

7. 技術協力事業の問題点とその対策

7.1 マレーシア側の問題点とその対応策

7.1.1 測定環境の整備

よい測定を行うためには、①正確な標準器とよい測定器が整備されていること。②標準器及び測定器を取扱う技術をもっていること。③測定者がその測定と周辺の学識をもっていること。④測定環境が整備されていること。

これらは必須の条件である。当プロジェクトで上記①に関しては供与機材によって満たされている。②に関しては技術移転を行った現在でも十分に満足とはいえないが、当面支障はなく、今後とも技術レベルの向上の努力を期待する。③についても、必ずしも十分ではないがプロジェクト開始当初に比較すれば相当向上しており、支障は少ない。最も問題の大きいのが④であり、現状では、国の計量標準の中核的役割を果たす研究所の測定環境とはいえない。

具体的に記述すると

a) 温度・湿度について

日本における精密測定室は、設定した温度、相対湿度に対して、それぞれ $\pm 1^{\circ}\text{C}$ 、 \pm 数%で、必要に応じて昼夜連続して制御されているのが一般的である。ところが、SIRIMでは、停電がしばしばあり、それらは短時間で回復する時もあるが、ときとしては2～3日続くこともある。温度制御もON-OFF方式で好ましくない。しかも昼夜連続運転は不可能ではないが困難である。湿度の制御は働かない。日照負荷の対策がとられていない。

b) 振動について

空調機械運転の振動が測定室に伝わる。(設計段階で、除震の配慮がされていない。)

c) 土ホコリ、虫について

測定室の窓、扉等が気密に近い状態になるように作られていないため、外気が入り、それとともに砂塵、虫(蟻、蜘蛛、ゴキブリ等)等が侵入して機器類の汚れ、湿気による錆等の損傷を招き易い。

d) 空調機械の整備

日本と異なり冷房機械を一年中運転するので保守整備がしにくく故障が多い。

7.1.2 機材の整備

SIRIM自身が保有していたいくつかの測定器があるが、マレーシアで修理ができないため性能が劣化しているものが多い。たとえば、ホルタン型気圧計は、封入されている水銀が汚れ、液面で光の反射が見られない。これは皮袋を交換し、水銀を精製したものに交換しなければならないが、マレーシアでは気圧計の修理はできない。他の機材についても同様に修理は困難である。したがって、これら機器の保守は当分の間は日本側で面倒みざるを得ないであろう。

7.1.3 人材の確保

1985年における SIRIM 全体の定員は752名であった。この定員はさらに研究員、補助研究員、技術員等に細分されている。定員752名に対して、1985年末には100名近い欠員があった。この欠員のうち約半数は研究員等の学卒者の欠員である。

発展途上にあるマレーシア社会の中で、学卒者の求人が多く、制府機関で学卒者を採用することが困難な状態にある。

計量部門の研究員の定数は13名で、欠員はなく、満たされていた。しかし、プロジェクト開始のときマレーシア側は研究員の数を16名にする計画であるとしていた（R/Dの付属書 ANNEX-IV）が、プロジェクト終結時でも16名には達しなかった。SIRIMの努力は欠員の補充程度にとどまり、足員枠の拡大までは及ばなかった。研究員13名では十分とはいいがたい。

計量の、特に標準と直接係わる正確さと精密さが要求される測定では、その測定技術とともに、周辺の知識を必要とする。学卒の研究員であっても、日本の場合の研究公務員に比較すれば、実力において大きな隔りがあり、まして、専門学校卒程度の補助研究員では基礎学力が不足である。そこで補助研究員や技術員も指導して精密測定ができるように育成することを考え実施したが、よい仕事ができをように成長したとしても、技術員が補助研究員に、補助研究員が研究員に昇格されることはない。このような学歴による階級制度が存在するためか、仕事に対する熱意は薄い。したがって、マレーシア国立計量研究所がマレーシアの計量標準の中核機関としての役割を果たすためには、少なくとも計量部門の定員の2/3が学卒研究者であることが望ましい。

7.1.4 普及活動

メートル法の普及活動と合わせて、国家標準とトレーサブルな計量標準の供給業務（検査、校正等）を行い、もつて、マレーシアにおける工業製品の品質向上に役立たせるため、当プロジェクトにおける公報誌を前期と後期にそれぞれ2000部宛発刊して各関係機関に配付して宣伝活動につとめたが、今後とももっと活発に、広範囲に行い、当プロジェクトの成果の活用を図らなければならない。

すでに貿易産業省と SIRIM が協力して実施し始めていることであるが、店頭商品を試買しこれらの正味量検査を行い、消費者保護活動をすることによって計量思想の普及を図る。また、セミナー、実習等を開催し、政府機関及び企業等の職員の知識及び技術の向上に努める等である。

7.2 日本側の反省と対策

7.2.1 講送機材

当プロジェクトは SIRIM を国の計量標準の中核機関として機能させることを目的としている。

したがってそこで使用される測定機器は産業界で一般的に使用されているものよりも高精度のものが多い。購送機材の中にはメーカーが受注後製造を始めるもの、あるいは設計段階から国内支援機関と検討した特別注文の機材もあり、これらは、一般的に納期が長い（標準器の中には納期が一年以上のものもあった。）商社は JICA から一括受注し、納品は数分割されるとしても納期の遅い方に従う傾向になる。多分割の購送は事務量の増加を伴うが、できるだけ早く機材を現地に到着させる対策が肝要である。

機材輸送に際し、巨大な木箱梱包はプロジェクトサイトでしばしば困惑した。巨大な木箱梱包の機材は室内に運び入れることができず屋外で解梱しなければならないが、熱帯圏では天候の変化が急であり、朝晴天でも 2～3 時間後に豪雨になり、屋外での長時間にわたる解梱作業は好ましくない。

また、供与機材は現地の実状を考慮した仕様で購送して欲しい。たとえば、現地の供給電圧が単相 240 V、3 相 415 V であるが購送機材は単相 100 V、3 相 100 V のものがそのまま組込まれ、それと接続するために変圧器が付加されている場合がある。この方法で、当面は問題ないが、故障、破損等の際、交換部品が現地で入手しがたい。

7.2.2 プロジェクト終結後の援助

当プロジェクトで供与した機材は精密測定器が多い。これらがその能力を発揮するためには点検、調整が必要であり、また場合によっては部品の交換、修理も必要である。しかし、現地にそれらの代理店がない機材については、SIRIM 側は手の施しようがない。そこで、供与した機材について当分の間 JICA がそれらの調整、修理等についての援助を、前向きで検討されるよう希望する。

移転した技術や知識が、プロジェクト終結後に低下することを防ぐために、専門家の派遣と研修員の受入れをそれぞれ年 1 回程度実現したい。

供与した標準器類には、それぞれ日本の計量研究所あるいは電子技術総合研究所がもっている日本の標準とトレーサブルな値がつけられているが、標準が「物」であるために、それらは変化することと予想される。そこで、今後も、わが国の標準との比較測定による確認が必要であり、この協力は今後とも続けなければならない。

7.3 総括

全体的にみるとこの技術協力事業は初期から終了まで順調に進展し、計画期間内に全予定を終了しており、供与機材や移転技術がすでに活用されているので、その成果は高く評価できる。

具体的には、日本側は、JICA をはじめ国内支援機関として計量研究所および電子技術総合研究所等の対応は「3. 技術協力事業の実績」でも述べたが、供与機材、専門家派遣、研修員受入れ、技術移転のすべてについて計画よりも 10～30% 上回っている。表 7.1 に評価一覧を示す。

一方、マレーシア側についても、「5. マレーシア測の対応」で述べたように、国立計量研究所建物の建設時期が若干遅れはしたが、政府の緊縮財政策のもとで完成させた。また研究者の補充も行うなど、この事業推進に意欲的に取組んだことは高く評価してよい。

そして供与した機材や移転した技術を直ちに行政面で活用し始め、それが産業界で役立っているであろうことは、マレーシア計量研究所が実施している計量器の校正及び検査箇数の増加からみて明らかである。SIRIMにおける検査箇数の年度別推移を図7.1に示す。この図が示すようにこの協力事業の進展に伴い検査箇数の急激な増加がみられる。

表 7-1-1 評 価 一 覧

指 導 分 野	年 度 計 画				実 績	計画達成率 (%)
	1982	1983	1984	1985		
長さ L-1 直尺検査 (1級直尺も含む)	↔	↔	↔	↔	追加機材・技術移転 L-8 三次元測定 (機) L-9 レーザ測長 (機) L-10 光学式回転テーブ L-11 光マイクログメータ	全体: 120 (L-7: 50)
L-2 巻尺検査 (基準巻尺 ")	↔	↔	↔	↔		
L-3 標準尺 (1 m, 1 mm)	↔	↔	↔	↔		
L-4 万能測長機 (1 m, 200 mm)	↔	↔	↔	↔		
L-5 形状測定 (あらさ, 真円度等)	↔	↔	↔	↔		
L-6 角度測定	↔	↔	↔	↔		
L-7 巡回検査・指導	↔	↔	↔	↔		
質量 M-1 質量原器 (1 kg, 10 ⁻⁷) 1ヶ	↔	↔	↔	↔	M-7 特殊天びん M-8 比重天びん M-9 重錘式圧力標準器 M-10 力標準器	全体: 130 (M-5: 90) (M-6: 50)
M-2 分銅の校正	↔	↔	↔	↔		
M-3 天秤 "	↔	↔	↔	↔		
M-4 一般はかり	↔	↔	↔	↔		
M-5 電子はかり	↔	↔	↔	↔		
M-6 巡回検査・指導	↔	↔	↔	↔		
体積 V-1 油の計測	↔	↔	↔	↔	V-4 KPG体積標準器 V-5 流量標準器	全体 100 (V-1: 80) (V-3: 90)
V-2 ガスの計測	↔	↔	↔	↔		
V-3 巡回検査・指導	↔	↔	↔	↔		
温度 T-1 温度標準用一般設備	↔	↔	↔	↔	T-6 油温槽 (300 °Cまで) T-7 硝石槽 (600 °Cまで) T-8 縦型電気炉 (1,500 °Cまで)	全体 110 (T-4: 30) (T-5: 50)
T-2 低温槽 (-200 °C)	↔	↔	↔	↔		
T-3 電気炉 (+2,000 °C)	↔	↔	↔	↔		
T-4 光高温計測定	↔	↔	↔	↔		
T-5 巡回検査・指導	↔	↔	↔	↔		
電気 E-1 抵抗標準と校正	↔	↔	↔	↔	E-13 Rb 周波数発信器	全体: 100 (E-1: 120) (E-5: 110) (E-6: 110) (E-8: 80) (E-12: 30)
E-2 電圧標準と校正	↔	↔	↔	↔		
E-3 高抵抗標準と校正	↔	↔	↔	↔		
E-4 高電圧標準 (~1 kV) と校正	↔	↔	↔	↔		
E-5 直流指示計器の校正	↔	↔	↔	↔		
E-6 交流電流電圧標準と交流指示計器の校正	↔	↔	↔	↔		
E-7 電力標準と電力計の校正	↔	↔	↔	↔		
E-8 位相計の校正	↔	↔	↔	↔		
E-9 容量標準と校正	↔	↔	↔	↔		
E-10 インダクタンス標準と校正	↔	↔	↔	↔		
E-11 データ処理技術, IR システムの確立	↔	↔	↔	↔		
E-12 巡回指導・検査	↔	↔	↔	↔		

↔ 発注 現地組立 技術移転 巡回検査指導

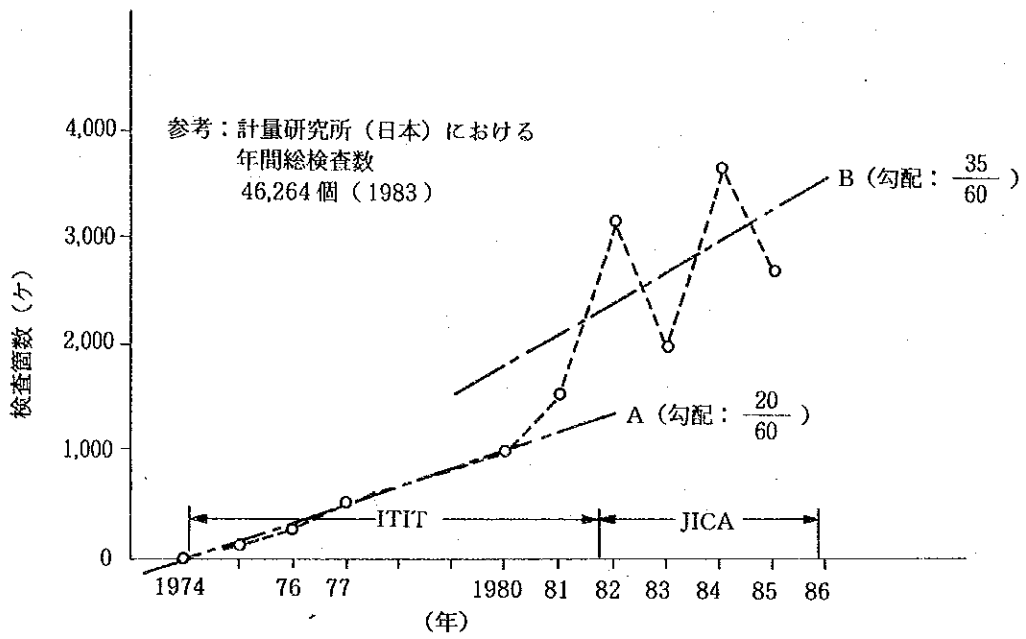


図 7 - 1 SIRIM における年度別検査箇所数 (全量)

付 属 資 料

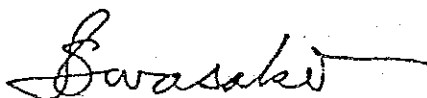
- 討議議事録 (R/D)
- JOINT EVALUATION REPORT
- MINUTES OF MEETING

THE RECORD OF DISCUSSIONS BETWEEN THE JAPANESE
IMPLEMENTATION SURVEY TEAM AND THE AUTHORITIES
CONCERNED OF THE GOVERNMENT OF MALAYSIA ON THE
TECHNICAL COOPERATION FOR THE PROJECT ON THE
NATIONAL METROLOGY LABORATORY OF STANDARDS AND
INDUSTRIAL RESEARCH INSTITUTE OF MALAYSIA

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. Susumu Iwasaki, Chief, Office of the International Relation, National Research Laboratory of Metrology, Agency of Industrial Science and Technology, Ministry of International Trade and Industry, visited Malaysia from December 6, 1981 to December 20, 1981 for the purpose of working out the details of the technical cooperation programme concerning the project on the National Metrology Laboratory of Standards and Industrial Research Institute of Malaysia.

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

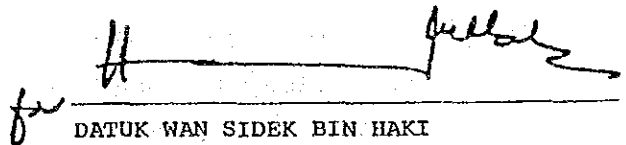
As a result of the discussions, the Team and the Malaysian authorities concerned agreed to recommend to their respective Governments the matters referred to in the document attached hereto.



MR. SUSUMU IWASAKI,
Leader,
Japanese Implementation Survey Team,
Japan International Cooperation
Agency, Japan

17th December, 1981

Kuala Lumpur.



DATUK WAN SIDEK BIN HAKI
WAN ABDUL RAHMAN,
Secretary-General,
Ministry of Science, Technology
& Environment, Malaysia

THE ATTACHED DOCUMENT

I. COOPERATION BETWEEN BOTH GOVERNMENTS

1. The Government of Japan and the Government of Malaysia will cooperate with each other in implementing the technical cooperation project on the National Metrology Laboratory of Standards and Industrial Research Institute of Malaysia (hereinafter referred to as "the Project") for the purpose of meeting the needs of the metrication programme and the requirements for metrology in Malaysia, thereby contributing to the development of the industry of Malaysia.
2. The Project will be implemented in accordance with the Master Plan which is given in Annex I.

II. DISPATCH 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 Annex II 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 Malaysia the privileges, exemptions and benefits in accordance with General Circular No. 1 of 1979 and Amendment to General Circular No. 1 of 1979 of the Government of Malaysia.

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 materials necessary for the implementation of the Project as listed in Annex III, through the normal procedures under the Colombo Plan Technical Cooperation Scheme.



2. The articles referred to in 1 above will become the property of the Government of Malaysia upon being delivered c.i.f. to the Malaysian 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 Annex II.

IV. TRAINING OF MALAYSIAN 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 Malaysian 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 Malaysian will take necessary measures to ensure that the knowledge and experience acquired by the Malaysian personnel from technical training in Japan will be utilized effectively for the implementation of the Project.

V. SERVICES FOR MALAYSIAN COUNTERPART PERSONNEL AND ADMINISTRATIVE PERSONNEL

1. In accordance with the laws and regulations in force in Malaysia, the Government of Malaysia will take necessary measures to secure as its own expense necessary services for Malaysian counterpart personnel and administrative personnel as listed in Annex IV.
2. As to the Malaysian counterpart personnel, the Government of Malaysia will endeavour to allocate the necessary number of suitably qualified personnel corresponding to each Japanese expert to be dispatched by the Government of Japan as specified in Annex II, for effective and successful implementation of the Project.

VI. MEASURES TO BE TAKEN BY THE GOVERNMENT OF MALAYSIA

1. In accordance with the laws and regulations in force in Malaysia, the Government of Malaysia will take necessary measures to



provide at its own expense:

- (1) Land, buildings and facilities as listed in Annex V;
 - (2) Supply or replacement of machinery, equipment, instrument, vehicles, tools, spare parts and any other materials necessary for the implementation of the Project other than those provided through JICA under III above.
2. In accordance with the laws and regulations in force in Malaysia, the Government of Malaysia will take necessary measures to meet:
- (1) Expenses necessary for the transportation within Malaysia of the articles referred to in III above as well as for the installation, operation and maintenance thereof;
 - (2) Customs duties, internal taxes and any other charges, imposed in Malaysia on the articles referred to in III above;
 - (3) All running expenses necessary for the implementation of the project.

VII. ADMINISTRATION OF THE PROJECT

1. The Secretary General of the Ministry of Science, Technology and Environment (hereinafter referred to as 'MSTE') through the Controller of Standards and Industrial Research Institute of Malaysia (hereinafter referred to as 'SIRIM') will bear overall responsibility for the implementation of the Project. The Director of Standards, as head of Project, under the supervision and direction of the Controller of SIRIM will be responsible for the administrative and managerial matters of the implementation of the Project.
2. The Japanese Chief Advisor will provide necessary recommendation and advise on technical matters concerning the implementation of the Project to the Controller of SIRIM in close coordination with the Head of the Project.
3. For the effective and successful implementation of the Project, a Joint Committee (hereinafter referred to as 'the committee') will be established as referred to in Annex VI.

The Committee, which will meet as and when necessary, will have the function to review the progress of the annual work plan and recommend measures to be taken by the two Governments on matters pertaining to the implementation of the project.

VIII. CLAIMS AGAINST JAPANESE EXPERTS

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

IX. MUTUAL CONSULTATION

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

X. TERM OF COOPERATION

The duration of the technical cooperation for the Project under this Attached Document will be basically four (4) years from December 17th, 1981. However, there will be a general review by the Committee on the progress of the implementation of the Project after two (2) years from the commencement of the cooperation.



ANNEX - I MASTER PLAN

1. Main functions of the Project are:

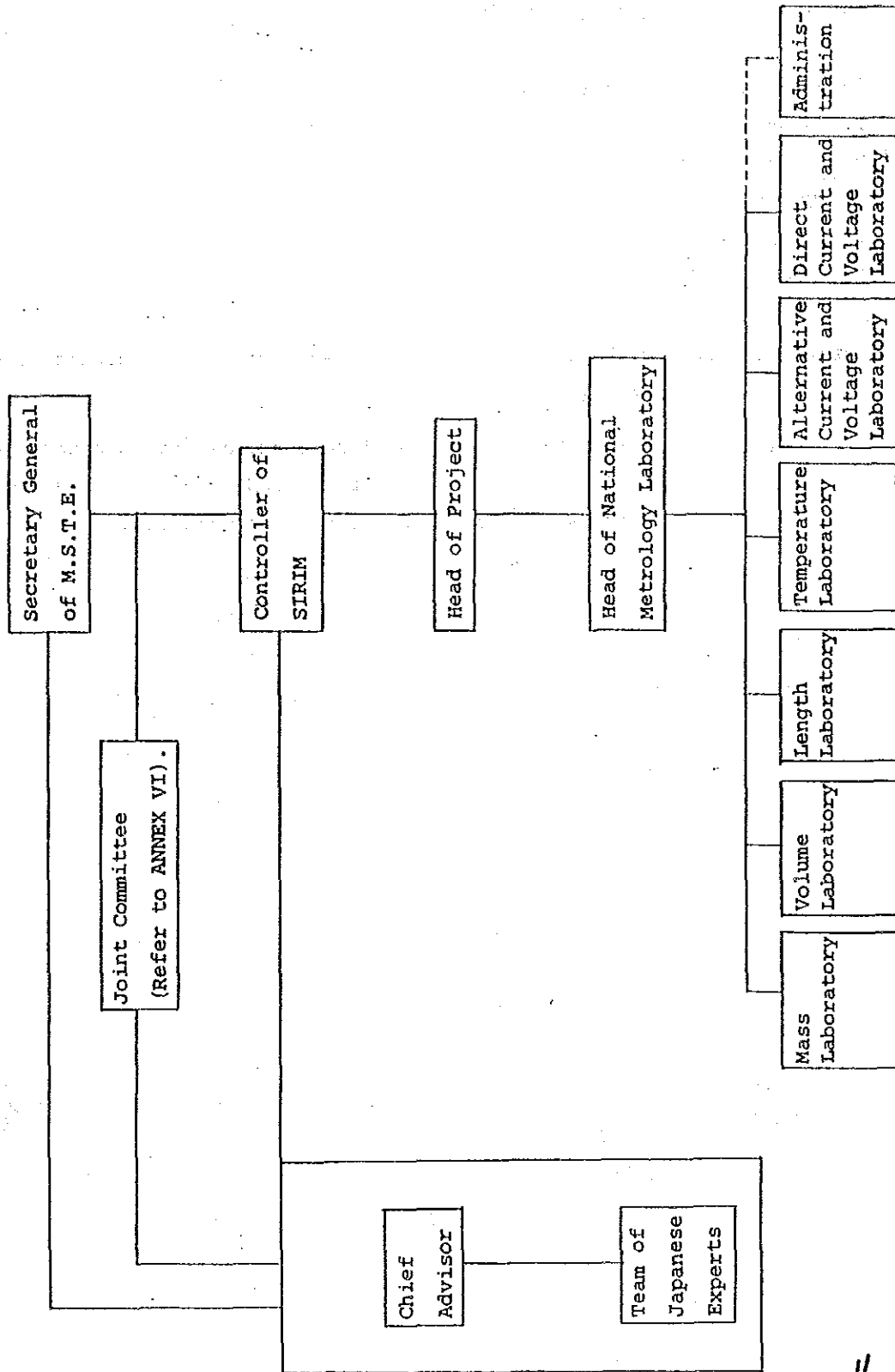
- (1) To procure and maintain the national basic standards (primary, secondary, tertiary and working standards) of weight and measure,
- (2) To establish the standards supplying system and
- (3) To provide technical consulting and training services related to (1) and (2) above for the governmental organization and private enterprises in the fields of length, mass, volume, temperature and electricity.

2. Scope of the technical cooperation is as follows;

- (1) Establishment of Metrological System
 - (i) Tolerance system
 - (ii) Inspection system
 - (iii) Supplying system of measurement standards
- (2) Assembly and adjustment of instruments
- (3) Maintenance of standards and instruments
- (4) Transfer of technology
 - (i) Technology for operating instruments
 - (ii) Technology for inspection, test and verification
 - (iii) Development of manuals on operation, usage and maintenance of instruments.
- (5) Metrological management
 - (i) Education and diffusion of metrology
 - (ii) Control of measurement



3. Organization For Implementation



ANNEX -II JAPANESE EXPERTS

Experts in the fields of;

1. Mass
2. Length
3. Volume
4. Temperature
5. Electricity

Note: (1) One of the above-mentioned experts will be appointed as the Chief-Advisor.

- (2) Short-term experts may be dispatched, as and when necessary, for the installation of equipment and machinery provided by the Government of Japan and for other purposes.



ANNEX -III LIST OF THE MAIN ARTICLES

1. LENGTH

- (1) Standard gauge blocks
- (2) Standard scales
- (3) Standard tapes
- (4) Standard angle
- (5) Comparator for scale
- (6) Inspection machine
- (7) Calibration device for tape
- (8) Calibration device for angle
- (9) Industrial measuring instruments

2. MASS

- (1) Standard weights
- (2) Precision balances
- (3) Balance for inspection
- (4) Other weighing machines

3. VOLUME

- (1) Standard tank
- (2) Oil meters
- (3) Gas provers
- (4) Flow meters, blowers and others

4. TEMPERATURE

- (1) Temperature standards (Platinum resistance thermometers)
- (2) Standards resistors
- (3) High precision bridge with null detector
- (4) Measuring equipments for temperature range $-50 \sim 1500^{\circ}\text{C}$
- (5) Accessories for measuring fixed points

5. ELECTRICITY

- (1) Resistance standards and measuring instruments
- (2) Impedance standards and measuring instruments

- (3) Voltage and current standards and measuring instruments
- (4) Power standards and measuring instruments
- (5) Frequency and time standards and measuring instruments

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ANNEX - IV LIST OF MALAYSIAN STAFF

1. Head of the National Metrology Laboratory of SIRIM
2. Counterpart personnel to the Japanese experts
At least sixteen (16) research officers corresponding to the fields of the experts as listed in Annex II.

	<u>Number</u>
(1) Mass	(3)
(2) Length	(3)
(3) Volume	(3)
(4) Temperature	(3)
(5) Electricity	(4)

3. Administrative Staff
 - (1) Administration
 - (2) Accounting
 - (3) Clerical work
4. Other personnel mutually agreed upon as necessary



ANNEX - V LIST OF LAND, BUILDING AND FACILITIES

1. Space of land and building necessary for the Project
2. Office rooms for the experts
3. Conference rooms
4. Library
5. Others



ANNEX - VI MEMBERS OF THE JOINT COMMITTEE

1. Chairman Controller of SIRIM

2. Malaysian Side:

- (1) Representative of the Economic Planning Unit
- (2) Representative of the Ministry of Trade and Industry
- (3) Representative of the Ministry of Science, Technology & Environment
- (4) Head of the Project
- (5) Any other personnel concerned

3. Japanese Side:

- (1) Chief Advisor
- (2) The relevant experts
- (3) Representative of Embassy of Japan
- (4) Personnel concerned to be despatched by JICA if necessary
- (5) Resident representative of Kuala Lumpur Office, JICA.



JOINT EVALUATION REPORT

BY THE

EVALUATION TEAM OF

THE JAPAN INTERNATIONAL COOPERATION AGENCY

AND

STANDARDS AND INDUSTRIAL RESEARCH INSTITUTE

OF MALAYSIA

MINISTRY OF SCIENCE, TECHNOLOGY AND ENVIRONMENT

ON THE

TECHNICAL COOPERATION ON THE PROJECT

ON THE NATIONAL METROLOGY LABORATORY

OCTOBER, 1985

KUALA LUMPUR

(5)

EVALUATION REPORT

I. INTRODUCTION

1. Objective

The Japanese Evaluation Team (hereinafter referred to as "the Team") organized by the Japan International Cooperation Agency, and headed by Mr. Toshio Kitamura, Director, Mining and Industrial Development Cooperation Department, JICA, was in Malaysia from September 28 to October 5, 1985, for the purpose of confirming the results achieved by the Japan-Malaysia Technical Cooperation on the project on the development of "the National Metrology Laboratory" in Standards and Industrial Research Institute of Malaysia, based on the Record of Discussions (hereinafter referred to as "R/D") which was signed on December 17, 1981, between the Japanese Implementation Survey Team and the Ministry of Science, Technology and Environment Malaysia.

2. Summary of the Project

The results in chronological order achieved by the Japan-Malaysia Technical Cooperation for the project are summarized as follows:-

- 1981 - 1. Despatch of the implementation survey team (Dec.) to Malaysia.
- 2. Start of "Technical Cooperation for the Project on the National Metrology Laboratory" (17th Dec.).
- 1982 - 1. Despatch of chief advisor (Jul.) to Malaysia.
- 2. Despatch of a long-term expert (mass and volume) (Oct.) to Malaysia.

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3. Arrival of the first shipment of supplied machines and materials at the project site (Oct.).
4. Arrival of the first shipment of supplied machines and materials at the project site (Nov.).
5. Despatch of two trainees (volume and electricity) to Japan (Dec.).

- 1983 -
1. Opening ceremony for the presentation of the first shipment of supplied machines and materials (Jan.).
 2. Despatch of three short-term experts (mass, volume and electricity) (Feb.) to Malaysia.
 3. Despatch of consultation team of the project to Malaysia (Mar.).
 4. Execution of the annual plan of the project (Mar.).
 5. Arrival of supplied machines and materials for fiscal year of 1982 at the project site (Apr.).
 6. The First Meeting of the Joint Committee (May).
 7. The Second Meeting of the Joint Committee (Nov.).

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8. Despatch of two trainees (temperature and electricity) to Japan (Dec.).

9. Despatch of a long-term expert (electricity) (Dec.) to Malaysia.

1984 - 1. Despatch of three short-term experts (mass, electricity and repair of machines and materials) (Jan.) to Malaysia.

2. Despatch of a short-term expert (volume) (Feb.) to Malaysia.

3. Despatch of a trainee (volume) to Japan (Feb.).

4. Third Meeting of the Joint Committee (Mar.).

5. Arrival of machines and materials for fiscal year of 1983 and supplied to the project site (Apr.).

6. Despatch of the Technical Guidance Team (Jun.).

7. Execution of the annual plan of the project (Jun.).

8. Fourth Meeting of the Joint Committee (Jun.).

9. The change of the chief advisor (Jul.) to Malaysia.

10. Despatch of a long-term expert (mass and electricity) (Sept.) to Malaysia.
 11. Despatch of three trainees (mass, temperature and electricity) to Japan (Dec.).
- 1985 -
1. Despatch of three short-term experts (length, temperature and electricity) (Jan.) to Malaysia.
 2. Despatch of two short-term experts (volume and legal metrology) (Feb.) to Malaysia.
 3. Despatch of the Equipment Repair Team (Feb.) to Malaysia.
 4. The Fifth Meeting of the Joint Committee (Mar.).
 5. Execution of the annual plan of the project (May).
 6. Arrival of Machines and materials for fiscal year of 1984 and supplied to the project site (May).
 7. Despatch of a short-term expert (maintenance) (Jun.) to Malaysia.
 8. Despatch of three trainees (length, temperature, inspection) to Japan (Jul.).



9. Arrival of supplied machines and materials for fiscal year of 1984 and supplied to the project site (Aug.).
10. Despatch of three short-term experts (maintenance, length and temperature). (Sept.) to Malaysia.
11. Despatch of the Evaluation Team (Sept.).
12. The Sixth Meeting of the Joint Committee (Oct.).

The following experts will be despatched:

1. Three short-term experts (electricity, maintenance and repair of machine) (Oct. and Nov.) to Malaysia.

II. RESULT OF EVALUATION

1. Building and facilities

The construction of the National Metrology Laboratory building in SIRIM was completed in February 1985. Most of the technology transfer activities are now being conducted in the new National Metrology Laboratory building. However some technology transfer activities are still being carried out in the old building.

2. Staffing of SIRIM

Although the actual number of staff required for each technical field have fall short of that initially agreed in the R/D (refer to Annex I) adequate number of officers necessary for technology transfer has been provided.

3. Provision of equipment by JICA

Most of the equipment which were initially agreed to be supplied by JICA in the R/D have been provided to the satisfaction of the Malaysian side.

The rest of equipment will be provided (refer to Annex III).

4. Japanese Expert

In the tentative implementation schedule (refer to Annex II of R/D), it was planned that two long-term experts and twelve short-term experts will be assigned and be despatched from 1981 until the completion of the cooperation in 1985.

Due to slight delay of technology transfer at an early stages of cooperation, it was decided four long-term experts and eighteen short-term experts be despatched instead. Annex IV shows the service terms and professional fields of study of the experts. Various teams such as Technical Guidance Team and Maintenance Team were despatched to promote the implementation of the project (refer to Annex V).

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5. Training in Japan

Although it was planned that ten Malaysian counterpart personnels were to be despatched to Japan for technical training, twelve persons were sent and trained in Japan instead. The name-list of the trainees sent to Japan, the terms and fields of study for each one are shown in Annex VI.

6. Progress of Technology Transfer


Technology transfer under the plan will be completed by the end of the period which is indicated in the R/D (refer to Annex VII).

7. Budget

The construction cost of the new building which was borned by the Malaysian side amounted to M\$3 million (Y300 million).

The cost borned by the Japanese side for this project type technical cooperation amounted to M\$5 million (Y500 million).

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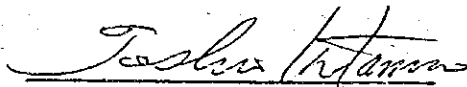


Mutually attested and submitted

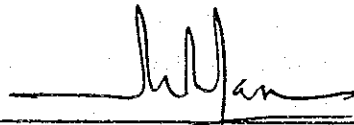
to the concerned

October 1985

Kuala Lumpur



Mr. Toshio Kitamura
Leader,
Japanese Evaluation Team,
Japan International
Cooperation Agency,
Japan.



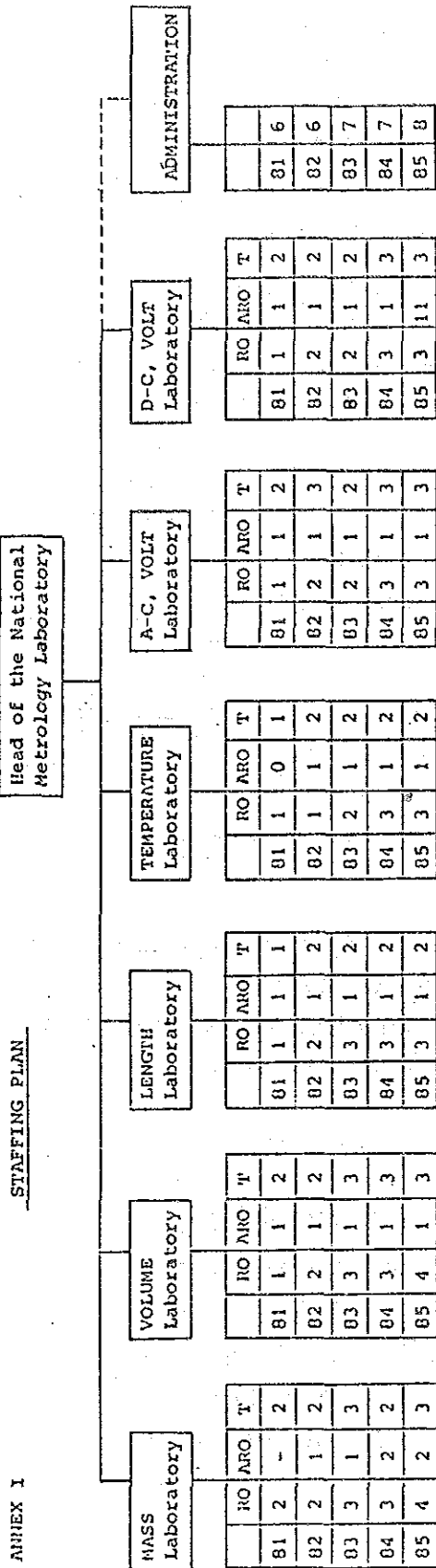
Dr. Mohd. Mansor bin Hj. Salleh
Controller,
Standard and Industrial
Research Institute of Malaysia,
Ministry of Science, Technology
and the Environment.



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ANNEX I

STAFFING PLAN



NOTE: RO: Research Officer
 ARO: Assistant Research Officer
 T: Technician

	RO	ARO	T	TOTAL
1981	8	4	10	22
1982	12	6	13	31
1983	16	6	15	37
1984	19	7	16	42
1985	21	7	17	45

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THE MALAYSIAN TRAINEE IN SIRM

Head of Metrology Unit	En. Ong Chin Giap
Length Metrology	En. Mohd. Fawzy Bin Othman (In charge Eng.)
	En. Rahim Bin Jamil
	Cik Chin Yong Lin
	Cik Hasnah Bte. Mohd. Joned
	En. Chen Soo Fatt (Length Std.)
	En. Mohd. Asri bin Mansor
Mass Metrology	En. Chen Soo Fatt (In charge)
	En. Ahmad Makinudin Bin Dahlan
	Cik Lee Booi Eng
	Puan Norizan bt. Mat Yassin
	En. Aminuddin Bin Ahmad
Temperature Metrology	En. Abdul Jalil Bin Baharudin (In charge)
	En. Yeoh Wee Theng
	Pn. Khairi Shaharudin
	Cik Manonmani a/p Sinenuthu
	En. Mohd. Dali bin Silam
Volume and Flow Metrology	En. Ragavan Krishnan (In charge)
	En. Rahim Bin Saad
	Pn. Sharifah Norsiha Bt. Syed Kamal
	En. David Michael
	En. Zulkifli Bin Mat
	Cik Junaidah Bt. Ali
Electrical Metrology	En. Mohd. Zin Bin Hashim (In charge)
	En. Abd. Rashid Bin Zainal Abidin
	En. Mohd. Nasir bin Zainal
	Cik Nik Rahini bt. Nik Ishak
	En. Mohd. Nor Bin Hashim
	En. Shamsudin Bin Hanafi

LIST OF PROVISION OF EQUIPMENTS BY JICA

LENGTH

Date	Main Article	Quantity	Amount (1,000¥)	Remarks
Dec.82	Wedge Gauge Blocks	1 set	435	
do	Sine Bars	do	39	
do	Ultra Digital Electronic Comparator	do	3,820	
do	Outside, Inside Micrometer and Vernier Calipers	4 sets 2 pcs	215	
do	Dial Indicator	5 pcs	27	
do	Autocollimeter	1 set	498	
Feb.83	Standard Tape Measure	1 pc	85	
do	do	1 pc	108	
do	Gauge Blocks, Accessories	6 sets 10 pcs	874	
do	Magnetic Stands	2 pcs	15	
do	Calibration Tester	1 pc	87	
do	V-Block and Clamp	do	92	
do	Holtest	2 sets	374	
do	Hight Master	1 set	467	
do	Length Comparator	do	4,200	
do	Standard Line Rule	1 pc	113	
do	do	do	92	
May.84	1016 Millimeters Steel Bar	1 set	1,950	
do	Profile Projector	do	1,514	
Jan.85	3 Co-ordinate Measuring Machine	do	16,000	Domestic MS= purchase 100%
Feb.85	Toolmakers Microscope	do	491	do
do	Surface Roughness Tester	do	2,671	do
do	Granite Surface Plate	do	2,593	do
do	Mu-checker	do	241	do
do	Individual Gauge Block	do	366	do
do	do	do	300	do
Mar.85	Length Comparator	do	2,800	
do	Automatic Index Table	do	93	
do	Dodecahederal	do	494	
do	Autocollimeter	do	597	
do	Precision Levels	2 pcs	195	

Dats	Main Article	Quantity	Amount (1,000¥)	Remarks
May.85	Angle Measuring Rotary Table	1 set	4,494	
do	Universal Measuring Microscope	do	12,574	
do	Roundness Measuring Instrument	do	7,146	
do	Calibration Table of Tape Measure	do	9,500	
	Laser Measurement System	do	5,360	
	Zero-adjust Meter Handy Type	1 pc	97	
	Magnetic V-Block	1 pc	31	
	Magnetic Base	2 pcs	15	
	Optical Flat	1 pc	65	
	Thread Gauge	1 set	400	
	Block Gauge	8 pcs	498	
	Square	1 pc	76	
	Cylindrical Square	1 pc	86	
	V-Block	6 pcs	155	
	Metal Surface Plate	1 pc	67	
	Non-touch Displacement Measurement	1 set	4,180	
Sep.85	Taper gauge	1 set	240	
do	Training Kit	do	88	

86,918

Mass Metrology

Date	Main Article	Quantity	Amount (1,000¥)	Remarks
Dec.82	Standard Weights	2 pcs	514	
do	Direct Reading Micro Balance	1 set	783	
do	Table for Balance	do	113	
do	Proving Ring	2 pcs	992	
Feb.83	Balance and Set-Off Weights	1 set	2,376	
May.83	Standard Weights	do	5,854	
do	Direct Reading Balance	do	4,298	
May.84	do	do	1,100	
do	Universal Precise Weighting Scale	2 pcs	2,060	
Oct.84	Electronic Balance	1 set	526	
do	Direct Reading Balance	do	328	
Mar.85	Cleaning Goods for Balance	do	2	

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Date	Main Article	Quantity	Amount (1,000¥)	Remarks
Mar.85	Analitical Balance	1 set	266	
do	Chain Block	1 pc	26	
do	Nylon Sling	10 pcs	74	
May.85	Elastic Roop Dynamameter	1 pc	366	
do	Standarzing Box	do	704	
do	do	do	1,370	
do	Dead Weight Pressure Tester	1 set	2,936	
	Direct Reading Balances	do	1,936	
	Midget Fork Lift	1 car	420	
			(27,044)	

Temperature Metrology

Date	Main Article	Quantity	Amount (1,000¥)	Remarks
Dec.82	Standard Platinum Resistance Thermometer	1 pc	316	
do	do	do	363	
do	do	do	383	
do	Thermometer Bridge	1 set	4,453	
do	Standard Thermometer	do	620	
May.83	Vertical Calibration Furnace	do	2,450	
do	Oil Bath	do	3,200	
do	Temperature Control Unit	do	3,450	
do	Standard Platinum Resistance Thermometer	2 pcs	1,000	
do	Standard Thermocouples	4 pcs	1,600	
do	Digital Multimeter		2,400	
do	High Temperature Calibration Unit	1 pc	3,500	
do	High Temperature Furnace	do	5,100	
do	Standard Thermocouples	2 pcs	800	
do	Ice Point Unit	1 unit	90	
do	Cold Junction Unit	1 pc	400	
Apr.84	Panel Repairing Materials	1 set	1,512	

Date	Main Article	Quantity	Amount (1,000¥)	Remarks
May.84	Saltpoter Bath	1 set	5,501	
do	Sodium Nitrate Potassium Nitrate	50 Kg	50	
do	Precision D.C. Potentiometer	1 set	374	
do	Electronic Galvanometer	do	242	
do	Standard Cell	1 pc	44	
do	Thermocut	2 set	120	
do	Selector Switch	1 pc	61	
do	D.C. Volt Meter	do	53	
do	Vertical Pen Recorder.	1 set	490	
do	Battery	10 pcs	200	
do	H ₂ SO ₄	1 set	9	
do	Battery Charger	1 pc	44	
Sep.84	Cathetometer	1 set	370	
Mar.85	Digital Multi-Thermometer	2 sets	460	
do	Thermocouple	1 set	212	
do	Water Distillation Apparatus	do	267	
May.85	Temperature Fixed Point Cell Sn & Zn	do	3,022	
do	Silicon Narrow-Band Radiation Thermometer	do	1,931	
	Thermometer Testing Bath	do	1,800	
	Thermo - Couples	4 pcs	70	
	Resistance Thermometers	2 pcs	45	
	Surface Thermometer	2 sets	104	
	Stainless Bottle	1 pc	250	
	Standard Resister	3 pcs	163	
	Thermocouple for Zero Point	1 pc	240	
	Ceramic Protector	40 pcs	104	
Sep.85	Pocket Thermometer	4 pcs	100	
do	Micromanometer	1 pc	43	

46,521

Volume Metrology

Date	Main Article	Quantity	Amount (1,000¥)	Remarks
Dec.82	Specific Gravity Meter for L P Gas	3 pcs	306	
do	Measuring Cylinder for above	1 pc	160	
do	Pressure Hose for above	4 m	20	
do	JIS K2249 Reference	1 pc	9	
do	Insulation Tester	do	34	
do	LPG Technical Guide Book	1 pc	13	
Feb.83	Oval Movable Flowmeter Testing Equipments	1 unit	4,446	
do	Flexible Tube and Reducer	do	517	
May.83	Standard Tank 5 K1	1 pc	5,900	
do	do 2 K1	do	4,000	
do	do 500 1	do	2,100	
do	Accessories for Piping	1 unit	1,438	
May.84	Standard Wet Gasmeters	8 sets	3,757	
do	Standard Tank 200 1	1 pc	1,975	
do	Piston Prover for Gas	1 set	10,400	
do	Piston Prover for LPG	do	8,500	
do	Air Blower	1 pc	73	
Jul.84	Flow Standard Device	1 unit	4,114	
Mar.85	Rubber Hose 50 m X 2	100 m	210	
do	Gasmeter Test Equipment	2 sets	6,686	
do	Water Distiller	1 set	218	
do	Vacuum Pump	1 pc	155	
do	Magnet Pump	do	81	
do	See-through Wet-Type Gasmeter	do	237	
do	See-Through Dry-type Gasmeter	do	103	
do	Cutting Gasmeter	do	122	
do	Pipes, Reducers, Bend-Pipes, etc.	1 set	1,331	
	Water Pump	do	744	
	Additional Pipes	do	1,332	Domestic M\$= purchase 100%
	Electronic Total Counter	4 pcs	140	
	Aluminum Racks	5 sets	633	
	Tool Box	1 pc	44	
	Angle Cutter	1 set	88	
	Tester	2 sets	8	
			(59,894)	

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Electrical Metrology

Date	Main Article	Quantity	Amount (1,000¥)	Remarks
Dec.82	Standard Resister	18 pcs	2,722	
do	Voltage Standard	1 pc	1,094	
May.83	Electric Galvanometer	1 set	250	
do	Portable Standard Ammeter	1 pc	54	
do	D.C. Precision Current Supply	do	292	
do	Precision D.C. Potentiometer	do	381	
do	Decode Resistance Box	do	110	
do	Circuit Tester	do	29	
do	Precision Digital Multimeter	do	1,190	
do	Vertical Pen Recorder	2 sets	998	
do	Liquid Paraffin	15 cans	180	
do	Regulated AC Power Supply	3 sets	855	
do	do	1 set	735	
do	Transfermer	1 pc	35	
do	Slide Voltage Regulator	1 set	22	
do	Tools and Others		436	
do	Oil Bath	1 set	6,250	
May.84	DC Calibration Set	do	1,860	
do	Precision Double Bridge	do	440	
do	Build-up Resisters	do	1,573	
do	AC Power Calibration System	do	5,700	
do	Digital AC Power Meter	do	1,760	
do	Standard Cell Air Bath	do	3,361	
do	Digital Power Factor Meter	do	298	
do	Mercury Cup Stand	do	468	
do	Carring Case	do	4	
do	AC/DC Differential Voltmeter	do	2,070	
do	Rack for Fuluke	do	762	
do	Reference Standard Capacitor	2 sets	1,568	
do	Precision RLC Digibridge	1 set	1,680	
do	Null Detector Fuse for HP419A	do	3	
do	DPDT Pinch Type Switch	1 unit	60	
do	Battery Charger	do	230	
do	PC 101 Parallel Compensation Network	1 set	971	
	/3 SPC 102 Series Parallel Compensation Network / 3			

Date	Main Article	Quantity	Amount (1,000¥)	Remarks
May.84	Accessaries and others		480	
Sep.84	Standard Resister	7 sets	1,137	
Mar.85	Sealed Wire and others		471	
do	Thermal Transfer Standard	1 set	2,000	
do	Cable for Fuluke	do	61	
do	DC Reference Standard	do	632	
do	Liquid Paraffin	30 cans	381	
do	DC Calibration Set	1 set	239	Domestic Mi- purchase 100¥
do	Multi Channel Recorder	do	94	do.
do	AC Calibrator Set	do	350	do
do	Temperature Sensors	2 pcs	29	do
May.85	Accessaries for Capacitance Bridge	1 set	791	
do	Frequency Synthesizer	do	1,224	
do	Pulse / Function Generator	do	980	
	Potentiometer Facility	do	8,700	
	Rubidium Frequency Standard	do	2,580	
	Universal Counter	do	1,725	
	Digital Electrometer	do	1,690	
	Standard Resistance Box	10 pcs	870	
	Kelvin-Varley Voltage Divider	1 set	1,996	
	Frequency Difference Meter	do	1,935	
	Diverter	5 pcs	59	
	Potentiometer	1 pc	185	
	Change over Switch	1 pc	55	
	DC Electric Power	1 set	2,960	
	AC Electric Power	do	3,440	
			(73,505)	

General

Date	Main Article	Quantity	Amount (1,000₹)	Remarks
Dec.82	Thermo-Hygrograph	1 set	625	
do	Multi-Tester	1 pc	45	
do	AC Volt Recorder	1 set	260	
do	Caliper	1 pc	9	
do	Slide Voltage REGulator	3 pcs	54	
do	Measuring Tape	1 pc	2	
do	do	do	3	
do	Desicator	2 pcs	100	
do	Hand Tool Set	2 sets	75	
do	Camera and Accessories	1 set	205	
do	Refrigerator	do	215	
do	Stationery	do	982	
do	Typewriter	do	615	
do	Copy Machine and Accessories	do	1,447	
do	Cassette Recorder and others	do	146	
do	Station Wagon	1 set	1,437	
Jan.83	Video Tape Recorder	do	1,242	
do	Over Head Projector	do	303	
do	Books	1 set	322	
Dec.83	Diflon Solvent and others	do	295	
do	Stationery and others	do	121	
Jul.84	Stationery and Hand Tools	do	182	
Sep.84	Books and Stationery	do	388	
Sep.85	Books		30	
			9,103	

	Amount (1,000₹)
Length Metrology	86,918
Mass Metrology	27,044
Temperature Metrology	46,521
Volume Metrology	59,894
Electrical Metrology	73,505
General Materials	9,103

Total 302,985

Note : This total is made up as of September 27, 1985.

DISPATCHED JAPANESE EXPERTS FOR THE S.I.R.I.M.

Name (Field)	Staying Period in Malaysia	Month	FY 81/82	FY 82/83	FY 83/84	FY 84/85	FY 85
Chief Adviser							
1. S. Iwasaki	26.07.82 - 25.07.84	24.0		—————			
2. K. Nagashio	07.07.84 - 24.12.85	17.5				—————	
Long Term Experts							
3. T. Kawasaki (M,V)	01.10.82 - 16.12.85	38.5		—————			
4. K. Murakami (E)	12.12.83 - 16.12.85	24.0			—————		
5. A. Kurobe (M,E)	05.09.84 - 16.12.85	15.3				—————	
Short Term Experts							
6. S. Tomita (M)	01.02.83 - 31.03.83	2.0		—			
7. K. Nagashio (V)	01.02.83 - 30.04.83	3.0		—			
8. K. Murakami (E)	01.02.83 - 30.04.83	3.0		—			
9. Y. Kobayashi (M)	13.01.84 - 26.02.84	1.5			—		
10. K. Nakase (E)	13.01.84 - 12.03.84	2.0			—		
11. T. Terada (m)	13.01.84 - 25.01.84	0.4			—		
12. M. Hosaka (V)	03.02.84 - 10.03.84	1.2			—		
13. Y. Yamaguchi (m)	02.12.84 - 07.12.84	0.2				—	
14. Y. Yokoyama (L)	11.01.85 - 10.03.85	2.0				—	
15. H. Itoh (T)	22.01.85 - 20.04.85	3.0				—	
16. T. Yamazaki (E)	22.01.85 - 20.03.85	2.0				—	
17. S. Hatsui (m)	09.06.85 - 19.06.85	0.3				—	
18. M. Morimoto (m)	16.09.85 - 30.09.85	0.5				—	
19. K. Neda (T)	25.09.85 - 24.10.85	1.0				—	
20. M. Horita (L)	25.09.85 - 08.11.85	1.5				—	
21. G. Yonezaki (m)	15.10.85 - 29.10.85	0.5				—	
22. T. Yamazaki (E)	15.10.85 - 14.11.85	1.0				—	
23. (m)	11.85 - 11.85	0.3				—	
Total 23 person		144.7					

Note; (L): Length Metrology
(M): Mass Metrology
(T): Temperature Metrology
(V): Volume Metrology
(E): Electrical Metrology
(m): Maintenance or Installation

JICA MISSIONS DISPATCHED FOR THE PROJECT

- | | | |
|----|--|---|
| 1. | Preliminary Survey Team
Susumu Iwasaki
Hiroyuki Hirayama
Keiichi Nagashio

Masahiro Kumagaya
Naoki Koono | Jul. 13 - Aug. 1, 1981
Team Leader
Electric Standard
Other Standards except Electric Standard
Technical Cooperation
Coordination |
| 2. | Implementation Survey Team
Susumu Iwasaki
Hiroyuki Hirayama
Tomoki Kawakami
Makoto Nakamura
Naoki Koono | Dec. 6 - Dec. 12, 1981
Team Leader
Electric Standard
Metrology Standard
Technical Cooperation
Coordination |
| 3. | Consultation Team
Hideki Uchiyama

Takashi Igarashi
Yuuji Endou
Naoki Koono | Mar. 7 - Mar. 21, 1983
Team Leader Other Standards
except Electric Standard
Electric Standard
Technical Cooperation
Coordination |
| 4. | Technical Guidance Team
Hideki Uchiyama
Tooru Yamazaki
Yutaka Yamazaki | Jun. 20 - Jun. 30, 1984
Team Leader Other Standards
Electric Standard
Coordination |
| 5. | Equipment Repair Team
Hidefumi Nishinaka
Shigeaki Amano
Sanetoshi Sekiya
Yutaka Yamazaki | Feb. 27 - Mar. 10, 1985
Voltage Standard Calibration
Calibration for High Temperature
Repair for Standard Gas meters
Coordination |
| 6. | Evaluation Team
Toshio Kitamura
Shinichi Ueyama
Susumu Iwasaki
Mitsuaki Takeda
Katsutoshi Shiozawa | Sep. 28 - Oct. 6, 1985
Team Leader
Management Operation
Technical Cooperation
Technical Cooperation
Coordination |

TRAINED SIRIM PERSONNEL IN JAPAN

Name of Trainee (Field)	Staying Period in Japan	Days	FY 81/82	FY 82/83	FY 83/84	FY 84/85	FY 85
1. Ragavan Krishnan (V)	07.12.82 - 20.01.83	45		-			
2. Hafidzah Othman (E)	07.12.82 - 03.02.83	59		-			
3. David Michael (V)	21.03.83 - 20.04.83	31		-			
4. Abdul Jalil (T)	01.12.83 - 14.03.84	104			-		
5. Mohd. Nor Hashim (E)	01.12.83 - 14.03.84	104			-		
6. Sharifah Norsiha (V)	11.02.84 - 14.05.84	93			-		
7. Ahmad Makinudin (M)	04.10.84 - 21.01.85	110				-	
8. Yeoh Wee Theng (T)	04.10.84 - 21.01.85	110				-	
9. Abd. Rashid Zainal (E)	04.10.84 - 21.01.85	110				-	
10. Rahim Saad (L)	04.07.85 - 22.09.85	81					-
11. Nik Rahini (T)	04.07.85 - 22.09.85	81					-
12. Mohd Mansor (I)	27.07.85 - 08.08.85	10					-
Total 12 person		938					

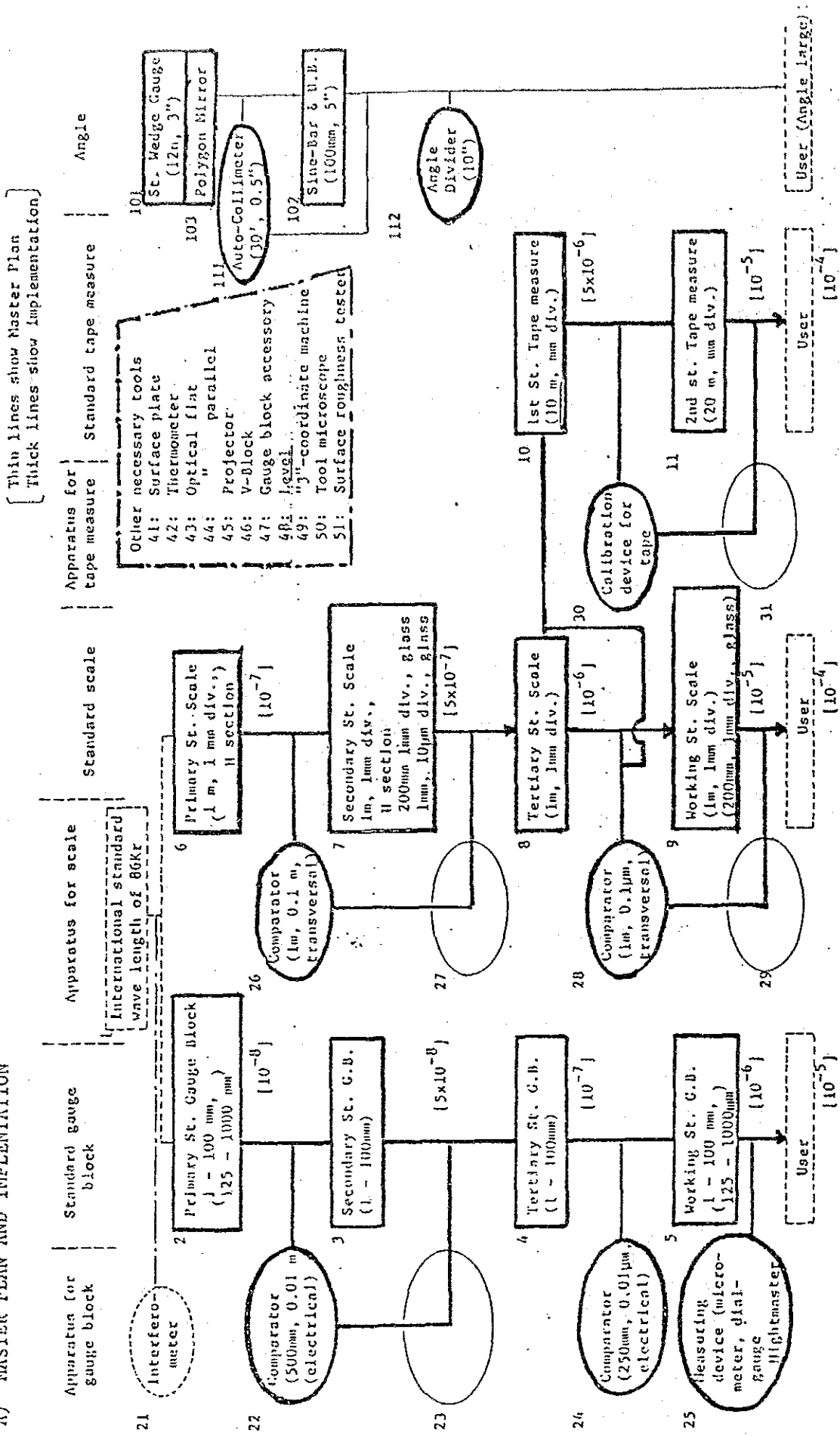
Note;

- (L): Length Metrology
- (M): Mass Metrology
- (T): Temperature Metrology
- (V): Volume Metrology
- (E): Electrical Metrology
- (I): Inspection

ANNEX VII

A) MASTER PLAN AND IMPLEMENTATION

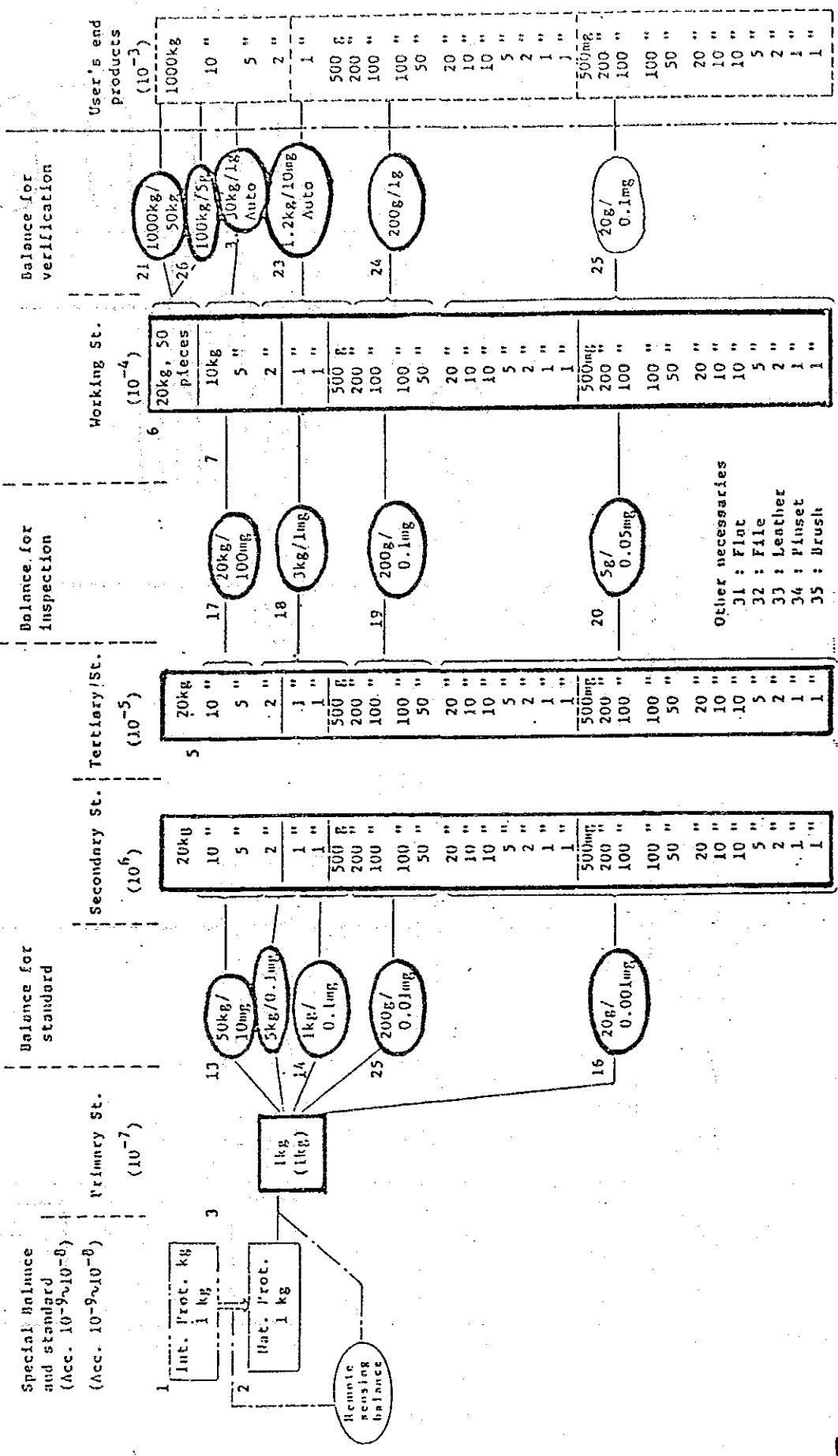
LENGTH



A) MASTER PLAN AND IMPLEMENTATION

MASS

Thin lines show Master Plan
Thick lines show implementation



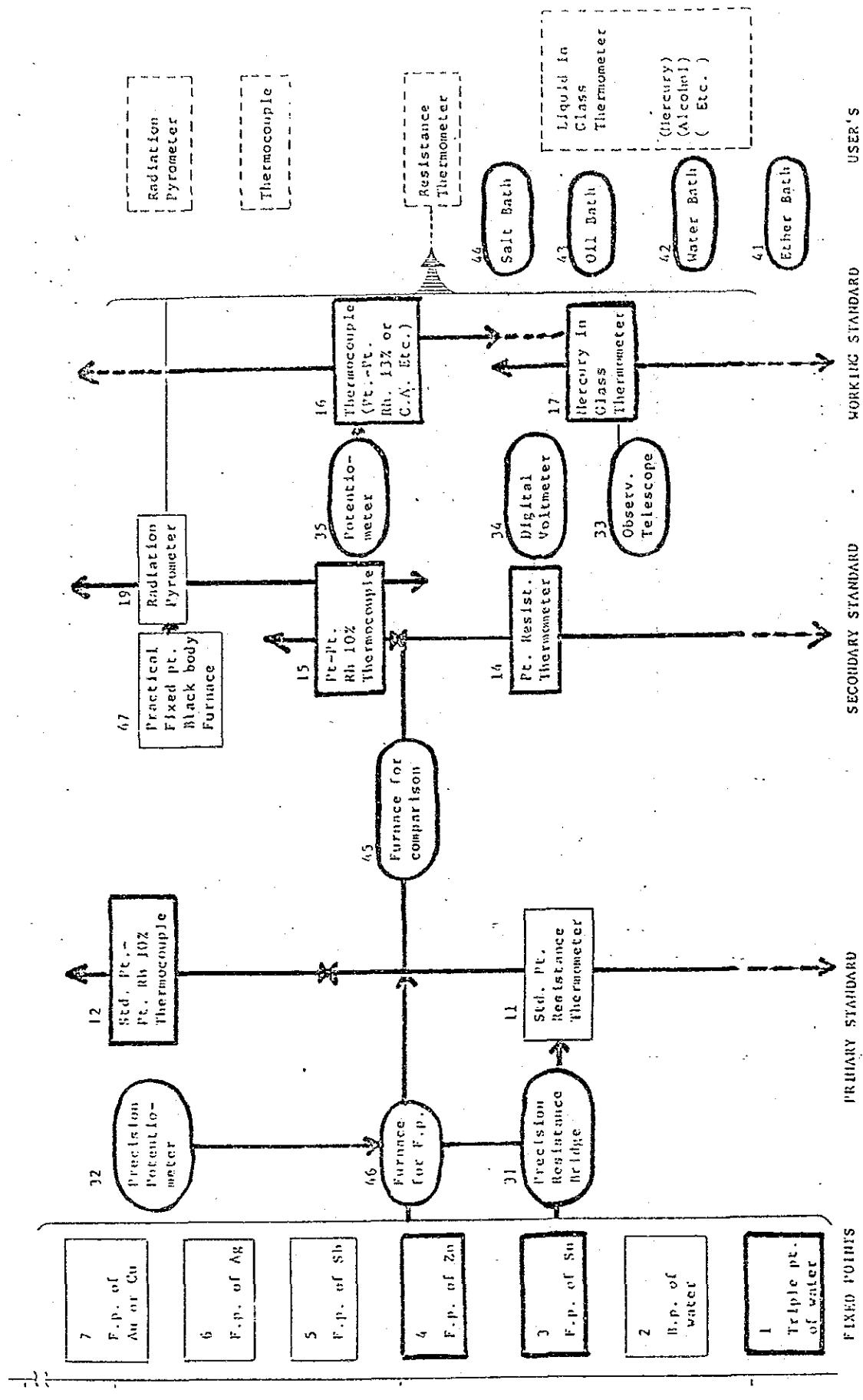
(mark : standard weight, mark : balance (Equipment))

FA

A) MASTER PLAN AND IMPLEMENTATION

TEMPERATURE

Thin lines show Master Plan
 Thick lines show Implementation



FIXED POINTS PRIMARY STANDARD SECONDARY STANDARD WORKING STANDARD USER'S

F.p. Freezing Point

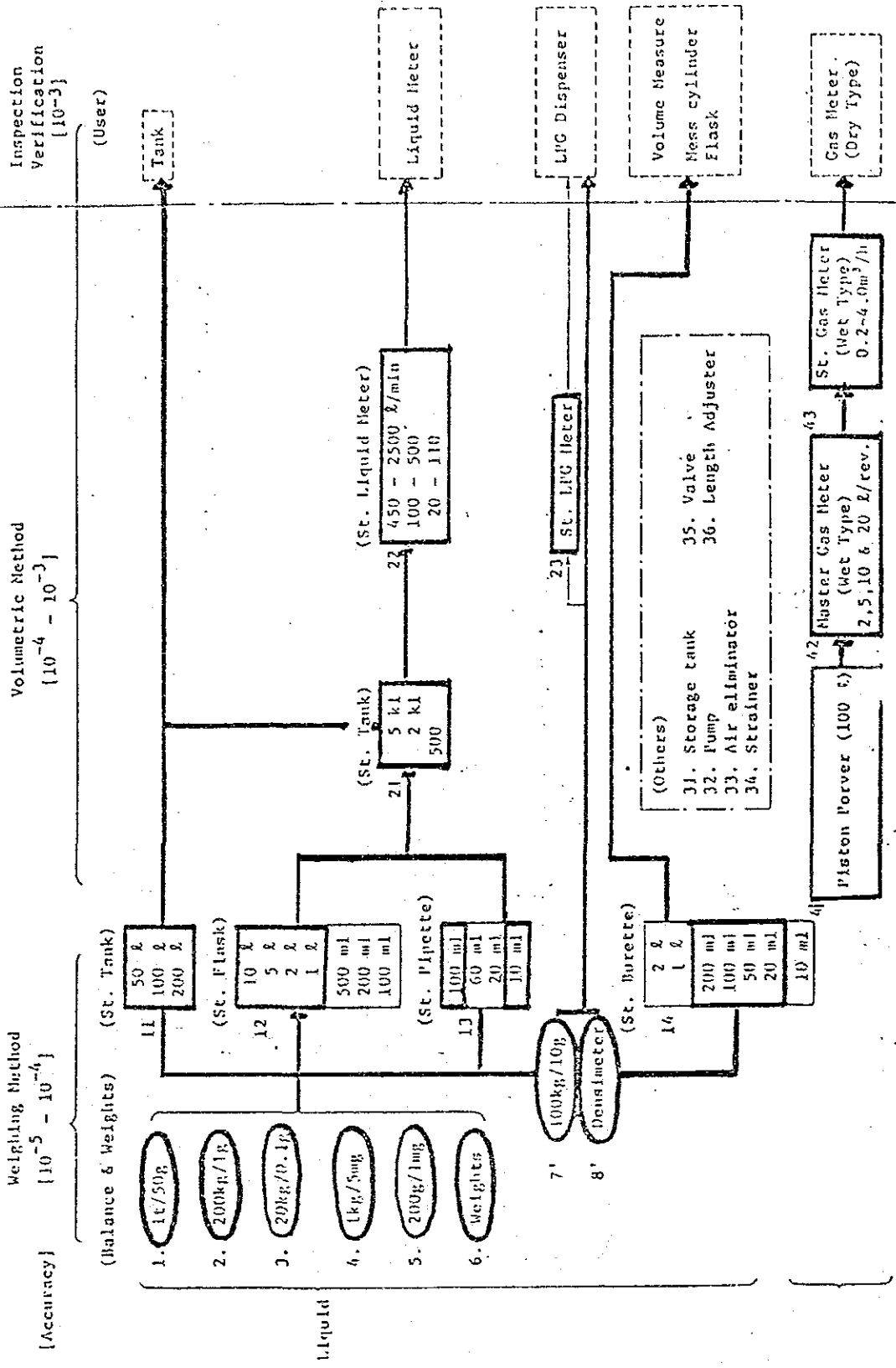
TEMPERATURE/C

47

VOLUME

A) MASTER PLAN AND IMPLEMENTATION

Thin lines show Master Plan
Thick lines show implementation

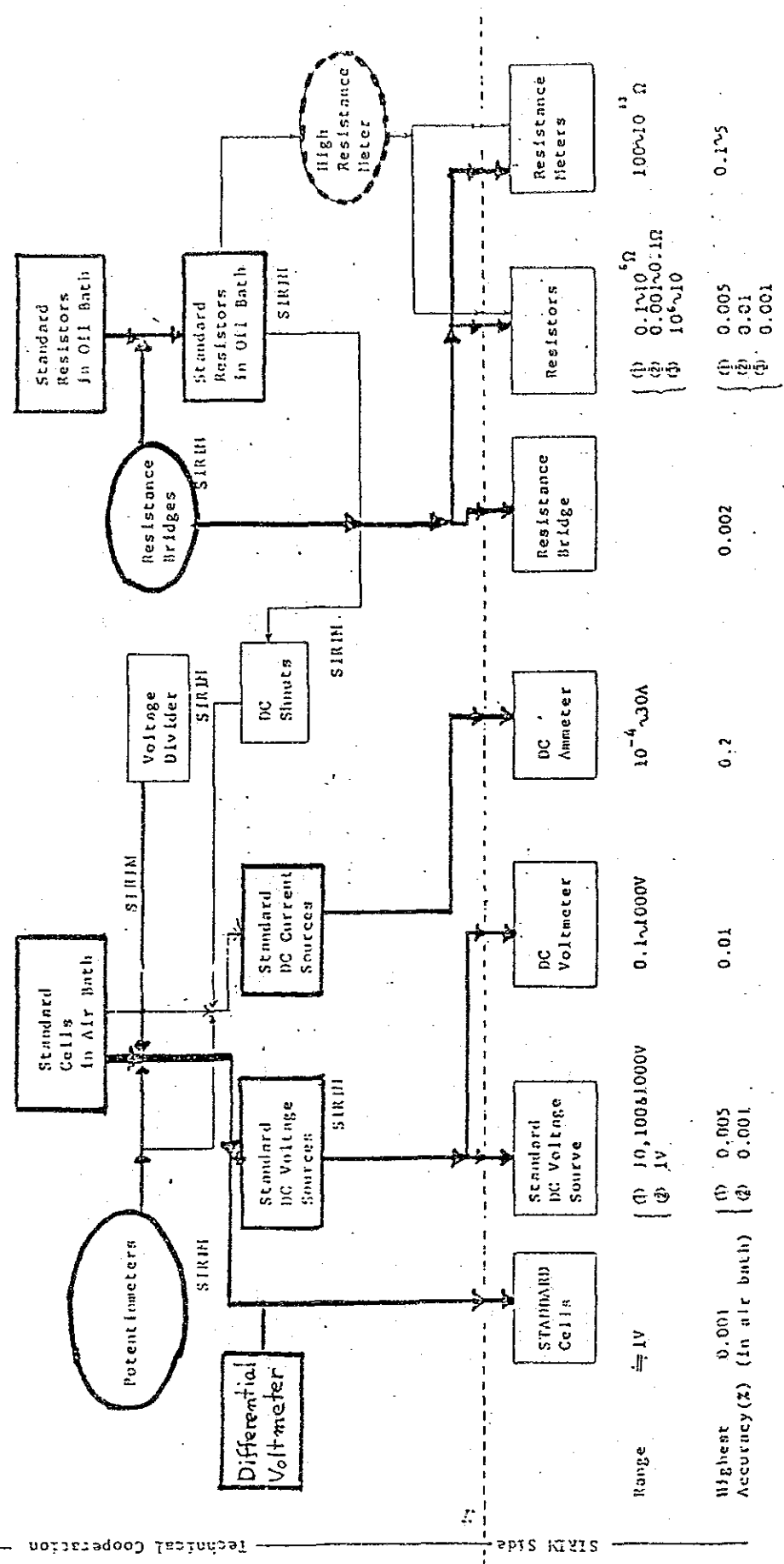


24

A) MASTER PLAN AND IMPLEMENTATION

ELECTRICITY (DC)

Thin lines show Master Plan
 Thick lines show Implementation
 SIRIM shows the standards or equipments
 provided by SIRIM



5

PHASE		Preparation, Basic Establishment			Development			REMARKS
JAPANESE FISCAL YEAR		1981	1982	1983	1984	1985		
MALAYSIAN FISCAL YEAR		1981	1982	1983	1984	1985		
ITEMS								
MALAYSIAN SIDE	Building Construction						■ Plan in Tentative Schedule of Implementation □ Actual Implementation	
JAPANESE SIDE	Dispatch of Survey Team	Preliminary Survey Team Implementation Survey Team Consultation Team Technical Guidance Team Equipment Repair Team Evaluation Team						One line represents one expert. (One person may cover other fields concurrently if possible)
	Dispatch of Japanese Experts	Long-Term Experts Chief Advisor (Length and Temperatures) Technical Advisor (Volume and Mass) Short-Team Expert Length Mass Temperature Volume Electricity Installation and Maintenance					Electricity Mass and Electricity	
	Training of Malaysian Counterpart Personnel in Japan	Length Mass Temperature Volume Electricity Inspection						



THE MINUTES OF MEETING BETWEEN THE JAPANESE
EVALUATION TEAM AND THE AUTHORITIES CONCERNED
OF THE GOVERNMENT OF MALAYSIA ON THE JAPANESE
TECHNICAL COOPERATION FOR THE PROJECT ON THE
NATIONAL METROLOGY LABORATORY OF STANDARDS AND
INDUSTRIAL RESEARCH INSTITUTE OF MALAYSIA

The Japanese Evaluation Team (hereinafter referred to as "The Team"), organized by the Japan International Cooperation Agency (hereinafter referred to as "JICA") visited Malaysia from September 28 to October 5, 1985, exchanged views and had a series of discussions with the authorities concerned of the Malaysian side for the purpose of evaluating the achievements of Japanese technical cooperation for the project on the National Metrology Laboratory of Standards and Industrial Research Institute of Malaysia (hereinafter referred to as "the project").

As a result of the joint evaluation work and discussions, both sides reached the following conclusions.

1. Most activities programmed in the Record of Discussions and other pertinent papers have been almost completed.

These are largely due to the efforts of Malaysian counterparts with the cooperation of the JICA experts and managements of JICA and SIRIM.

2. It has been noted that all assigned experts and Malaysian counterparts showed genuine interest and exerted all efforts for the eventual self-reliant operation of the Project.

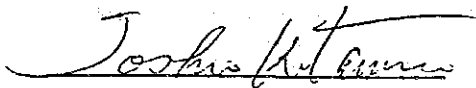
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(8)

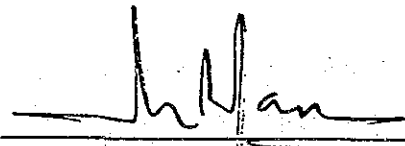
3. However the arrival of equipments for length metrology to be donated is behind schedule.

In view of the above, both sides agreed to recommend to their respective Governments that it is still necessary to follow up the cooperation for about two and half (2.5) months from December 17, 1985 to February 28, 1986 and to implement the cooperation mentioned in Annex-I.

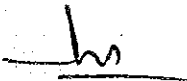
Kuala Lumpur October 3, 1985.



Mr. Toshio Kitazura
Leader,
Japanese Evaluation Team,
Japan International
Cooperation Agency,
Japan



Dr. Mohd. Mansor bin Haji Salleh
Controller,
Standards and Industrial Research
Institute of Malaysia,
Ministry of Science, Technology
and Environment, Malaysia



JICA