and advice on technical and administrative matters concerning the implementation of the Project to the Secretary-General and the Director of the Centre.

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

5. For the effective and successful implementation of the Project, a Joint Committee will be established with the function and composition as referred to in article F of Annex.

6. The Organization Chart of the Project is shown in article G of Annex.

VII. CLAIMS AGAINST JAPANESE EXPERTS

The Government of the Kingdom of Thailand undertakes to bear claims, if any arises, against the Japanese experts engaged in the Project resulting from, occuring in the course of, or otherwise connected with the discharge of their official functions in the Kingdom of Thailand except for those arising from the willful misconduct or gross negligence of the Japanese experts.

VIII. MUTUAL CONSULTATION

There will be mutual consultation between the two Governments on any major issues arising from, or in connection with this ATTACHED DOCUMENT.

IX. TERM OF COOPERATION

The duration of the technical cooperation for the Project under this ATTACHED DOCUMENT will be five (5) years from December 1, 1989.

MASTER PLAN

A. OBJECTIVE AND SCOPE

1. Objective of the Project

The project aims at developing human resources in the field of industrial standardization through the full utilization of the Industrial Standardization, Testing and Training Centre.

The counterpart personnel of TISI will be provided by the Japanese experts with the technical guidance and advise in the relevant fields of industrial standardization promotion activities of TISI, in order that the counterpart personnel become competent enough to conduct their duties effectively and efficiently, and to contribute to the further improvement of the TISI mark certification system in the Kingdom of Thailand.

2. Scope of the Project

The fields covered by this project and their components are as follows:

(1) Standardization and Quality Control :

The emphasis is placed on the practical knowledge and techniques useful in the company situation and the following activities will be started in the Centre with the guidance by Japanese experts.

TRAINING COURSES:

a) Staff training course :

This course gives TISI staff other than counterpart personnel an opportunity to learn necessary knowledge and skills on standardization and quality control, and enables them to serve for the operational improvement of TIS certification system.

b) QC Manager Course:

This course is given for the QC managers of TIS mark approved factories so as to enable them to propagate the skills and techniques concerning standardization and quality control within their company and to improve the quality of their products.

COUNSELLING SERVICE:

This service is started for the factories in need of advice on standardization and quality control, and also for TISI to store relevant experience within the institution.

(2) Testing

This field covers the interpretation of the standards related to testing activities carried out with the equipment provided to the Centre by the Japanese grant aid programme, and the skills for operational maintenance of the equipment. This field is divided into the following four groups:

a) Electrical testing

b) Electronic testing

c) Mechanical and material testing

d) Chemical and material testing

B. JAPANESE EXPERTS

Fields of the Japanese experts are as follows:

(1) Chief Advisor

(2) Coordinator

(3) Standardization and Quality Control

(4) Electrical Testing

(5) Electronic Testing

(6) Mechanical and Material Testing

(7) Chemical and Material Testing

Note: Short-term experts will be despatched, if necessary arises, for the fields mentioned above and for other related fields. However, the final decision is subject to the availability of the experts and the budgetary constraints on the Japanese side.

C. EQUIPMENT

The equipment that can be provided in this technical cooperation programme for the effective implementation of the project is to be mutually agreed upon by both of the Governments, and is also to be supplemental to the equipment provided under the grant aid programme by the Government of Japan.

D. LIST OF THAI COUNTERPARTS AND ADMINISTRATIVE PERSONNEL

1. Counterpart Personnel to the Japanese experts

The following counterparts will be assigned to each of the Japanese experts.

(1) Secretary-General of TISI/Director of the Centre

(2) Director of the Centre/Chief of Administration section

(3) Necessary number of TISI staff members in the fields of:

Standardization and quality control

Electrical testing

Electronic testing

Mechanical and material testing

Chemical and material testing

2. Administrative Personnel

(1) Administration officers

(2) Clerical staff

(3) Other necessary supporting staff mutually agreed upon

E. LAND, BUILDING AND FACILITIES

(1) Land

Adequate land area will be provided by the Government of the Kingdom of Thailand at the following addresses.

Address of TISI: The Thai Industrial Standards Institute
Rama VI Street, Bangkok 10400
Thailand

Address of the Centre: The Industrial Standardization, Testing and Training Centre
Bangpoo Industrial Estate
Km.34 Sukhumvit Road
Samutprakarn

(2) Building and Facilities

The Centre building and its facilities that are provided under the grant aid programme of the Government of Japan will be exclusively utilized for the purpose of this project.

F. JOINT COMMITTEE

1. Function

The Joint Committee will meet at least once a year and whenever necessity arises, and work;

(1) To give advise on the formulation of Annual Work Plan for the Project in line with the Tentative Schedule of Implementation drawn up under the framework of this Record of Discussions,

(2) To review the overall progress of the technical cooperation programme as well as the achievements of the above-mentioned Annual Work Plan, and

(3) To review and exchange views on major issues arising from or in connection with the technical cooperation programme.

2. Composition

(1) Chairman : Secretary-General of TISI

(2) Members :

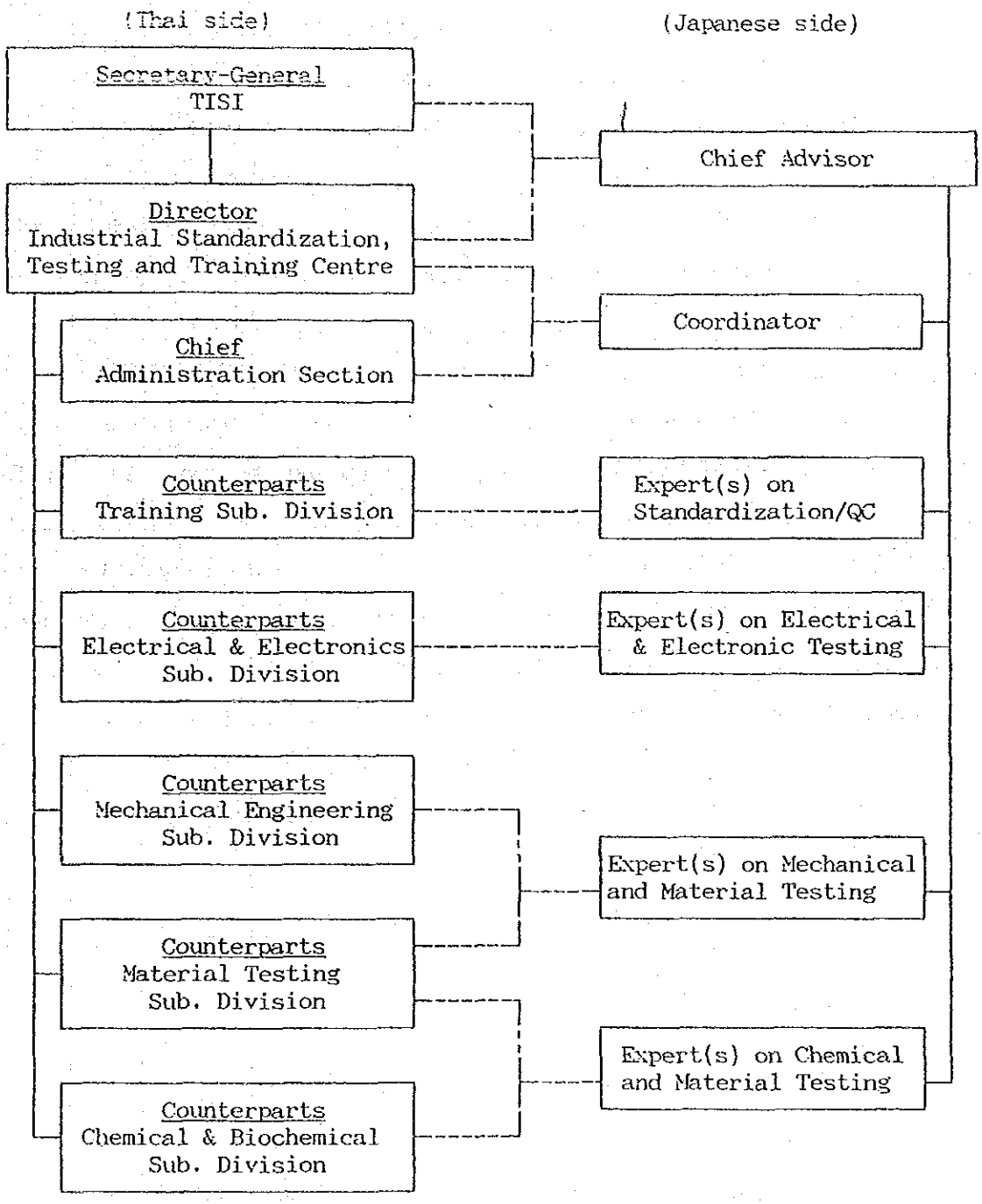
a) Thai side

- Director of the Centre
- Director of Standardization Division
- Director of Certification Division
- Director of Standardization Promotion Division
- Representative of the Department of Technical & Economic Cooperation
- Personnel concerned with the project designated by the Chairman

b) Japanese side

- Chief Advisor
- Coordinator
- The Japanese experts designated by the Chief Advisor
- Representatives of JICA Thailand Office
- Personnel concerned with the project, who is to be sent by JICA, if necessary.

G. PROJECT ORGANIZATION CHART



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(暫定実施計画)

TENTATIVE SCHEDULE OF IMPLEMENTATION

AND TECHNICAL COOPERATION PROGRAMME

FOR THE INDUSTRIAL STANDARDIZATION, TESTING AND TRAINING CENTRE

The Japanese Implementation Survey Team and the representatives of the TISI have jointly formulated the Tentative Schedule of Implementation and the Technical Cooperation Programme of the Project as annexed hereto.

These documents have been formulated in connection with Article I. Paragraph 2 of the Attached Document of the Record of Discussions signed between the Japanese Implementation Survey Team and the Thai authorities concerned, for the Technical Cooperation of the Industrial Standardization, Testing and Training Centre in the Kingdom of Thailand on condition that necessary budget will be allocated for the implementation of the Project, and are subject to change within the framework of the Record of Discussions when necessity arises in the course of implementation of the Project.

Bangkok, December 1, 1989

Mr. Yukitoshi NAGASAWA
Leader,
Implementation Survey Team
Japan International
Cooperation Agency, Japan

Mr. Samnao CHULKARAT
Secretary-General,
Thai Industrial Standards Institute
The Kingdom of Thailand

TENTATIVE SCHEDULE OF IMPLEMENTATION

(CALENDAR YEAR)

	Item	1989	1990	1991	1992	1993	1994	1995
Grant Aid Programme	1. Construction of Building	——	——					
	2. Delivery and Installation of Equipment		——					
Technical Cooperation Programme Duration: Dec.1,1989-Nov.30 1994	1. Phase							
	A. Preparation	——						
	B. Implementation : Basic Establishment		——	——				
	Development				——	——	——	
	Completion						——	
	2. Thai Side							
	A. Submission of A-Form		—	—	—	—	—	
	B. Staff Assignment:							
	Administrative Counterparts (Counterparts for Japanese Chief Advisor and Coordinator)		——	——	——	——	——	- - - -
	Administrative Personnel		——	——	——	——	——	- - - -
	Counterparts for other Japanese experts (No less than two counterparts are to be assigned to each expert.)		——	——	——	——	——	- - - -

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	Item	1989	1990	1991	1992	1993	1994	1995
Technical Cooperation Programme Duration: Dec.1,1989-Nov.30 1994	C. Preparation For the Opening of Centre							
	D. Operation of Centre:							
	Staff Training Course							
	QC Manager Course							
	Counselling Service							
	Testing Activities for:							
	Electrical Testing							
	Electronic Testing							
	Mechanical and Material Testing							
	Chemical and Material Testing							
	3. Japanese Side							
	A. Despatch of Mission	-	-	-	-	-	-	
	B. Despatch of Experts	(Implementation)					(Evaluation)	
	Long-term Experts:							
	Chief Advisor							
	Coordinator							
	Standardization & Quality Control							
	Electrical Testing							
	Electronic Testing							
	Machanical and Material Testing							
	Chemical and Material Testing							

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	Item	1989	1990	1991	1992	1993	1994	1995
Technical Cooperation Duration: Dec.1,1989-Nov.30 1994	Short-term Experts: (To be considered when the necessity arises.) C. Thai Counterparts Training in Japan Field of Training: Management & Administration Standardization & Quality Control Electrical Testing Electronic Testing Mechanical and Material Testing Chemical and Material Testing (Three to four counterparts will be trained in Japan each year for the duration of two to three months.) D. Provision of Suplementary Equipment (Items of the equipment to be provided is subject to the agreement reached between the Japanese and the Thai sides.)	(3)	(4)	(4)	(4)	(3)		

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4．プロジェクト実施上の留意点

4－1　実施体制

(1)　建物・機材設備

本件技術協力は無償資金協力により供与する建物・機材設備を利用して実施することになっている。したがって建物の完成時期、機材設備の据付け時期等に充分な注意を払いつつ、協力を実施して行く必要がある。本件にかかる無償資金協力の概要、及び今後のスケジュールは次のとおりである。

（無償資金協力概要）

フェーズ	内　　訳
第１期分 26.48億円	a)　機材費　　7.89 億円（据付費用込み契約額） TISI分機材CIF 価格　3.64億円 TISTR分機材CIF価格　2.62億円 b)　建設費他　18.62 億円（契約額）
第２期分 １回目 14.19億円	機材費　　14.19 億円（据付費用込み契約額） TISI分機材CIF 価格　7 億円強 TISTR分機材CIF価格　6 億円強
２回目　0.7 億円 （予定）	機材費　　0.7　億円 TISI分機材　（未定） TISTR 分機材（未定）

（今後のスケジュール）

第一期分	1989年12月11日	機材据付関連工事開始
	1990年 2月17日	建築工事完了
	3月30日	建屋、機材施設ハンドオーバー
第二期分	1990年 3月	第１回機材船積（30百万円分）
	7月	第２回　〃　（1,249 百万円分）
	8月	第３回　〃　（50百万円）
	10月	機材一式ハンドオーバー

(2)　同センター・スタッフのリクルート状況

1989年度('88. 10月～'89. 9月）分の同研修センター・スタッフのリクルート状況は、ほぼTISIの当初計画通り進んでいるという報告を受けた。今年12月１日現在で、確保済みとされているスタッフ合計65名。そのうちカウンターパート31名である。分野別の内訳けは次のとおり。

分野　　C/Pの別	ｶｳﾝﾀｰﾊﾟｰﾄ	非ｶｳﾝﾀｰﾊﾟｰﾄ
標準化・品質管理	4 ＋ 1	—
電気試験検査	6 ＋ 1	6
電子試験検査	2	2
機械試験検査	9	12
材料試験検査	5	5
(生)化学試験検査	3	5
管理部門	—	4
合　　計	31	34

なお、タイ側の説明によるとセンター長は今年の12月中にも決定されるということであった。

Staff Planning

(as of Dec. 1. 1989)

Industrial Standardization, Testing and Training Centre | 112

89=58(A=3, E=34, S=7, T=12, TP=2)
90=28(E=14, E/S=6, S=2, T=4, TP=2)
91=20(E=13, S=1, T=6)
92=6 (E=4, T=2)

Director=1+64

Administration Sect. | 7

89=5(A=3, TP=2)
90=2(TP)

1+3

Training Sub.Div | 6

90=6(E/S)

1+3 { CP=4

Electrical & Electronics Sub. Div. | 28

89=15(E=12, T=3)
90=6(E=5, T=1)
91=5(E=4, T=1)
92=2(E)

1+16 { CP=9, ST=8

- **Household Electrical Equip.** | 12
  89=6(E=5, T=1)
  90=3(E=2, T=1)
  91=2(E)
  92=1(E)
  (1+5) CP=3
- **Electrical Component** | 10
  89=5(E=4, T=1)
  90=2(E=2)
  91=2(E=1, T=1)
  92=1(E)
  (1+5) CP=3
- **Audio Equip.** | 5
  89=3(E=2, T=1)
  90=1(E)
  91=1(E)
  (1+3) CP=2

Mechanical Eng. Sub. Div. | 38

89=17(E=12, T=5)
90=9(E=6, T=3)
91=9(E=6, T=3)
92=3(E=2, T=1)

1+20 { CP=9, ST=12

- **Automotive Parts** | 19
  89=6(E=5, T=1)
  90=5(E=4, T=1)
  91=5(E=4, T=1)
  92=3(E=2, T=1)
  (1+7) CP=4
- **Precision Parts** | 5
  89=3(E=2, T=1)
  90=1(E)
  91=1(E)
  (1+3) CP=2
- **Industrial Machine Parts** | 6
  89=4(E=3, T=1)
  90=1(E)
  91=1(E)
  (1+4) CP=2
- **Machine Tool** | 7
  89=3(E=1, T=2)
  90=2(T)
  91=2(T)
  (1+2)

Material Testing Sub. Div. | 17

89=11(E=9, T=2)
90=3(E)
91=3(E=2, T=1)

1+9 { CP=5, ST=5

- **General Testing** | 9
  89=5(E=4, T=1)
  90=2(E)
  91=2(E=1, T=1)
  (1+4) CP=2
- **NDT** | 7
  89=5(E=4, T=1)
  90=1(E)
  91=1(E)
  (1+3) CP=2

Chemical & Biochem. Sub. Div. | 12

89=9(S=7, T=2)
90=2(S)
91=1(S)

1+7 { CP=3, st=5

- **Chem. Anal.** | 6
  89=4(S=3, T=1)
  90=1(S)
  91=1(S)
  (1+3) CP=2
- **Biochem. Anal.** | 5
  89=4(S=3, T=1)
  90=1(S)
  (1+2)

Calibration Sect. | 3

91=2(E=1, T=1)
92=1(T)

KEY
89 = Oct.88-Sept.89
90 = Oct.89-Sept.90
91 = Oct.90-Sept.91
92 = Oct.91-Sept.92
A = Administration Officer
E = Engineer
S = Scientist
T = Technician
TP = Typist

Div. \ Status	Counterpart (CP)	Staff (ST)
STD & QC	4 +1	-
Electrical	6 +1	6
Electronics	2	2
Mech	9	12
Mab	5	5
Chem	3	5
Abm	-	4
Total	31	34

4－2　実施計画

(1)　専門家非派遣計画

長期専門家の派遣時期は、現在建設中のセンター完成後、正式にタイ側に引き渡されることになる来年3月末日以後の派遣となる。具体的には、チーフ・アドバイザー、調整員、標準化・品質管理分野の専門家については5月の下旬を目途に、試験検査分野の専門家については7月～9月の間に派遣することを目途に派遣準備を進める旨、口頭にてタイ側に説明した。

ここで留意すべきことは、試験検査専門家（任期：約1年半）の派遣時期の決定に際し、無償資金協力の供与機材据付けの進捗状況を、よく把握しておくことである。但し、機材据付け時に技協の専門家が派遣されていることが好ましいか否かは、タイ側とチーフアドバイザーの判断を待つことになる。

(2)　試験検査業務の開始時期

タイ側は1991年の年明けより、本格的に試験業務を開始したいと強く希望している。調査団の見解としては、第2期機材の引き渡しが10月頃になることから、年明け早々の業務開始には無理があることを示した。しかしタイ側としては、できる部門から順次開始することを切望している。その為、できるだけ早い時期からOJT方式で、専門家によるカウンターパートへの技術指導を始めることを望んでいる。

調査団としては、タイ側の要望に沿って努力する旨表明したが、日本側は前期(1)のところで述べた供与機材の据付け時期との関連の他に、据付け完了機材の正式引渡し以前に、機材を使用することが可能か否かの点について関係機関に確認することが必要となろう。

5．その他の特記事項

(1) プロジェクト名称変更

同プロジェクトの日本語の名称は、これまで無償賃金協力事業における呼称を踏襲してきた。しかしプロジェクトの内容を正しく表現する為にも、名称を変更するのが望ましく、今回の実施協議調査団帰国報告の場で、関係者の同意を得て次の様に名称変更することとなった。

（新名称）　工業標準化試験研修センター協力事業

（旧名称）　工業品検査・規格センター協力事業

(2) 無償資金協力事業との関係

今年度当初、基本設計時に計画していた無償の機材のうち、約一億円相当分の機材が第２期分の無償の機材から落ちてしまうことが確実視された。その為、タイ側の当該技協のフレームワークの中で落ちた機材について、新たに要請してくることが充分に予想された。その為R/D調印の際は、供与機材については相手側が過大な期待を抱かない様に、「無償の機材を補完するもの、かつ、両国でその必要性に合意を見たものであること。」という制約を設けた。

(3) TISTRとの関連

無償援助においては、TISIとTISTR の２つの機関が対象となっていた。しかし、本技協プロジェクトではTISIのみを協力対象としている。このことに対する将来のTISTR 側の不満が日本側関係者の一部で危惧されている。タイ事務所としてはミニプロジェクトとして取り上げ、日本側の積極的援助姿勢を示すことができればよいと考えているが、実際に大使館でまとめられた調査ではそのプライオリティは２番目となっており、実現の可能性は低いのが現状である。今後のTISIのプロジェクト進捗とともに、TISTR の動きにも若干の注意を払う必要がある。

付 属 資 料

1．長期調査結果要旨

2．プロジェクト概要

3．無償機材リスト

資料　1

長期調査結果要旨

1．TISIの役割と任務

(1)　役割は次のとおり。

①　規格の準備及び公布

②　認証業務の実施

(2)　任務は次のとおり。

①　国家標準化：規格開発、認証、製品試験、品質管理、受託試験、情報サービス、普及広報

②　国際標準化：関係国際機関の種々のフォーラムの参加

2．工業品検査・規格センターの概要

(1)　目　　的

認証業務と品質管理を含めた工業標準化の促進。

(2)　活動内容

①　認証規格・工業規格の作成及び認証業務にための試験業務及び一般への試験サービス。

②　要員の訓練・養成。

③　技術相談業務。

④　品質管理の促進。

⑤　技術情報サービス。

⑥　試験方法、機器の研究開発。

⑦　試験・標準化・品質管理に関するASEAN諸国との調整及び協力。

(3)　TISI内におけるセンターの位置付け

新設の組織で、部レベルとすることで内閣の承認を求めている。

センター所長はP.C.8のレベルとなる予定。

3．センターとTISIの既存部局との関係

センターとTISIの既存部局との関係は以下のとおりであり、重視するものではない。

(1)　標準部・認証部の業務とセンターの試験業務との関係

TISIの試験業務は、従来外部に委託していた純粋な技術的は試験実施の部門に限定される。既存部門は従来通りの業務を実施する。

(2)　標準化振興部とセンターとの関係

センターは、政府関係局スタッフ及び民間企業スタッフに対して具体的な技術・知識を訓練・普及する。

標準化振興部は、標準化の意義・重要性を普及・広報する。

4．センターとTISI既存部局との連絡・調整の方法

センターはTISIの下に部レベルの組織として新設されるものであり、またセンター所長のレベルも他の既存部の長と同様P.C. 8となる予定であるため、部局間の調整等で問題は生じない。

業務の所握についても、前述のとおり他の既存の部局と異なる部分を相当するため、重複等の問題は生じない。

5．　センターと外部検査機関との試験業務の調整

センターでの試験実施が優先される。センターの業務量が過多の場合、あるいは試験項目がセンターだけでは対応できない場合は、他の検査機関に試験を委託する。この場合においても、サレプルが2分割できる場合は、センターで可能な部分はセンターで試験を実施する。

6．技術協力の目的・範囲・期間

(1) 標準化・品質管理

① 目的：以下の点について業務協力を実施することにより、カウンターパートの能力の向上を図ると共に、関連業務に携わる政府職員及び民間企業の担当者の能力向上を図る。

・認証制度における品質管理のレベルアップを目的きしたTISI職員の訓練実施。

・カウンターパートの企業カウンセリング業務実施に関する指導の実施。

・民間企業の品質管理担当者に対する訓練の実施。

② 範囲：標準化については社内の標準化の知識の移転を中心とする。国家標準についてはリーダーが助言を行うにとどめる。

社内標準化と品質管理とは相互補完的な関係にあることから、協力の分野としては、標準化・品質管理に一本化する。

(2) 試　　験

① 目的：センターで実施する試験業務をカウンターパートが自律的に実施できるよう技術指導を行う。

② 範囲：センターに供与された機材の範囲内で、与えられた試験関連規格を解釈し、適切な試験方法を準備する知識及び機材の操作・維持方法について指導する。分野は電気・電子、機械、化学である。

(3) 期　　間

期間は5年間。協力開始時期は、R/D署名後の適当な時期とする。

7.　カウンターパートの配置計画

① 合計配置数は22名。うち20名については予算承認済み。

② 1専門家に最低2名を配置する。

③ これらの者は他の部署から配置換えされる実務経験者である。

8. 予算計画

プロジェクトの重要性が内閣により承認されているため、予算面では問題を生じることはない。

9. そ の 他

(1) Joint Steering Committeeの設置

メンバーは次のとおり。

（タイ側）TISI局(次)長　　委員長

センター所長

DTEC担当者

（日本側）リーダー

調整員

JICAタイ事務所担当者

委員会開催時の出席は必要に応じて決定する。

必要に応じてワーキング・グループを設置する。

(2) 機　材

タイ側から、無償機材を有効稼働させるための機材が必要であり、それは補完的機材と理解してよいかとの質問あり、我が方は具体的な機材名を示すようタイ側に求めた。

資料　2

＜タイ王国＞　　（日付：89. 7. 1　現在）

工業品検査・規格センター
(Industrial Testing and Standardization Center)

1．R／D等署名日　：

2．協力期間　：

3．所在地　：サムットプラーカーン県　バンプー工業団地

4．先方関係機関　：工業省工業標準局（TISI：Thai Industrial Standards Institute, Ministry of Industry)

5．我が方協力機関　：通商産業省、（財）日本規格協会、（財）機械電子検査検定協会

6．要請の背景　：タイ国では、経済社会の発展を目指して工業化を推進しているが、この工業化推進策は原料、資本財等の輸入増を招き、タイは慢性的な貿易収支の赤字に悩むこととなった。このためタイ政府は、工業品の輸出振興を図っているが、輸出促進には品質向上による国際競争力の強化が不可欠であり、工業規格及び認証制度の振興、検査能力の強化の必要性が強く認識されるに至った。
このような状況からタイ政府は、上記に関する業務を担当しているTISIの機能強化のため、日本政府に対して技術協力を要請してきた。

7．目的・内容　：TISIの行っている工業標準化及び認証業務とそれに伴う検査業務に対して技術協力を実施することにより、工業製品の品質管理を強化し、それらの品質向上を図ることを通じて、輸出の振興を目指す。

8．現状・目標達成　：1987年12月にコンタクト調査団、1988年 4月に事前調査団をそれぞれ派遣し、相手側関係機関との間で協力内容に関して協議を行った。本年 8月には長期調査員を派遣し、年度後半には実施協議調査団を派遣することになっている。

9．問題点　：

10．対処方針

11．専門家派遣
研修員
機材供与
ローカル・コスト負担（L・C）

年　度	～84	85	86	87	88	合　計	89
長　期 短　期							
研修員							
機　材							
L・C							

（注）専門家・研修員は延人員、機材は金額で単位百万円。

12．他の経済協力と関係（無償・有償・個別専門家派遣・その他）
：無償資金協力（建物・機材）

13．評価　：

14．調査団　：1)コンタクト　87.12.16～12.25
2)事前調査　88. 4. 5～ 4.12
3)実施協議
4)計画打合
5)巡回指導
6)エヴァリュエーション

15．国内支援　：

資料 3

第1期分機材リスト

LIST OF EQUIPMENT

- EQUIPMENT WORK -

(TiSi分機材)

- The Industrial Standardization, Testing and Training Centre

EQUIPMENT	QUANTITY	CIF PRICE (Japanese Thousand Yen)
Electronic balance	1	121
Balance table	1	123
Top load balance	1	262
Balance table	1	123
Universal tensile testing machine	1	15,226
Autograph	1	18,292
Tension test device for use in thermostatic chamber	1	included Autograph 18,292
Thermostatic chamber	1	included Autograph 18,292
Pendulum impact tester	1	1,300
Hardness tester (Vickers)	1	3,077
Hardness tester (Brinell)	1	1,003
Hardness tester (Rockwell)	1	605
Leaf spring testing machine	1	16,502
Automatic spring testing machine	1	15,918
Digital system coil spring testing machine	1	4,245
Digital system coil spring testing machine	1	1,910
Calorimeter room	1	130,670
Air delivery testing room	1	1,183
Air delivery testing room	1	2,366
Alternator tester	1 set	10,310
Temperature/humidity oven	1	15,105
High-low temperature and humidity chamber	1	2,688
Light projection test apparatus	1	663
Light stability test apparatus	1	121
Optical deviation test equipment	1	121
Distortion of vision test apparatus	1	482
Uniformity test appratus	1	362
Anechoic room	1	46,635

- The Industrial Standardization, Testing and Training Centre

EQUIPMENT	QUANTITY	CIF PRICE (Japanese Thousand Yen)
Balancing machine for tyre and wheel	1	1,605
Endurance tester for tyre and wheel	1	26,758
Bead unseating fixture	1	1,070
Fume hood	1	2,917
Table center	4	4,983
Table side	5	1,009
Sink	2	489
Cabinet	4	993
Storage cabinet	2	520
Balance table	1	301
Universal thread-cutting lathe	1	3,200
Universal milling machine	1	5,925
Cylindrical grinder	1	5,925
Universal tool milling and boring machine	1	4,690
Precision surface grinder	1	2,845
Welding machine	1	355
Soldering equipment	1	62
Electric saw	1	273
Poilishing machine	1	563
Molding	1	563
Overhead crane	1	5,810
Forklift	1	1,435
Jack	1	113
Punching press (bar-shaped)	1	225
Circle cutter	1	317
Weight for weighing	1	504
Load calibration device for tensile testing machine	1	1,591
Sub Total		364,454

LIST OF EQUIPMENT

- EQUIPMENT WORK -

(TiSTR分機材)

- The Industrial Metrology Testing Service Centre

EQUIPMENT	QUANTITY	CIF PRICE (Japanese Thousand Yen)
Universal tensile testing machine	1	14,950
Hardness tester (Vickers)	1	1,720
Hardness standard block for hardness testing (Rockwell)	1	219
Hardness standard block for hardness testing (Vickers)	1	298
Hardness standard block for hardness testing (Brinell)	1	142
Torsional testing machine	1	28,525
Microhardness tester (Vickers) w/knoop identition	1	2,709
Light projection test apparatus	1	4,321
Light stability test apparatus	1	included Light
Optical deviation test apparatus	1	projection test
Distortion of vision test apparatus	1	apparatus 4,321
Uniformity test apparatus	1	
Fume hood	1	1,481
Table	3	593
Table	2	included table 593
Sink	1	182
Cabinet	1	182
Storage cabinet	1	194
Balance table	1	205
Table center	1	912
Table side	1	148
Fume hood	1	1,481
Table	1	353
Table	2	included Table 353
Sink	1	182
Cabinet	1	182
Electron microscope	1	67,934
Deep freezer	1	194
Fume hood	1	2,245

- The Industrial Metrology Testing Service Centre

EQUIPMENT	QUANTITY	CIF PRICE (Japanese Thousand Yen)
Fume hood	1	2,187
Table center	4	3,634
Table	1	114
Table side	1	240
Sink	1	182
Cabinet	2	365
Storage cabinet	2	376
Balance table	1	216
Table side	5	752
Fume hood	1	2,187
Table center	1	911
Table side	1	240
Table side	1	240
Sink	1	182
Cabinet	1	182
Cabinet	1	182
Storage cabinet	1	194
Storage cabinet	1	194
Fume hood	1	2,187
Table center	1	911
Working table	1	753
Sink	1	182
Cabinet	1	182
Storage cabinet	1	194
Storage cabinet	1	194
GC/FTIR/MS	1	23,130
Table side	1	160
Table side	4	604
Table side	2	308
Temperature/humidity oven	1	9,260
High-low temperature and humidity chamber	1	2,814
Lathe	1	3,240
Universal milling machine	1	6,000
Cylindrical grinder	1	6,000

- The Industrial Metrology Testing Service Centre

EQUIPMENT	QUANTITY	CIF PRICE (Japanese Thousand Yen)
Drilling and boring machine	1	3,240
Welding machine	1	309
Automatic bandsaw	1	276
Hydraulic press	1	7,404
Forklift truck	1	1,445
Direct reading balance	1	1,585
Standard platform balance	1	3,390
Anechoic room	1	46,387
Sub Total		262,075
Total		626,529

第２期（１回目）機材リスト

LIST OF EQUIPMENT

(TiSi分機材)

EQUIPMENT	QTY	CIF PRICE (In Japanese Thousand Yen)
A. MECHANICAL (TISI)		
Steel long tape	4	¥17
Steel ruler	10	18
Vernier caliper	29	590
Linear height	1	1,529
Digimatic caliper	2	33
Vernier microscope	2	6
Toolmakers microscope	1	784
Monitor TV set	1	386
A-counter	1	108
Poraloid photograhic attachment	1	196
Digimatic head	2	114
Micrometer	10	33
Digital bench micrometer	2	76
Outside micrometer	19	202
Tubular inside micrometer	9	¥66
Micrometer stand	2	5
Groove micrometer	1	17
Dial indicator	10	53

EQUIPMENT	QTY	CIF PRICE (In Japanese Thousand Yen)
Magnetic stand	10	¥74
Layout machine	1	30,558
Roundness measuring machine	1	2,966
Digital roughness tester	1	1,223
Granite table	3	603
H, V-block	2	103
Transfer stand	1	20
Magnetic chuck	5	378
Thread gauge	10	1,506
Schopper type thickness gauge	1	80
Radius gauge	1	1
Dial snap gauge	1 set	113
Filler gauge	1	¥1
Metallurgical microscope	1	518
Universal bevel protractor	1	17
Profile projector	1	1,209
Protractor screen	1	
Cross travel stage	1	
Overlay chart	1	
Hygrometer	3	1,498
Thermo-hydrometer	1	812
Automatic densimeter	1	1,208
Multi-layer coating thickness analyzer	1	277

EQUIPMENT	QTY	CIF PRICE (In Japanese Thousand Yen)
Specimen punching press	1	¥1,983
Tension gauge	1	88
Desiccator	1	204
Drop tester	1	3,205
Pendulum impact tester	1	1,477
Hardness tester	1	372
Compression test apparatus	1	231
Hydraulic test press	1	1,682
Torque wrench	6	550
Torque meter	10	787
Creep testing machine (Bending tester)	1	4,668
Vibro tester	1	15,793
Vibro measuring instrument	1	547
Friction testng machine	1	5,186
Abrasion resistance tester	1	2,804

EQUIPMENT	QTY	CIF PRICE (In Japanese Thousand Yen)
Standard head form	1	¥3,283
Shock absorption test equipment for helmet	1	4,656
Penetration test equipment	1	2,966
Endurance tester for head rest	1	28,549
Seat frame testing machine	1	15,560
Diameter porosity meter	1	280
V-belt length measurement stand	1	8,868
Cylinder for flexibility test	1	¥701
Fasten belt strength test equipment	1	3,992
X-ray projector	1	4,198
Ultrasonic flaw detector	1	1,402
Angle probe	6	230
Straight probe	2	144
Standard test block set	13	234
Crack inspection equipment	1	2,399
Densitometer	1	42
Shaukasten (Film viewer)	1	56
Sub-Total:		¥164,547

EQUIPMENT	QTY	CIF PRICE (In Japanese Thousand Yen)
B. ELECTRO-MECHANICAL (TISI)		
Anemometer with tripod	2	¥90
Heating efficiency test stand	1	449
Mechanical endurance test for speed regulator (rotary type)	1	3,271
Mechanical endurance test for speed regulator (Push type)	1	2,804
Tachometer (Non-contact type)	2	69
Tachometer (Contact type)	2	81
Endurance test equipment for ignition coil	1	2,009
Performance test equipment for starter motor	1	3,271
Endurance test equipment for SW mag. assembly	1	2,719
Durability test equipment for wiper motor	1	2,897
Sub-Total:		¥17,660
C. ELECTRICAL (TISI)		
Portable watt meter	4	¥265
Digital watt meter	3	667
Watt meter	1	126
Watt-hour meter	5	530
Recorder for watt-hour meter	5	497
Digital power factor meter	2	492
Portable AC voltmeter	13	370

EQUIPMENT	QTY	CIF PRICE (In Japanese Thousand Yen)
Electro-static voltmeter	1	Y83
Portable DC voltmeter	5	137
Portable DC volt am-meter	2	99
Portable AC volt am-meter	4	218
Portable AC am-meter	20	597
Portable DC am-meter	15	357
Thermo-couple type am-meter	1	Y105
Thermo-couple type milli am-meter	2	210
Thermo-couple type voltmeter	2	205
Thermo-couple for mill am-meter	3	41
Digital AC meter	4	5,186
Preision digital multimeter	2	1,341
Digital multimeter	2	127
Clamp multimeter	1	7
Digital circuit tester	5	60
Capacitance meter	1	549
Precision wheastone bridge	1	282
Precision double bridge	1	394
Electronic galvanometer	1	230

EQUIPMENT	QTY	CIF PRICE (In Japanese Thousand Yen)
Decade resistance box (Low Z)	4	Y655
Decade resistance box (High Z)	4	1,064
Resistance for discharge test	1	327
Slide Resistor	2	54
Switch resistance tester (contact resistance tester)	2	431
Shunt resister	2	2
Oscilloscope with probe	3	763
Storage oscilloscope	1	521
Frequency meter	4	169
Line counter	10	187
Time sequencer	5	1,121
Timer	10	187
Timer	10	Y187
Precise stop clock	5	117
Digital stroboscope	2	430

EQUIPMENT	QTY	CIF PRICE (In Japanese Thousand Yen)
Digital thermometer with analog output	2	¥683
30-point selector for digital thermometer	2	238
Thermo-couple (Sheath)	60	1,513
Thermo-couple (Coil)	1	141
Hybrid recorder	2	1,529
Hybrid recorder	6	4,147
Temperature controller	2	136
Pocket thermometer	5	199
Pocket thermometer	5	218
Temperature probe	5	95
Thermo-couple	15	234
Rod type glass thermometer	6	¥135
Flat bed recorder	4	1,654
X-Y recorder	6	2,478
AC single phase voltage regulator	6	2,621
AC three phase voltage regulator	1	1,325
DC power supply	3	
DC power supply source	1	329

EQUIPMENT	QTY	CIF PRICE (In Japanese Thousand Yen)
DC power supply source	5	¥322
DC power supply source	1	1,352
Variable AC source	3	3,701
Variable power supply	1	1,629
High voltage testing device	1	8,878
High voltage power supply	1	¥187
Fuse testering jig	2	224
Step-up transformer	1	374
Step-down transformer	2	164
Insulation transformer	10	49
Current transformer	10	634
Filament heating transformer	1	280
Volt slider	14	444
Mega-ohm tester	2	44
Insulation & breakdown tester	5	785
Insulation resistance meter	4	1,656
High frequency breakdown tester	1	781
Spark tester with drum	1	1,869
Tracking resistance tester	1	1,234
Arc resistance tester	1	1,398

EQUIPMENT	QTY	CIF PRICE (In Japanese Thousand Yen)
Leakage current tester	4	¥516
Earth continuity tester	2	262
Safety test tool kit	1	837
Safety test tool kit	1	684
Standard plug for dimension testing	1	12,449
Special cap for twist test for lamp	1	377
Mandrels for wrapping test	1	280
Enamel wire testing pencil lead scratch	1	748
Cabcyre cord flexing tester	1	4,156
Cord bending fatigue tester	1	1,402
Triple parallel plate plastometer	1	1,885
Tumbling barrel	1	486
Test table for heating test	1	56
Hot mandrel heat resistrane tester	1	2,273
V-belt electrical resistance measurement stand	1	¥383

EQUIPMENT	QTY	CIF PRICE (In Japanese Thousand Yen)
Battery tester	1	¥9,468
Short circuit tester	1	
High rate tester	1	
Automatic capacity tester	1	
Automatic battery life tester	1	
B.Q. tester	1	1,121
Sub-Total:		¥100,433

D. FLUID PRESSURE (TISI)

High pressure water pump with pressure gauge	1	¥706
Air pump/pressure gauge	1	4,150
Water jacket cylinder with expansion gauge	1	12,317
Air leak tester	1	2,430
Air leakage test equipment for spark plug	1	2,056
Sub-Total:		¥21,659

E. THERMAL (TISI)

Temperature oven	3	¥2,389
Gear type oven	1	1,028
Oil bath with constant temperature device	2	301
Oil bath	2	1,589

EQUIPMENT	QTY	CIF PRICE (In Japanese Thousand Yen)
Water bath with thermal control,	1	Y3,112
Flammability tester with draft chamber	1	2,042
Muffle furnace	1	305
Rain test system	1	5,154
Dilatometer	1	6,334
Sub-Total:		Y22,254

F. CLIMATIC (TISI)

Water sprayig chamber	1	Y8,299
ozone againg tester	1	2,593
Dust chamber	1	6,224
Salt spray tester	1	1,607
Sub-Total:		Y18,723

G. LIGHT AND SOUND (TISI)

Flux meter	1	Y91
Lux meter	1	29
Photometric integrating sphere 2m dia. with photo receiver	1	29,325
Photometric bench 3.5m length with photo receiver	1	10,195
Digital illumination meter	1	396
Colorimetry set	1	18,391

EQUIPMENT	QTY	CIF PRICE (In Japanese Thousand Yen)
Lamp chamber tester with lamp holder	1	Y1,355
Life test rack for incandescent lamp	1	1,766
Life test rack for fluorescent lamp	1	5,738
Testing circuit for fluorescent lamp	1	2,383
Testing circuit for incandescent lamp	1	168
Microphone (1-inch)	2	480
Microphone (1/2-inch)	2	234
Pre-amplifier	2	321
Microphone cable	6	144
		189
		113
Measuring amplifier	1	1,965
Sine wave generator	1	1,533
level recorder	1	2,850
Band pass filter	1	Y1,508
Power amplifier	1	420
Sound level meter	4	2,296
Level recorder	2	692
Piston phone	1	215
Sub-Total:		82,797

EQUIPMENT	QTY	CIF PRICE (In Japanese Thousand Yen)
I. CHEMICAL (TUSI)		
Atomic absorption spectrometer	1	Y10,373
X-ray spectrophotometer	1	51,930
Inductive coupled plasma spec.	1	27,820
UV-VIS spectroptohometer	1	2,263
Shaker with separatory funnel holder	1	250
Balance	1	314
Hot plate	1	104
Auto still	1	529
Oven	1	251
Water bath	1	58
Muffle furnace	1	415
Sub-Total:		Y94,307
J. WORK SHOP (TISI)		
Strip cutter	1	Y248
Sub-Total:		Y248
L. ELECTRONICS		
AM/FM signal generator	2	Y1,479
Stereo signal generator	1	369
Audio signal generator	2	495
Function generator	1	233

EQUIPMENT	QTY	CIF PRICE (In Japanese Thousand Yen)
Electronic voltmeter	5	Y512
Frequency counter	2	99
Audio analyzer	2	2,150
Wow and flutter meter	2	230
Oscilloscope	1	509
DC power supply	4	353
Field strength meter	1	492
FM detector	1	689
Shield room with line filter	1	2,074
Dummy antenna	1	61
Sub-Total:		Y9,745
M. CALIBRATION (TISI)		
Block gauge for dimension measurement	1	260
Hardness standard block for hardness testing (Rockwell)	1	164
Hardness standard block for hardness testing (Vickers)	1	101
Hardness standard block for hardness testing (Brinell)	1	86
AC volt-ammeter	1	54
Thermo couple type milli-am-meter	3	315
Precision wheatstone bridge	1	282
Electronic galvanometer	1	241
Precision double bridge	1	444

EQUIPMENT	QTY	CIF PRICE (In Japanese Thousand Yen)
Decade resistance box	1	¥164
DC voltage/current standard	1	221
AC voltage/current standard	1	874
Rod type glass thermometer	1	118
Sub-Total:		¥3,324
STANDARDIZATION, FURNITURE, OTHERS (TISI)		
Testing table	30	¥3,434
Testing table with out-let	15	1,417
Chair for testing table	45	2,727
Sub-Total:		¥7,578
Typewriter	1	¥70
Copy machine	1	649
Sub-Total:		¥719
Computer	2	¥2,256
External diskette drive	2	
Printer	2	
Stencil copying machine	1	1,566
Copy machine	1	649
Work table	2	96
Facsimile	1	543
Sub-Total:		¥5,110

EQUIPMENT	QTY	CIF PRICE (In Japanese Thousand Yen)
S. [Training materials]		
Audio Visual Aids (Slide)	12	¥561
Statistical simulators kit	15	1,869
Statistics and quality control exercise kit	15	
Isocahedron (20 faces) dice.	15	
QC template	15	
Color standard charts	3	
Scales for color fastness test	3	
Sub-Total:		¥2,430
U. [Vehicle]		
Medium bus for practical training	1	¥4,219
Wagon for factory survey	1	2,103
Pick up truck for roving	1	2,196
Sub-Total:		¥8,518
Desk for Trainee	16	¥510
Chair for Trainee	32	326
Desk for Teacher	2	57
Chair for Teacher	2	23
Blackboard	2	54

EQUIPMENT	QTY	CIF PRICE (In Japanese Thousand Yen)
Desk for Trainee	16	¥510
Chair for Trainee	32	326
Desk for Teacher	2	57
Chair for Teacher	2	23
Blackboard	2	54
Desk for Trainee	8	255
Chair for Trainee	16	163
Desk for Teacher	1	¥28
Chair for Teacher	1	11
Blackboard	1	27
Sub-Total:		¥2,424
Table	17	¥629
Chair	50	1,614
Sub-Total:		¥2,243
Battery adapter	1	¥58
Battery shoe	1	9
Condenser microphone	1	74

EQUIPMENT	QTY	CIF PRICE (In Japanese Thousand Yen)
Camera mic holder	1	¥11
Battery for microphone	20	7
Tripod with dolly	1	157
Carrying bag	1	56
Portable video cassette recorder	1	942
Battery charger	1	78
Rechargeable battery pack	20	11
Portable battery light	1	174
Lamp	10	460
Carrying cart	1	73
Mic extension cable	1	7
Camera cable	1	34
Mic extension cable	1	4
Dubbing connector cable	1	¥5
Audio cable	1	7
Dynamic mic	1	49
Carrying handle	1	8
AC power adapter	1	82
Color video monitor	1	153
3-chip CCD video camera	1	1,357
5-inch monochrome electronic viewfinder	1	228

EQUIPMENT	QTY	CIF PRICE (In Japanese Thousand Yen)
Flexible cable unit	1	¥157
Tripod with dolly	1	392
Camera cable	1	50
Camera control unit	1	269
AC power adapter	1	82
4-inch monochrome electronic viewfinder	1	94
Rack mount metal	1	¥20
AC power supply unit	1	112
Camera control console	1	292
A/V cable	1	224
Main power switcher	1	224
Color video monitor	1	239
Compact monitor speaker system	1	15
Monitor stand	1	90
Dynamic mic without cable	1	49
Microphone boom stand	1	24
Mic extension cable	2	15
Electret condenser mic.	1	60
Electret condenser mic.	1	38
Table microphone stand	1	7
Cradle suspension	1	15
Portable lighting kit	1	341
Lamp	1	46
Lamp	1	73

EQUIPMENT	QTY	CIF PRICE (In Japanese Thousand Yen)
B/W video camera	1	¥112
AC adapter	1	29
Monochrome video monitor	1	75
Manual zoom lens	1	70
Close up lens	1	4
Stand console	1	163
Special effect generator	1	1,144
Connecting cable	7	13
Intercomm	4	67
Color video monitor	2	303
Video/Audio selector	2	87
Video/audio distributor	1	112
Console	1	157
U-matic video cassette recorder/editing	1	1,514
Rack mount metal	2	88
U-macic video cassette recorder	1	953
Automatic editing control	1	260
Color video monitor	2	¥303
Monitor connecting cable	2	8
Remote control cable	2	36
Dubbing connecting cable	1	7
Time base corrector	1	785

EQUIPMENT	QTY	CIF PRICE (In Japanese Thousand Yen)
Cable	1	Y224
Console box	1	583
Professional 8-ch audio mixer	1	323
Stereo headphone	1	17
Cassette tape deck	1	95
Rack mount adapter	1	168
Compact disk player	1	57
Compact monitor speaker	2	151
Amplifier	1	168
Audio console	1	292
Genlocker	1	990
PAL videotizer	1	660
PAL superrimposer	1	353
Cache disk unit	1	Y219
PAL video titler (English)	1	89
Graphic editor	1	68
Q-manager	1	93
Disk basic	1	33
Color video monitor	1	212
Micro floppy disk	5	76
System console	1	155
Cable	1	224
U-matic video cassete tape	15	84
U-matic video cassette tape	15	168

EQUIPMENT	QTY	CIF PRICE (In Japanese Thousand Yen)
VHS Video Cassette Tape	25	Y53
Video Cassette tape	25	53
Low noise audio cassette tape	25	11
Dynamic mic	1	49
Microphone boom stand	1	24
Mic extension cable	2	Y15
Speaker System	1	76
Mounting bracket	2	19
Control power amplifer	1	253
Cassette tape deck	1	95
Compact disk player	1	57
Console rack	1	336
Cable	1	280
Main power switcher	1	112
VTR	1	256
VTR	1	176
Color TV receiver	1	235
Console rack	1	224
Universal video projector	1	1,253
Flat screen	1	129
Suspension support	1	49

EQUIPMENT	QTY	CIF PRICE (In Japanese Thousand Yen)
Suspension support	1	Y76
Camera extension cable	1	50
Remoce control unit	1	90
VTR	1	256
VTR	1	176
Control power amplifier	1	253
Speaker system	2	151
Speaker stand	4	38
Main power switcher	1	168
Dynamic mic	1	49
Microphone boom stand	1	24
Mic extension cable	2	15
Console rack	1	449
A/V cable	1	336
Video/Audio selector	1	44
Control/Power unit	1	495
Chairman's unit	1	54
Delegate's unit	20	1,054
Cassette tape deck	1	Y95
Audio connecting cable	1	224
Multi-disk-player	1	145

EQUIPMENT	QTY	CIF PRICE (In Japanese Thousand Yen)
Overhead projector	1	Y36
Screen	1	31
Slide projector	1	168
Enlarger main unit	1	3,721
Stepdown transformer	1	
105mm lens	1	
90mm lens	1	
75mm lens	1	
Lens board	1	
Lamp	5	
6x6 film carrier	1	
6x9 film carrier	1	
35mm film carrier	1	
4x5 film carrier	1	
Automatic film developing set	1	Y412
Stepdown transformer	1	29
Washer tank	1	7
Developing	4	30
SUS hanger	40	45
Hanger rack	1	8
Photopaper developing vat	1	6
film dryer	1	188

EQUIPMENT	QTY	CIF PRICE (In Japanese Thousand Yen)
Photo paper dryer	1	¥201
Photo paper washer	1	82
FG film	10	117
Roll film	20	5
Photo paper	10	83
Photo paper	10	83
Dark room kit	1	248
Sub-Total:		¥32,281

(TiSTR分復活機材)

I. For TISI

Category 1. Recovery of Equipment Reduced

EQUIPMENT	QTY	PRICE (In Japanese Thousand Yen)
Portable watt meter	2	¥128
Portable watt meter	2	128
Watt meter	2	116
Watt-hour meter	1	180
Watt meter	1	121
Static voltmeter	1	350
Portable DC volt meter	5	132
Portable DC volt ammeter	2	96
Portable AC ammeter	5	144
Portable DC ammeter	5	115
Digital AC meter	1	980
Clamp multimeter	1	7
Digital circuit cester	5	58
Oscilloscope	3	735
Storage oscilloscope	1	503
Line counter	10	180
Timer	10	180
Timer	10	180
DC power supply source	2	588
Step down transformer	1	80
Filament heating transformer	1	270
Safety test tool kit	1	807

EQUIPMENT	QTY	
Temperature oven	1	Y767
DC volt-ammeter	1	48
3-chip CCD video camera	1	1,008
U-matic video cassette tape	15	243
U-matic video cassette tape	15	included in above
Video cassette tape	25	102
VHS video cassette tape	25	included in above
Low noise audio cassette tape	25	11
Dynamic microphone	1	84
Microphone boom stand	1	included in above
Microphone extension cable	2	included in above
Speaker system	1	91
Mounting bracket	2	included in above
Control power amplifier	1	244
Cassette tape deck	1	92
Compact disk player	1	55
Console rack	1	594
Cable	1	included in above
Main power switch	1	108
VTR	1	247
VTR	1	169
Color TV receiver	1	227
Console rack	1	216
VTR	1	247
VTR	1	169

EQUIPMENT	QTY	
Control power amplifier	1	Y244
Speaker system	1	91
Mounting bracket	2	included in above
Dynamic microphone	2	168
Microphone boom stand	2	included in above
Microphone extension cable	2	included in above
Console rack	1	594
A/V cable	1	included in above
color TV receiver	1	227
Cassette deck	1	92
CD player	1	55
Overhead projector	2	68
Screen	2	60
Slide projector	2	324
Sub-total:		Y12,723
CIF conversion (factor=1.0309)		Y13,116
Installation (0.0671 of CIF)		Y880
TOTAL (CIF + INSTALLATION)		Y13,996

Category 3. Addition of accessories and consumables

EQUIPMENT	QTY	
Metallurgical microscope and photographic attachment	1	¥163
X-ray projector		
(1) CS unit	1	145
(2) KV unit	1	112
Ultrasonic flaw detector:		
(1) add one more type	1	2,457
(2) Eddy current inspection	1	5,129
Angle probe: add 2 probes	2	74
Dilatometer:		
add Thermal gravimatic analyzer/ differential analyzer	1	7,841
X-ray spectrophotometer		
(1) Crystals: PX-4	1	800
(2) X-ray leakage detector (fixed type)	1	646
(3) X-ray leakage detector (portable type)	1	444
(4) Water purifier	1	343
(5) Portable-vacuum pump with cooling water unit	2	840

EQUIPMENT	QTY	
Inductivity Coupled Plasma Emission Spectrometer (ICPS)		
(1) Comparison Material for measurement	1	2,243
(2) Spare Parts Kit for Spectrophotometer	1	4,000
(3) Photomultiplier Tube for ICPS	1	2,000
(4) Sample Preparation Set	1	1,000
(5) Automatic voltage stabilizer for excitation Source	1 set	2,000
Consumables for testing (Recording chart, Thermo-couple, etc.)	1 set	¥3,644
Sub-total:		¥33,881
CIF conversion (factor=1.0309)		¥34,928
Installation (0.0671 of CIF)		¥2,344
TOTAL (CIF + INSTALLATION)		¥37,272
Category 1.		¥13,996
Category 3.		¥37,272
Grand Total for TISI:		¥51,268

LIST OF EQUIPMENT

(TiSTR分機材)

EQUIPMENT	QTY	CIF PRICE (In Japanese Thousand Yen)
A. MECHANICAL (TISTR)		
Digital roughness tester	1	¥500
Pendulum impact tester	1	1,321
Hardness tester (Brinell)	1	664
Hardness tester (Rockwell)	1	453
Induction furnace	1	435
Sub-Total:		¥3,373
B. ELECTRICAL (TISTR)		
Digital AC meter (Single phase, 2-wire_	1	¥832
Precision digital multimeter	1	669
Digital multimeter	1	63
Storage oscilloscope	1	520
30-point Selector for digital thermometer	1	119
Hybrid recorder	1	773
X-Y recorder	1	202
DC power supply source	2	483
Insulation breakdown tester	1	305
Safety test tool kit	1	835
Safety test tool kit	1	663
Cord bending fatigue tester	1	1,398
Hot mandrel heat resistance tester	1	2,267

EQUIPMENT	QTY	CIF PRICE (In Japanese Thousand Yen)
Photometric integrating sphere	1	29,246
Photometric bench	1	11,091
Chronometer	1	265
Sub-Total:		¥49,731
C. ELECTRONIC (TISTR)		
AM/FM signal genertator	1	¥737
Stereo signal generator	1	368
Audio signal generator	1	247
Electronic voltmeter	2	204
Frequency counter	1	49
Audio analyzer	1	1,072
Wow & flutter meter	1	115
Oscilloscope	1	507
DC power supply	1	234
Shield room with line filter	1	4,226
Dummy antenna	1	43
Sub-Total:		¥7,802
D. CHEMISTRY (TISTR)		
GC/MS	1	¥24,056
Thermal gravimatic analyzer/ differential analyzer	1	8,192
Universal testing machine	1	4,052

EQUIPMENT	QTY	CIF PRICE (In Japanese Thousand Yen)
Impact tester	1	Y326
Gear's rubber aging oven	1	1,445
Abrasion resistance tester	1	1,771
laboratory plastmill	1	8,099
Ozone weathering tester	1	12,815
Balance	1	313
Balance	1	104
Color meter	1	885
Color meter	1	4,520
Liquid chromatograph	1	5,502
Gas chromatograph with gas analyzer	1	2,919
Toxic gas leak detector	1	Y5,866
Oven	1	250
Muffle furnace	1	388
Laboratory refrigerated centrifuge	1	1,769
Ion chromatograph	1	3,226
Amino acide analyzer	1	6,410
Nitrogen analyzer	1	1,101
Fatty extractor	1	2,647
Fibertec system	1	1,426
High temp. solvent extractor	1	1,692

EQUIPMENT	QTY	CIF PRICE (In Japanese Thousand Yen)
Laboratory refrigerated centrifuge	1	Y596
Cooling shaking bath	1	489
pH meter	1	243
Oxygen meter	1	1,029
Auto clave	1	384
Anlytical mill	1	357
Water bath	1	71
Rotary evaporator	1	408
Hot plate	1	140
Oven	1	127
Analytical balance	1	313
Analytical balance	1	104
Sugar analyzer	1	5,591
Protein system	1	6,726
Vacuum dry oven	1	884
Cold room	1	566
Clean room	1	1,421
Ultra filtration system	1	435
Low temperature water circulation bath with aspirator	1	294
High performance thin layer chromatograph	1	Y4,834
Gas chromatograph	1	3,144

EQUIPMENT	QTY	CIF PRICE (In Japanese Thousand Yen)
CHN analyzer	1	¥8,596
Water bath	1	120
Rotary evaporator	1	408
Hot plate	1	134
Muffle furnace	1	375
Shaker with separatory funnel	1	250
Auto still	1	528
Water purifier	1	359
pH meter	1	243
Oven	1	127
UV-VIS spectrophotometer	1	3,102
Infrared spectrophotometer	1	4,515
Fluorometer	1	2,612
Emission spectrophotometer	1	¥42,987
Atomic absorption spectrophotometer	1	5,592
Sub-Total:		¥197,878
E. THERMAL (TISTR)		
Temperature oven	2	¥2,032
Oil bath with constant temperature device	2	301
Sub-Total:		¥2,333

EQUIPMENT	QTY	CIF PRICE (In Japanese Thousand Yen)
G. NDT (TISTR)		
Magnetic particle inspection	1	¥411
Magnetic particle inspection (current flow method)	1	2,249
Liquid penetrant	1	149
Eddy current inspection	1	5,359
Ultrasonic inspection	1	2,567
Radiographic examination Gamma ray projector	1	2,423
Radiographic examination (X-ray projector)	1	4,254
Sub-Total:		¥17,412
H. LENGTH (TISTR)		
3 co-ordinate measuring machine	1	¥6,983
Block gauge and accessory set	1	512
Block gauge set	1	188
Electronic comparator for block gauge	1	4,348
Autocollimater and polygon mirror	1	1,177
Standard wedge gauge block	1	501
Square master	1	470
Height master	1	644
Caliper checker	1	284
Dial gauge checker	1	118
Depth micrometer checker	1	199
Inside micrometer checker	1	124

EQUIPMENT	QTY	CIF PRICE (In Japanese Thousand Yen)
Height gauge	1	Y87
Dial gauge	5	13
Digimatic indicator	2	76
Cylinder gauge	2	76
Micrometer (standard)	1	14
H. NDT (TISTR)		
Micrometer (Digital)	1	Y74
Rod inside micrometer	1	46
Indicating micrometer	1	96
Electronic micrometer	4	532
Micrometer (bench)	1	69
Caliper (Digital)	3	42
Caliper (Standard)	3	35
Caliper (Dial)	2	25
Surface roughness tester	1	1,266
Optical parallel	1	15
Optical flat	3	36
Profile Projector	1	1,917
Precision level	2	60
Temp./humidity recorder	1	35
Granite plates	2	72
Base plates	2	72
Support stand	2	88
Digimatic mini-processor	2	63
Sub-Total:		Y20,357

EQUIPMENT	QTY	CIF PRICE (In Japanese Thousand Yen)
I. MASS (TISTR)		
Standard weight set (Stainless)	1	Y2,912
Standard weight	1	1,121
Standard weight set	25	326
High precision hand operated balance	1	3,090
Direct reading balance	1	4,292
Direct reading balance	1	1,177
Electronic floor scale	2	1,048
Electronic balance	1	101
Balance table	2	293
Barometer	1	328
Hygrometer (assman type)	1	64
Digital thermometr	2	38
Temp.humidity recorder	1	35
Desiccator	3	74
Sub-Total:		Y14,899
J. VOLUME (TISTR)		
Weighing machine	1	Y792
Direct reading balance	1	314
Standard flask	9	802
Standard pipette	8	168
Standard burette	8	951
Standard tank	3	6,895
Piston prover for gas	1	16,217

EQUIPMENT	QTY	CIF PRICE (In Japanese Thousand Yen)
Standard wet gas meter	3	¥2,981
Gas meter test equipment	1	2,852
Water master meter	4	984
Standard hydrometer	1	1,100
Specific gravity meter for LPG	2	298
Barometer	1	328
Constant temperature bath	1	317
Thermometer	2	200
Water distillation apparatus	1	460
Manometer	1	15
See-through gas meter	1	839
Plastic tubing	1	278
Desiccator	2	66
Specific gravity balance	1	751
Pycnometer	40	260
Prefabricated stand	2	49
Standard weight set	1	459
Dry oven	1	154
Experimental desk	1	276
Sub-Total:		¥38,806

EQUIPMENT	QTY	CIF PRICE (In Japanese Thousand Yen)
K. FORCE (TISTR)		
Force standard machine & accessory	1	¥18,174
Standard proving ring	6	2,486
Standardizing box	1	1,731
Load cell & amplifier	3	584
Load cell and amplifier	1	937
Load cell indicator	2	280
Wire strain gauge, strain meter	1	103
Torque transducer	2	1,137
Barometer	1	328
Temp./humidity recorder	1	35
Sub-Total:		¥25,795
Dead weight piston gauge	2	¥4,165
Precision pressure gauge	3	546
Liquid column pressure gauge	2	648
Calibration apparatus for vacuum meter	1	5,685
Standard barometer	1	635
Aneroid pressure gauge	24	462
Digital pressure gauge	9	1,167
Tool kit	1	138
Temp./humidity recorder	1	35
Air tight chamber	1	4,661
Pressure transducer	4	149

EQUIPMENT	QTY	CIF PRICE (In Japanese Thousand Yen)
Differential pressure transducer	4	Y608
Strain meter	1	261
Sub-Total:		Y19,160

L. RADIATION (TISTR)

Standard radiation detector with head and chopper	1	Y6,269
Standard source in UV region	3	582
Standard source in IR region	3	221
Spectro radiometer	1	3,775
Sub-Total:		Y10,847

M. ACOURSTIC (TISTR)

Primary standard microphone	1	Y2,387
Measuring amplifier	1	3,380
Sine generator	1	644
Power amplifier	1	418
Band pass filter	1	1,509
Multimeter	1	612
Programmable attenuator	3	1,118
Attenuator	2	118
Tone burst generator	1	421
Sound level meter	2	763
Level recorder	1	353

EQUIPMENT	QTY	CIF PRICE (In Japanese Thousand Yen)
Acoustic calibrator	1	Y112
Oscilloscope	1	297
Voltmeter	1	379
Frequency counter	1	221
Switch	1	315
System processor unit	1	2,212
Sub-Total:		Y15,259

N. ELECTRICAL (TISTR)

Standard cell	1	Y1,861
Channel switch for standard cell	1	930
Voltage standard	1	711
Standard shunt	1	1,370
Stabilized source	1	3,476
Cable and adapter set	1	1,645
High voltage source	1	3,448
High voltage standard divider	1	596
Differential voltmeter	1	1,514
AC/DC comparator	1	4,519
AC standard voltage source	1	2,421
Power amplifier	1	2,606
Current shunt	1	591

EQUIPMENT	QTY	CIF PRICE (In Japanese Thousand Yen)
AC/DC voltage & current supply	1	Y2,227
Power amplifer	1	1,429
Standard resistance	17	Y10,817
Oil bath	2	13,696
D.C.C.B.	1	10,742
Extender	1	3,038
Switch	1	941
Current source	1	480
High resistance measuring set	1	8,748
Resistance transfer standard	2	2,501
Resistance transfer standard	2	2,501
Resistance transfer standard	2	2,501
Variable resistor	10	1,051
AC/DC comparator	1	792
Measuring set for power meter power source	3	2,377

EQUIPMENT	QTY	CIF PRICE (In Japanese Thousand Yen)
N. ELECTRICAL (TISTR)		
Measuring set for power meter signal generator	2	Y1,300
Digital power meter (1-phase)	2	2,076
Digital power meter (3-phase)	2	2,218
Digital multimeter	2	475
Standard capacitor	2	1,154
Digital LCR meter	1	1,705
Decade capacitor	1	265
Measuring reciever	1	5,604
Selective level meter	1	1,238
Impedance transformer	3	29
Precision attenuator set	2	186
Frequency synthesizer	1	1,324
GP-IB Interface unit	1	
Standard signal generator	1	1,314
Step attenuator	1	Y308
Spectrum analyzer	1	5,460
Oscilloscope	1	2,225
Step attenuator	2	511

EQUIPMENT	QTY	CIF PRICE (In Japanese Thousand Yen)
Thermal converter	1	Y3,546
Frequency synthesizer	1	1,324
GP-IB Interface unit	1	
LF Impedance analyzer	1	2,209
RF impedance analyzer	1	3,378
VSWR bridge	1	930
Scalar network analyzer horizontal	1	1,486
Decade transformer standard	1	1,638
Sweep generator	1	3,201
Rubidium frequency standard	1	2,480
Frequency converter	1	505
Frequency counter	1	867
Power unit	1	630
RF power level control unit	2	1,831
RF power transfer standard	1	2,599
Synthesized signal generator	1	3,201
RF power transfer standard	2	1,864
Power meter	1	1,666
Digital voltmeter	1	379
Two channel power meter	1	879
Power sensor	1	105
Calibration generator	1	742
Time mark generator	1	583

EQUIPMENT	QTY	CIF PRICE (In Japanese Thousand Yen)
Leveled sine wave generator	1	Y636
Synchesizer	1	1,118
RF voltmeter (RF voltmeter)	1	1,820
Differential voltmeter	1	1,332
Wow flutter meter calibration	1	140
Distortion meter calibrator	1	Y671
Distortion meter (automatic)	1	356
Wow flucter meter	1	548
Signal analyzer	1	5,132
Sub-Total:		Y164,717

P. TEMPERATURE (TISTR)

Comparative calibration equipment for resistance thermometer	1	Y13,894
Thermo-couple/resistance thermometer fixed point calibration equipment	1	20,896
Salt bath	1	7,270
Ice maker	1	365
Ice crusher	1	383
Sub-Total:		Y42,808

EQUIPMENT	QTY	CIF PRICE (In Japanese Thousand Yen)
R. TESTING AND STANDARD ROOMS (TISTR)		
Testing table	35	Y4,294
Testing table with out-let	15	1,540
Chair for testing table	50	4,001
Sub-Total:		Y9,835
S. ADMINISTRATION OFFICE (TISTR)		
Typewriter	1	Y70
Copy machine	1	647
Sub-Total:		Y717
T. CPU (TISTR)		
Computer	2	Y3,113
External diskette drive		
Printer	2	628
Stencil copying machine	1	236
Copy machine	1	647
Work table	2	95
Facsimile	1	541
Sub-Total:		Y5,260

EQUIPMENT	QTY	CIF PRICE (In Japanese Thousand Yen)
W. SEMINAL ROOM 1,2 (TISTR)		
Desk	16	Y508
Chair	32	325
Desk	2	56
Chair	2	23
Blackboard	2	54
Table	17	Y627
Chair	50	1,610
Sub-Total:		Y3,203
Sub-Total (R/S/T/W):		Y19,015
X. VEHICLE (TISTR)		
Wagon for factory survey	1	Y2,283
Pick up truck for roving	1	2,311
Sub-Total:		Y4,594
Z. AUDIO VISUAL SYSTEM FOR SEMINAR ROOM (TISTR)		
Dyanamic mic	1	Y49
Microphone boom stand	1	24
Mic extension cable	2	15
Speaker system	1	75
Mounting bracket	2	19
Control power amplifier	1	253
Cassette tape deck	1	95

EQUIPMENT	QTY	CIF PRICE (In Japanese Thousand Yen)
Compact disk player	1	¥57
Console rack	1	336
Cable	1	280
Main power switcher	1	112
VTR beta	1	255
VTR VHS	1	175
Color TV receiver	2	235
Console rack	1	224
Universal video projector	1	¥1,250
Flat screen	1	129
Suspension support	1	49
Suspension support	1	76
Camera extension cable	1	50
Remote control unit	1	89
Betamax VTR	1	255
VHS VTR	1	175
Control power amplifier	1	253
Speaker system	2	151
Speaker stand	4	38
Main power switcher	1	168
Dynamic mic	2	98
Microphone boom stand	2	48
Mic extension cable	4	29
Console rack	1	447

EQUIPMENT	QTY	CIF PRICE (In Japanese Thousand Yen)
A/V cable	1	¥336
Video/Audio selector	1	44
Control/Power unit	1	494
Chairman's unit	1	¥54
Delegate's unit	20	1,051
Cassette tape deck	1	95
Audio connecting cable	1	224
Multi-disk-player	1	144
Overhead projector	1	36
Screen	1	31
Slide projector	1	168
Enlager set	1	DURST or equivalent 3,711
Stepdown transformer	1	
105mm lens	1	
90mm lens	1	
Lens board	1	
Lamp	5	
6x6 film carrier	1	
6x9 film carrier	1	
35mm film carrier	1	
4x5 film carrier	1	

EQUIPMENT	QTY	CIF PRICE (In Japanese Thousand Yen)
Automatic film developing set	1	¥411
Stepdown transformer	1	30
Washer tank	1	7
Developing	4	30
SUS hanger	25	45
Hanger rack	1	8
Photopaper developing vat	1	6
Film dryer	1	154
Photo paper dryer	1	121
Photo paper washer	1	82
FG film	10	117
Roll film	20	5
Photo paper	10	82
Photo paper	10	82
Dark room kit	1	247
Sub-Total:		¥13,324

ADDITIONAL EQUIPMENT

(TISTR分復活機材)

II. For TISTR

Category 1. Recovery of Equipment Reduced

EQUIPMENT	QTY	PRICE (In Japanese Thousand Yen)
Digital thermometer	1	¥658
High frequency breakdown tester	1	753
AM/FM signal generator	1	706
Audio signal generator	1	236
Electronic volt meter	1	98
Wow flutter meter	1	110
DC power supply	2	124
Temperature oven	2	1,945
Standard source in UV region	2	372
Standard source in IR region	2	141
Station wagon for factory survey	1	1,430
Audio visual for meeting room	1	1,887
Overhead projector	2	68
Screen	1	30
Slide projector	2	322
Wagon for factory survey	1	2,185
Sub-total:		11,065
CIF conversion (factor=1.0309)		11,407
Installation (0.0671 of CIF)		765
TOTAL (CIF + INSTALLATION)		12,172

Category 3. Addition of accessories and consumables

EQUIPMENT	QTY	PRICE (In Japanese Thousand Yen)
Digital roughness tester:		
add vibration isolator	1	¥192
Surface roughness tester:		
add vibration isolator	1	192
Accessories for temperature and humidity control of 3 (three) testing rooms	1	4,803
Sub-total:		¥5,187
CIF conversion (factor=1.0309)		¥5,347
Installation (0.0671 of CIF)		¥359
TOTAL (CIF + INSTALLATION)		¥5,706
Category 1.		¥12,172
Category 3.		¥5,706
Grand Total for TISTR:		¥17,878

第２期（２回目）機材リスト

List of additional testing equipment for TISI and TISTR

(TiSi分機材)

I. For TISI

Category 1. Recovery of Equipment Reduced （＝随契分）

NO.	EQUIPMENT	Q'ty increased
1	Portable watt meter	2
2	Portable watt meter	2
3	Watt meter	2
4	Watt-hour meter	1
5	Watt meter	1
6	Static voltmeter	1
7	Portable DC volt meter	5
8	Portable DC volt-ammeter	2
9	Portable AC ammeter	5
10	Portable DC ammeter	5
11	Digital AC meter	1
12	Clamp multimeter	1
13	Digital circuit tester	5
14	Oscilloscope	3
15	Storage oscilloscope	1
16	Line counter	10
17	Timer	10
18	Timer	10
19	DC power supply source	2
20	Step down transformer	1
21	Filament heating transformer	1
22	Sagety test tool kit	1
23	Temperature oven	1
24	DC volt-ammeter	1
25	3-chip CCD video camera	1
26	U-matic video cassette tape	15
27	U-matic video cassette tape	15
28	video cassette tape	25
29	VHS video cassette tape	25
30	Low noise audio cassette tape	35
31	Dynamic microphone	
32	Microphone boom stand	

NO.	EQUIPMENT	Q'ty increased
33	Microphone extension cable	2
34	Speaker system	1
35	Mounting bracket	2
36	Control power amplifier	1
37	Cassette tape deck	1
38	Compact disk player	1
39	Console rack	1
40	Cable	1
41	Main power switch	1
42	VTR	1
43	VTR	1
44	Color TV receiver	1
45	Console rack	1
46	VTR	1
47	VTR	1
48	Control power amplifier	1
49	Speaker system	1
50	Mounting bracket	2
51	Dynamic microphone	2
52	Microphone boom stand	2
53	Microphone extension cable	2
54	Console rack	1
55	A/V cable	1
56	Color TV receiver	1
57	Cassette deck	1
58	CD player	1
59	Overhead projector	2
60	Screen	
61	Slide projector	

Category 2. Recovery of Equipment Deleted or Reduced (＝入札分)

NO.	EQUIPMENT	Q'ty increased
1	Three dimensional manikin	1
2	Damping force tester	1

Category 3. Addition of accessories and consumables (＝随契分)

NO.	EQUIPMENT	Q'ty increased
1	Metallurgical microscope add photographic attachment	1
2	X-ray projector	
	(1) CS unit	1
	(2) KV unit	1
3	Ultrasonic flaw detector:	
	(1) add one more type	1
	(2) Eddy current inspection	1
4	Angle probe: add 2 probes	2
5	Dilatometer: add Thermal gravimatic analyzer/ differential analyzer	1
6	X-ray spectrophotometer	
	(1) Crystals : PX-4	1
	(2) X-ray leakage detector (fixed type)	1
	(3) X-ray leakage detector (portable type)	1
	(4) Water purifier	1
	(5) Portable vaccuum pump with cooling water unit	

NO.	EQUIPMENT	Q'ty increased
7	Inductively Coupled Plasma Emission Spectrometer (ICPS)	
	(1) Comparison material for measurement	1
	(2) Spare parts kit for spectrophotometer	1
	(3) Photomultiplier tube for ICPS	1
	(4) Sample preparation set	1
	(5) Automtic voltage stabilizer for extension source	1
8	Consumables for testing (Recording chart, Thermo-couple, etc.)	

(TISTR分機材)

I. For TISTR

Category 1. Recovery of Equipment Reduced (＝隋契分)

NO.	EQUIPMENT	Q'ty increased
1	Digital thermometer	1
2	High frequency breakdown tester	1
3	AM/FM signal generator	1
4	Audio signal generator	1
5	Electronic volt meter	1
6	Wow flutter meter	1
7	DC power supply	2
8	Temperature oven	2
9	Standard source in UV region	2
10	Standard source in IR region	2
11	Station wagon for factory survey	1
12	Audio visual for meeting room	1
13	Overhead projector	2
14	Screen	1
15	Slide projector	2
16	Wagon for factory survey	1

Category 2. Recovery of Equipment Deleted or Reduced (＝入札分)

NO.	EQUIPMENT	Q'ty increased
1	Standard plug for dimensional testing	1
2	Special cap for twist test	1
3	Flux meter	1
4	Luminance meter	1
5	Digital illumination meter	1
6	Melt index	1
7	Acceleration weathering tester	1
8	Protein system	
	(1) add radioactive detector	1
	(2) add redioactive detection for low energy radionuclides	1
9	Spectro radiometer	1

Category 3. Addition of accessories and consumables (＝随契分)

NO.	EQUIPMENT	Q'ty increased
1	Digital roughness tester: add vibration isolator	1
2	Surface roughness tester: add vibration isolator	1
--------	Accessories for temperature and humidity control of 3.(three) testing rooms	1

JICA