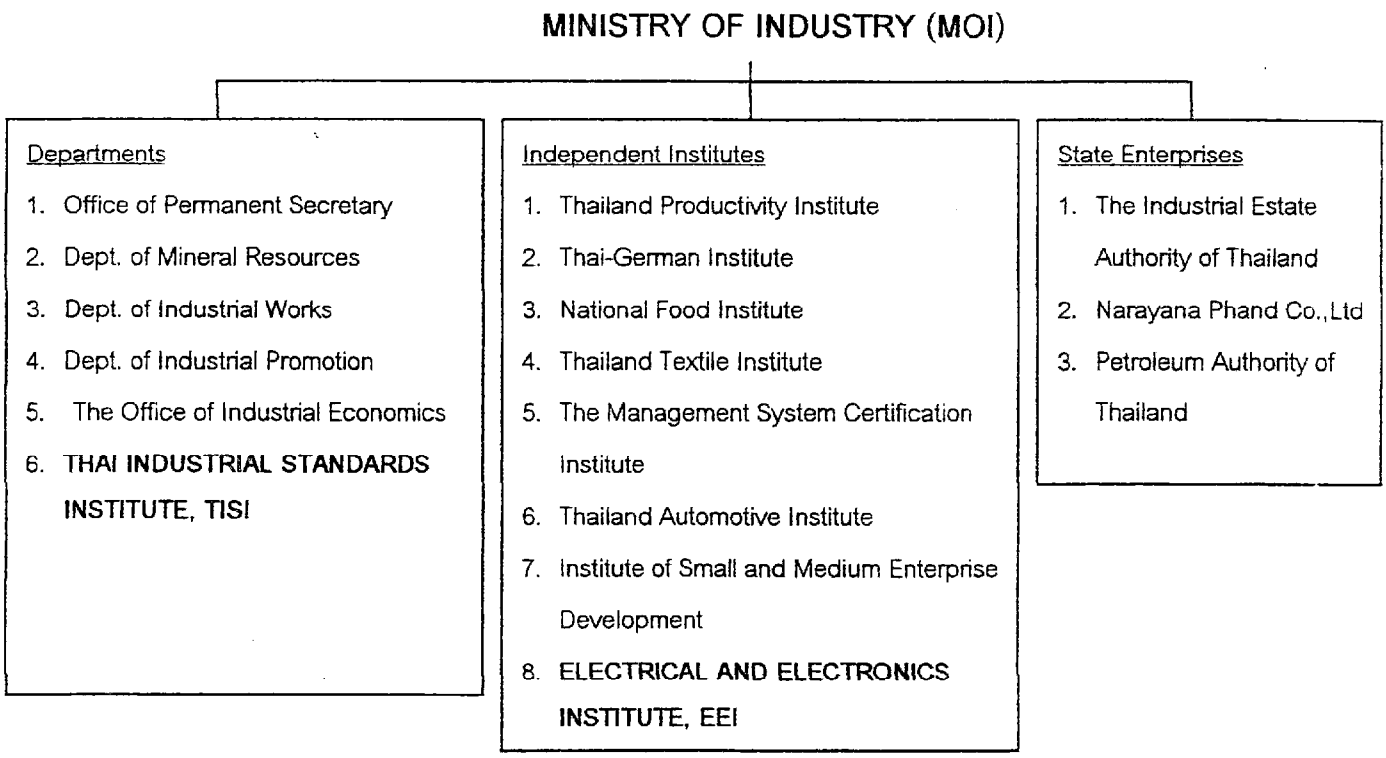
3．第１回質問状に対する回答書

I. Organization and other related issues about TISI and EEI

(1) Organization and staff allocation

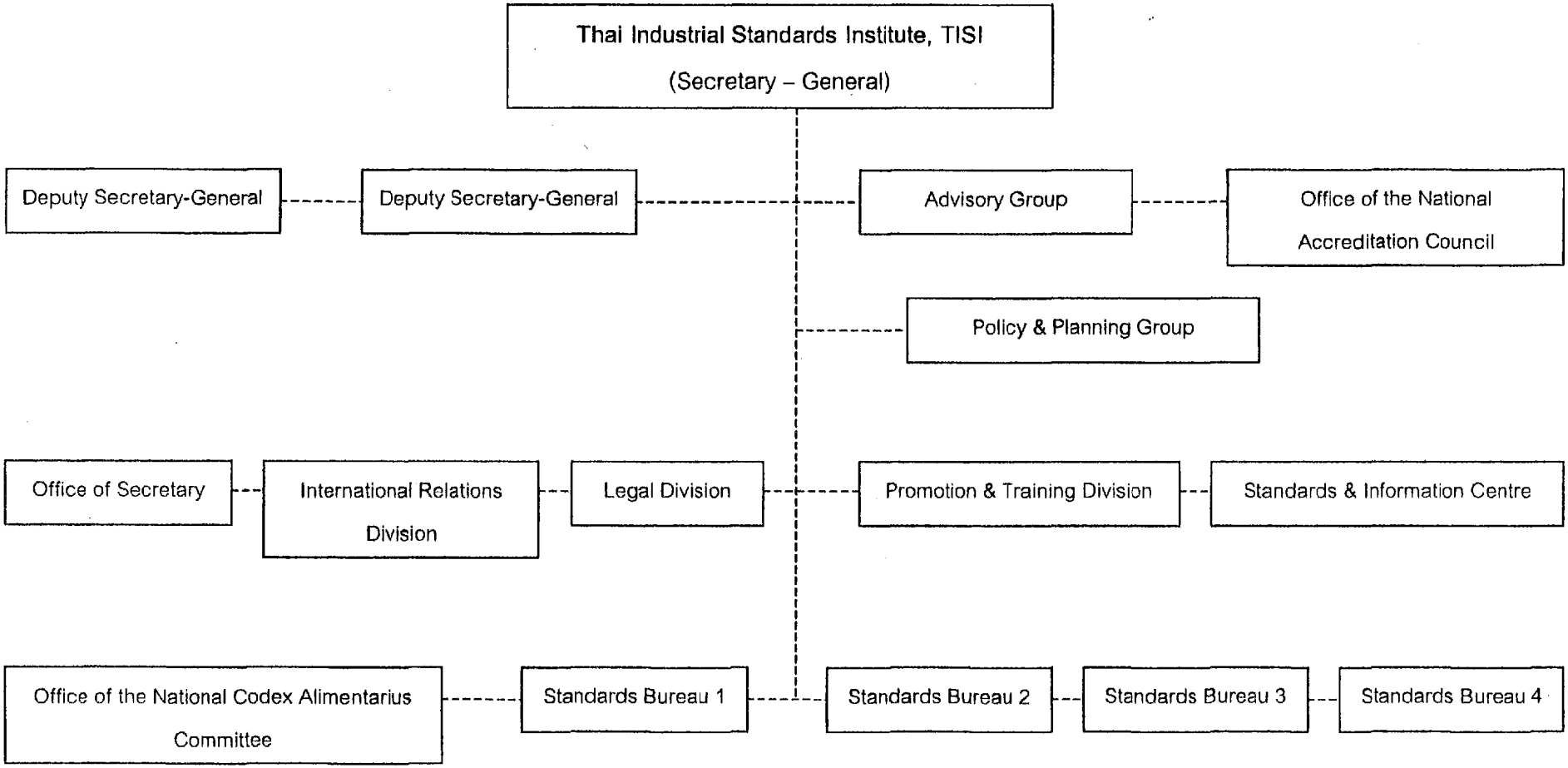


Ministry of Industry consists of six departments, eight Institutes, and three state enterprises. TISI is one of the government departments and EEI is an independent and non-profit organization provisioned by the Industrial Development Foundation, Ministry of Industry.

In order to focus on the policy-making, budget planning and distributing and monitoring, the MOI had promoted EEI and other institutes, MOI now transfers some of its activities to those institutes for implementing and working closely to the industries.

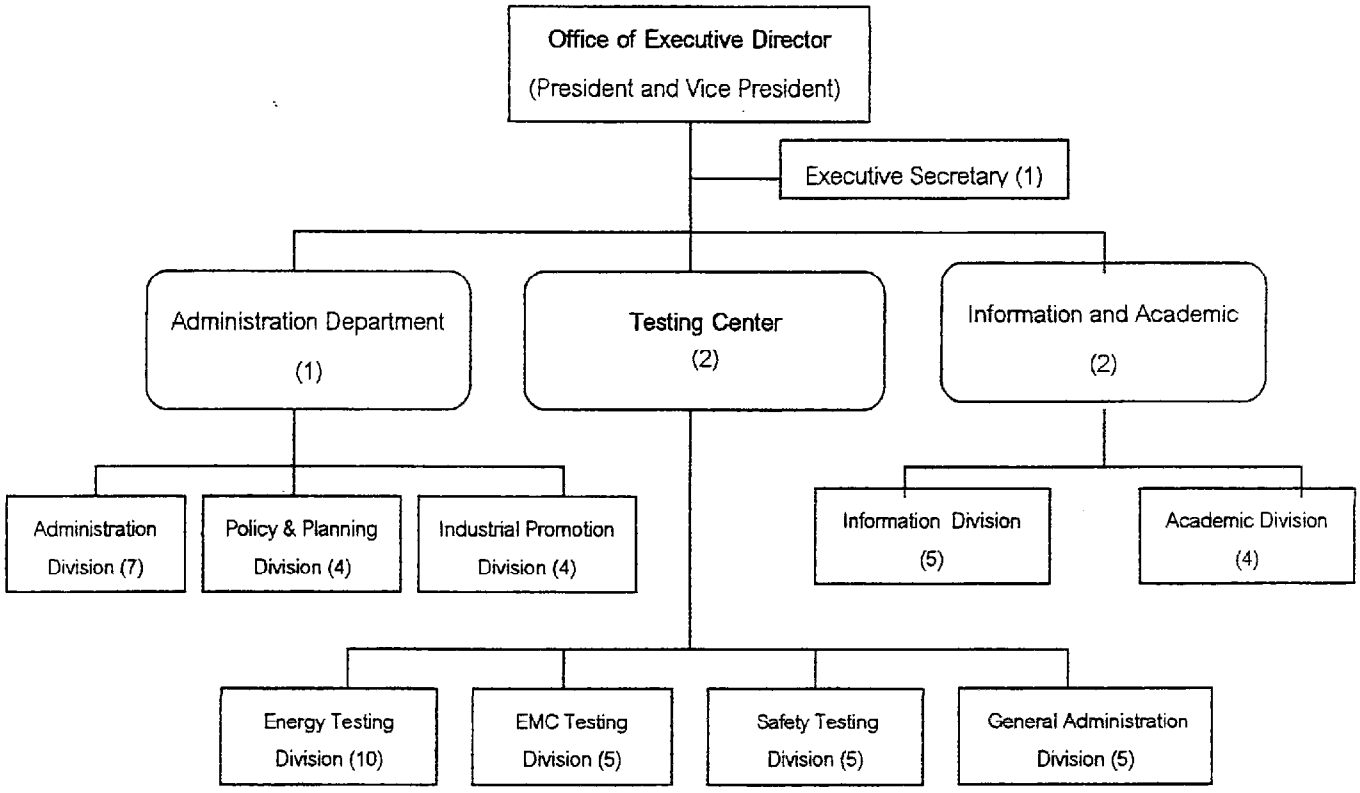
TISI is the national standards body for Thailand, established by virtue of the Industrial Product Standards Act B.E. 2511 (1968) . According to the Act, the governing body for TISI is the Industrial Product Standards Council. The Council is responsible for policy making, sets the priority of standards to be prepared, recommends qualified for the Minister to appoint to technical committee, arbitrates and awards licenses under its certification scheme.

(a) Organization Chart of TISI



EEI was establishes by the MOI with the approval of the cabinet on 7 July 1998 in order to strengthen the competitiveness of Thai electrical and electronics industry in the international market.

(b) Organization Chart of EEI and Staff Allocation



( ) denotes number of staff

(c) Relations of EEI and TISI with other governmental organizations in Thailand

Not only the Ministry of Industry which EEI has closely cooperated, but also other government organizations, for example :-

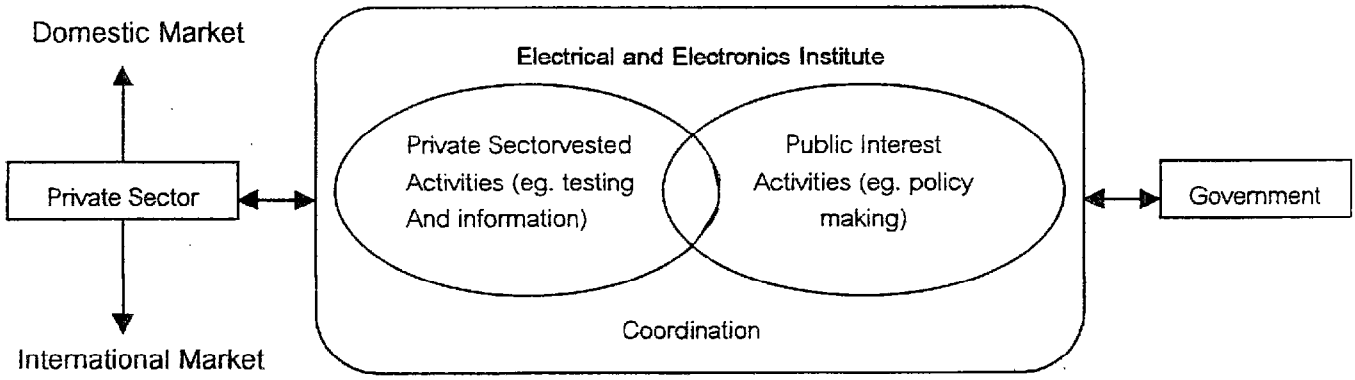
Cooperating with BOI (Board of Investment) to facilitate the transaction process of importing raw materials for the manufacturers.

Coordinating with Foreign Trade Department, Ministry of Commerce, to organized the seminar and analytical study on the impact of EU Directives, Waste from Electrical and Electronics Equipment (WEEE), on the Electrical and Electronics industry.

(d) **Degree of corporation (denationalization) of EEI**

EEI has its own mission to the development of electrical and electronics industry. The government policy has been implementing in addition to EEI's policy, which iis partly supported. In order to achieve the principal mission of the institute, EEI has good coordination between private sectors and the government as depicted in the following diagram.

Private Sector and the Government Under EEI Umbrella



(e) **Present positions and activities of the former counterpart personnel of the Project (Annex 1)**

Due to the Project Type Technical Cooperation of JICA, TISI Testing Center had terminated before the Testing Center had been transferred to EEI. As a result, the information of the former counterpart personnel is not available.

(2) Function, placement and activities

(a) Function and placement of EEI in Thailand

EEI is managed and operated under the provision of the EEI Board, chaired by the MOI Permanent Secretary, and representatives of the government sector the private sector and distinguished experts as members of the committee. The function and responsibilities of EEI initially set by the board are as follows:-

1. Providing quality, safety and environmental testing for electrical and electronic products.
2. Providing information on production technology, and trade.
3. Coordinating and cooperates with the government and private sectors at domestic and international levels to develop the industry and its related businesses as well as to improve knowledge and skills of the workforce.
4. Conducting relevant studies in order to make recommendations on policies, plan and measures for developing and solving problems on the industry.

(b) Placement of EEI in TISI

The EEI executes testing and certification services based on Thai Industrial Standards Act 1968. These activities were directly transferred from TISI since November 1999. The activities cover the following areas.

1. Safety testing of electrical and electronics products and parts based on TISI Standards
2. Compulsory standards testing required by TISI
3. Voluntary standards test. The EEI conducts testing services for voluntary standards to satisfy the demand from private sector for their export, import and manufacturing.
4. CE-Marking Test. The EEI conduct the testing services based on EU Directive, which are essential factors for CE-Marking.

EEI arrange mutual recognition agreements (MRA) on electrical and electronics products and proposes the national standards of electrical and electronics products through TISI.

(c) **Function of EEI in national development plan of Thailand**

In January 1998, the Government of Thailand has announced its Cabinet approval of the "Industrial Restructuring Plan, IRP" proposed by the MOI. The purpose of IRP was to cope with the Thai's economy recession through the improvement of Thai's international competitiveness and export expansion, and the "Concept for Institutional Building" was one of the means to execute IRP's action plans. EEI had been executed the "Supplier Development Program" and was assigned to look into the "International Procurement Office Program (IPO)".

(d) **Basic guidelines of activities of EEI and TISI**

Basic guidelines of activities of EEI

- Policy Making and Planning Support
- Industrial Promotion
- Transaction Services
- Testing and Calibration
- Information Services
- Academic Services

Activities of TISI

- Standards Development
- Certification of Conformity
- Laboratory Accreditation
- International Cooperation
- Standardization Promotion
- Standard Information Service

(e) Relations with other bi-lateral and multilateral aid agencies, which had assisted, and will assist EEI

- The government of Australia had approved a technical cooperation in the field of Energy Saving by dispatching the experts to EEI in the year 2001.
- With cooperation of the Bureau of Supporting Industries Development (BSID), Department of Industrial Promotion, the Government of Federal Republic of Germany shall establish of Joint Information Center (JIC) in order to promote the business development service networks for SME in Thailand. EEI is in the JIC working group.

(3) Budgetary condition

For five years starting 1999, the EEI will receive a total of 100 million bahts. This five-years budget was considered to be an initial setting-up budget. Afterward, the EEI can ask for supporting budget to compensate their additional investment and operational cost.

(4) Activities

(a) Testing Activities (see Annex 4)

(b) Training Courses (see Annex 5-1, Annex 5-2)

(c) Counseling Services (see Annex 6)

(d) Other Main Activities (see Annex 7)

II Contents of the Aftercare Program

(1) Taking additional care of the machinery and equipment already provided by the Government of Japan

(a) Name, specification, maker, date of provision, and present condition
(see Annex 8)

(b) Necessity of spare parts and consumables to be provided by JICA, and availability of spare parts and consumables in Thailand and the quotations
(see Annex 9)

(c) Necessity of repairs by Japanese experts
(see Annex 10)

(2) Supplementary technical cooperation within the scope of R/D

(a) The themes within the scope of R/D which need supplementary technical cooperation by the Japanese short-term experts and detail contents of the task for the said experts
(see Annex 11)

(b) Name, quantity, specification, maker, reason of necessity, availability in Thailand and quotation of the machinery and equipment needed to be provided in order to transfer the technology on the said themes
(see Annex 12)

(c) Plan for assignment of the Thai counterpart personnel for the Aftercare Programme; Number, name and age, sex, their present position and their qualification
(see Annex 13)

ANNEX 1 (Data is not available)

LIST OF FORMER COUNTERPART PERSONNEL OF THE PRESENT POSITION AND ACTIVITIES

NO	NAME	AGE	SEX	PRESENT POSITION	PRESENT ACTIVITIES	REMARKS

ANNEX 2

BUDGETARY CONDITION OF FTU FOR THE IMPLEMENTATION THE AFTERCARE PROGRAMME

a. Settlement Accounts from 1993 Thai fiscal year to 1997

Investment for Testing Equipment

Unit : baht (million)

	1995	1996	1997	1998	1999	2000
Budget of TISI	N/A	N/A	N/A	N/A	N/A	N/A
Budget of EEI	-	-	-	-	6.1	7.8

b. Budget from 2001 Thai fiscal year to 2003

Unit : baht (million)

	2001	2002	2003
Budget of TISI	N/A	N/A	N/A
Budget of EEI	3.5	1.5	-

c. Perspective of defrayal of local cost expenses for the implementation of the Aftercare Programme by EEI

(a) expenses for the internal transportation for the machinery and equipment to be provided by Japan

Baht : 200,000

(b) expenses for the supply of the machinery, the equipment and other materials necessary for the Aftercare Programme other than provided by Japan.

Baht : 300,000

(c) All the other running expenses for the Aftercare Programme

Baht : 200,000

ANNEX 3

MAIN EQUIPMENTS PROVIDED AND MAIN PLAN OF INSTALLING EQUIPMENTS BY THAI SIDE 1/2

Date of Provision	Name	Specification	Marker	Operation(*1) Problems if any	Maintenance(*2) Problems if any	Remarks
1995	Hot line coil resistance metre	acc. to IEC 60335	SOKEN ELECTRIC	A	A	
1996	Operation under overload condition test apparatus	acc. to TIS 366	Special order	B	B	
1996	High speed tension tester	acc. to TIS 11	DEAYEONG	B	B	
1997	Plug and socket-outlet endurance tester	acc. to TIS 166		B	B	
1997	Life test rack for incandescent lamp	acc. to TIS 4	Special order	A	A	
1997	Life test rack for fluorescent lamp	acc. to TIS 236	Special order	A	A	
1998	Temperature & humidity chamber	acc. to IEC 60335	SANYO	A	A	
1998	EMC test chamber	acc. to CISPR16	TDK	A	A	
1999	EMC measuring equipment	acc. to CISPR16	HP	A	A	
2000	Life test rack for Incandescent lamp	acc. to TIS 4	Special order	A	A	
2000	Life test rack for fluorescent lamp	acc. to TIS 236	Special order	A	A	
2000	Cooling tower for calorimeter	acc. to TIS 1155	Special order	A	A	
2000	Temperature recorder	acc. to IEC60335	YOKAGAWA	A	A	
2000	Nozzle for water protection test	acc. to IEC60335	Special order	A	A	

(*1)	A: Operate more than three(3)times in a week	C: Operate a few times in a month
	B: Operate one (1) or two (2)times in a week	D: Hardly operate since the termination

(*2)	A: Maintain regularly	C: Hardly maintain (operation now)
	B: Maintain sometimes	D: Need to repair (stopping now)

ANNEX 3

MAIN EQUIPMENTS PROVIDED AND MAIN PLAN OF INSTALLING EQUIPMENTS BY THAI SIDE 2/2

Date of Provision	Name	Specification	Marker	Operation(*1) Problems if any	Maintenance(*2) Problems if any	Remarks
2000	Water bath	acc. to TIS 11	Special order	A	A	
2000	Voltage regulator	acc. to IEC 60335	Special order	A	A	
2000	Click noise analyzer	acc. to CISPR14	SCHAFFNER	A	A	
	for IEC60065					
(2001)	Surge generator					
(2001)	Ionization meter					
(2001)	Laser radiation tester					
(2001)	Touch current measuring equipment					
(2001)	Impulse test generator					
	for IEC 60950					
(2001)	Color/pattern generator					
(2001)	Signal and pink noise generator					
(2001)	Band-pass filter for noise measurement					
(2001)	Discharge meter					
(2001)	High voltage probe					

(*1)	A: Operate more than three(3)times in a week	C: Operate a few times in a month
	B: Operate one (1) or two (2)times in a week	D: Hardly operate since the termination

(*2)	A: Maintain regularly	C: Hardly maintain (operation now)
	B: Maintain sometimes	D: Need to repair (stopping now)

ANNEX 4

1. TESTING ACTIVITIES

Unit : Set

Testing for	1995	1996	1997	1998		1999		2000	
				TISI	EEI	TISI	EEI	TISI	EEI
Standards Development									
Product Certification									
Surveillance									
Private Sector									
Total	**592**	**576**	**664**	**737**	-	**611**		-	**1,058**

2. Record of Electrical and Electronics Appliances Testing at EEI

Unit : Set

Year / Appliance	1998	1999	2000	2001 (Target)	2002 (Target)	2003 (Target)
Energy Division	-	-	600	850	895	950
Safety Division	-	-	265	315	350	395
EMC Division	-	-	150	135	155	170
TOTAL	-	-	**1,025**	**1,300**	**1,400**	**1,515**

ANNEX 5-1

TRAINING ACTIVITIES IN TISI AND EEI

Unit : Courses

Year	TISI		EEI	
	Target	Actual	Target	Actual
1999	N/A	N/A		303*
2000	N/A	N/A	25	25
2001	N/A	N/A	10	
2002	N/A	N/A	12	
2003	N/A	N/A	15	

* Supplier Development Program

ANNEX 5-2

LIST OF TRAINING COURSES IN EEI FROM 1999 TO 2000

No.	Date	Theme	Lecturer	Attendance
1*	1999 Apr.– Sept. 1999 " "	Group A : Electrical and Electronics Technology Courses Group B : Administration, Management, and Productivity Courses Group C : General Courses	> 300	15,326
2	3-4 Nov.	Innovation for PLC Plating	1	21
3	2-3 Nov.	QC Workshop	1	14
4	24-25 Nov.	5S Improvement	1	21
5	27 Nov	Productivity Improvement	1	90
6	1-2 Dec.	ISO 9000 - 2000	1	11
7	17 Dec	Power Factor and Harmonic Problem	1	23
8	26 Jan. 2000	Productivity	1	32
9	28 Jan.	Efficiency Improvement for EE Industry Programme	1	31
10	7 Feb.	Competitive Strategy for EE Industry	1	130
11	7 feb.	EMC	1	67
12	26 Feb.	E-Commerce : Internet Business Strategies	1	20
13	10-11, 17-18, 25 Mar.	Java Script (Workshop)	1	7
14	16-18 Mar.	Network Installation and Problem Solving	1	6

* EEI had been executed the training program for 'Supplier Development Program'

No.	Date/Venue	Theme	Lecturer	Attendance
15	22 Mar.	PLC Control and Programming	1	8
16	23 Mar.	Loan for Industry Development (Seminar)	5	82
17	23-24 Mar.	Efficiency Improvement for EE Industry Programme (Seminar)	5	118
18	7-8 Apr.	Modern QCC Techniques	1	65
19	3-4 May	QCC Assessment	1	35
20	21 May	B to B and B to C E-Commerce Solution for SME	1	16
21	8-9 Jun.	Manufacturing Management : Heart of Supply Chain	2	16
22	14 Jun	EMC and Problem Solving in EE Industry	1	12
23	27 Jun.	Power Factor Improvement	1	36
24	8 Jul.	5S for Productivity	1	35
25	12 Jul.	Kaizen for Productivity	1	40
26	26 Jul.	PLC Control and Programming	1	28
27	23 Aug.	5S	1	40
28	23 Aug.	Efficiency Usage of Motor in EE Industry	1	26
29	29 Aug.	ISO 9000	1	36
30	19 Sep.	Power Factor Improvement	1	22
31	20 Sep.	PLC Control and Programming	1	34
32	28 Sep.	EMC and Problem Solving in EE Industry	1	23

ANNEX 6

RECORD OF COUNSELING SERVICE IN TISI AND EEI

1. TISI

Year	Name of Factory	Days	Contents of Counseling (*1)
1995 – 2000	N/A	N/A	N/A

2. EEI (Please see attachment 1)

Year	Name of Factory	Days	Contents of Counseling (*1)

(*1) Contents of Counseling	(1) 5S, (2) Total Productive management, (3) QC Story and Cause-and-Effect Diagram (4) QC Process Chart, (5) Total Quality Management in Factory (6) Other about QC techniques by request, (7) Others

Attachment 1

Year	Name of factories	Days	Contents of Counseling (*1)
1999-2000	1. Intronics Co., Ltd	60 Days	(7)
	2. T.A.T. (Thailand) Co., Ltd	60 Days	(6), (7)
	3. SCI Electric Manufacturer Co., Ltd	60 Days	(1), (6), (7)
	4. LT Works Co.,Ltd	60 Days	(6), (7)
	5. Firm Group Co.,Ltd	60 Days	(6), (7)
	6. Eminent Air (Thailand) Co.,Ltd	60 Days	(7)
	7. Success Industry Co.,Ltd	60 Days	(6), (7)
	8. Golden International Co.,Ltd	60 Days	(3), (6), (7)
	9. Kasem Plastic Industries Co., Ltd	60 Days	(7)
	10. Thai Trafo Co.,Ltd	60 Days	(3), (6), (7)
	11. Engineering Plastic Co.,Ltd	60 Days	(7)
	12. Polytron Industry Co.,Ltd	60 Days	(6), (7)
	13. Syndome Electronics Industry Co.,Ltd	60 Days	(7)
	14. Chulapat Plastic Co.,Ltd	60 Days	(3), (6), (7)
	15. Teamtronics Co., Ltd	60 Days	(7)
	16. Fujiki Industries Co., Ltd	60 Days	(7)
	17. Sahacharoenlohaplasticphan Co., Ltd	60 Days	(7)
	18. S.P.C. Electric Co.,Ltd	60 Days	(1), (3), (6), (7)
	19. Quality Transformer Co.,Ltd	60 Days	(7)
	20. C.Y.Tech Co., Ltd	60 Days	(7)
	21. Far Sight Sahakij Co., Ltd	60 Days	(7)
	22. S.P. Electric Industry Co., Ltd	60 Days	(7)
	23. Thai Lift Industries Public Co., Ltd	60 Days	(7)
	24. Siam Fluorescent lamp Co.,Ltd	60 Days	(1), (3), (6), (7)
	25. S.K.I Co., Ltd	60 Days	(7)
	26. T.C.S. Industry Group (1996) Co.,Ltd	60 Days	(7)

(*1) Contents of Counseling	(1) 5S (2) Total Productive Management (3) QC Story and Cause-and-Effect Diagram (4) QC Process Chart (5) Total Quality Management in factory (6) Other about QC techniques by request (7) Others

ANNEX 7

OTHER MAIN ACTIVITIES IN EEI

No	Content of Activities	Remarks
1	- Study and analyze the current situation of EE industry and propose the recommendations to the government	
2	- Co-organize the cooperative project with the organizations both domestically and internationally.	
3	- Facilitate the transaction process of importing raw materials and exporting final products	
4	- Develop the Testing Center to be able to certify the domestic and international standards of EE product.	
5	- Provide EE product testing	
6	- Collect and analyze the data of production, export and import value, and marketing concerned with the EE industry	
7	- Cooperate with other organization/institute to organize the seminar	
8	- Provide training courses both in-house and public training	

ANNEX 8

(Please see attachment 2)

PRESENT CONDITION OF MACHINERY AND EQUIOMENT PROVIDED BY JAPAN

NO	Name of Equipment	Specification	Maker	Date of Provision	Quantity	Installation place	Frequency of Operation(*1)	Frequency of Maintenance(*2)	Remarks

*0: Please refer to Annex 17 of Joint Evaluation Report signed in June 20, 1994.

(*1) A: Operate more than three (3) times in a week
B: Operate one (1) or two (2) times in a week
C: Operate a few times in a month
D: Hardly operate since the termination

(*2) A: Maintain regularly.
B: Maintain sometimes
C: Hardly maintain (operation now)
D: Need to repair (stopping now)

Attachment 2

LIST OF MAJOR EQUIPMENT AT THE ISTTC

I. ELECTRICAL AND ELECTRONIC TESTING

No.	Equipment name	Manufacturer	Model,Type	Qty.	Room
1	Watt meter	YEW	2041	10	212
2	Digital watt meter	YEW	2509	3	212
3	Watt-hour meter	HIOKI	3161	1	212
4	Watt meter	HIOKI	3184	2	212
5	Watt-hour meter and recorder	HIOKI	3181,3171	5,5	212
6	Digital power factor meter	YEW	2524	2	212
7	AC voltmeter	YEW	2013	10	212
8	AC voltmeter	YEW	2017	3	212
9	Electro-static voltmeter	YEW	2064	1	212
10	Electro-static voltmeter	YEW	2065	1	212
11	DC voltmeter	YEW	2011	10	212
12	DC volt-ammeter	YEW	2012	4	212
13	AC volt-ammeter	YEW	2014	4	212
14	AC ammeter	YEW	2013	25	212
15	DC ammeter	YEW	2011	20	212
16	Thermo-couple type ammeter	YEW	2016	8	212
					207
17	Digital AC meter	YEW	2533	2	212
18	Digital AC meter	HIOKI	3191	3	212
19	Digital multimeter	NATIONAL	VP-2710A	2	212
20	Digital multimeter	YEW	7542	2	212
21	Clamp multimeter	HIOKI	3104	2	212
22	Digital circuit tester	HIOKI	3231	10	212
23	Capacitance meter	ANDO	AG-4304	1	212
24	Wheatstone bridge	YEW	2768	1	105
				1	207
25	Double bridge	YEW	2752	2	108
26	Electronic galvanometer	YEW	2709	1	108
				1	207
27	Decade resistance box:Low Z	YEW	2793	4	108
				1	207
28	Decade resistance box:high Z	YEW	2793	4	108
29	Resistors for discharge test	TAIYO KEIKI		1	212

No.	Equipment name	Manufacturer	Model,Type	Qty.	Room
30	Rheostat	OGAWA SEIKI	OSK-10244	2	212
31	Switch resistance tester	NATIONAL	VP-2811A	2	212
32	Oscilloscope	NATIONAL	VP-5566A	3	211
33	Storage oscilloscope	IWATSU	MS-5311	1	211
34	Storage oscilloscope	IWATSU	MS-5311	1	211
35	Frequency meter	YEW	2038	4	212
36	Stop clock	SEIKO	S-111	5	211
37	Digital stroboscope	SUGAWARA	OSK-4795	2	211
38	Digital thermometer and	YEW	2572	2	211
	30 point selector	YEW	2815	2	211
39	Hybrid recorder	YEW	3081	2	211
40	Hybrid recorder	YEW	3087	6	211
41	Pocket thermometer	YEW	2542	5	211
42	Flat bed recorder	TOA DEMPA	FBR-253A	4	211
43	x-y recorder	GRAPHTECH	WX-1200	2	211
44	x-y recorder	GRAPHTECH	WX-2300-2Z	2	211
45	x-y recorder	GRAPHTECH	WX-2400-2Z	2	211
46	AC single phase voltage regulator	MATSUNAGA	TA-229	2	212
47	AC single phase voltage regulator	MATSUNAGA	TA-2245	3	207
48	AC single shase voltage regulator	MATSUNAGA	TA-229V	1	211
49	AC three phase voltage regulator	MATSUNAGA	TA3-10-380G	1	212
50	DC power supply source	TAKASAGO	GP035-50	4	212
51	DC power supply source	TAKASAGO	GP0250-10R	1	212
52	DC power supply source	TAKASAGO	GP0650-05R	1	113
53	DC power supply source	TAKASAGO	GP035-5	3	212
				2	128
54	DC power supply source	TAKASAGO	GP035-200R	1	212
56	Variable AC source	TAKASAGO	AA 2000F	1	212
57	Variable AC source	TAKASAGO	AA 5000	1	211
58	Variable power supply	MATSUNAGA	SVC-22136	1	113

No.	Equipment name	Manufacturer	Model,Type	Qty.	Room
59	High voltage testing device				108
	(1)Control board	OGAWA SEIKI	OSK6593	1	
	(2)Impluse gernerator	TTC	-	1	
	(3)Digital storage oscilloscope	TEKTRONIX	2221	1	
	(4)Oscilloscope camera	TEKTRONIX	C-5C	1	
60	High voltage power supply unit	OGAWA SEIKI	OSK11912	2	212
61	Step-up transformer	OGAWA SEIKI	OSK 10235	1	212
62	Step-down transformer	MATSUNAGA	WTC-4KB	2	212
63	Step-down transformer	MATSUNAGA	WTC-4KB	1	212
64	Insulation transformer	MATSUNAGA	WTC-1K	3	211
				3	212
				1	210
				1	208
			WTC-1K	1	207
			WTC-1K	1	202
65	Current transformer	TAKASAGO	-	2	212
66	Current transformer	YEW	2243-00	4	212
67	Current transformer	YEW	2241-00	4	212
68	Filament heating transformer	MATSUNAGA	WTC-30	2	212
69	Volt slider	MATSUNAGA	SD264.5-J	2	212
				3	211
70	Volt slider	MATSUNAGA	SD269-J	2	211
				2	212
71	Volt slider	MATSUNAGA	SD2627.3-J	2	212
72	Volt slider	MATSUNAGA	S3-402.6-G	1	212
73	Volt slider	MATSUNAGA	S3-405.2-G	1	212
74	Volt slider	MATSUNAGA	S3-4015.2-G	1	212
75	Megaohm tester	YEW	3213	1	212
				1	108
76	Insulation and breakdown tester	KIKUSUI	TOS8700	1	113
				1	108
77	Insulation and breakdown tester	KIKUSUI	TOS8650	1	212
				1	210
				1	209
78	Insulation resistance meter	ANDO	HR-4G	2	207

No.	Equipment name	Manufacturer	Model,Type	Qty.	Room
79	Insulation resistance meter	TOA DEMPA	SM-10E	2	211
80	High frequency breakdown tester	TOKYO SEIDEN	OSK 10231-Sp	1	212
81	Spark tester	YASUDA SEIKI	160 (YST-1)	1	108
82	tracking resistance tester	TOKYO SEIDEN	OSK10229-A-SP	1	208
83	Arc resistance tester	TOKYO SEIDEN	OSK10229-C-SP	1	208
84	Leakage current tester	SIMPSON	229-2	4	212
85	Earth continuity tester	KIKUSUI	TOS 6100	2	212
86	Safety test tool kit				212
	(1) Spring impact test hammer	EXCEL	CB-1	1	
	(2) Push pull gauge	EXCEL	CB-1	1	
	(3) Test finger	EXCEL	CB-1	1	
	(4) Test pin	EXCEL	CB-1	1	
	(5) Ball pressure	EXCEL	CB-1	1	
	(6) Sharp edge tester	EXCEL	CB-1	1	
	(7) Steel sphere	EXCEL	CB-1	1	
	(8) IS gauge	EXCEL	CB-1	1	
87	Safety test tool kit				212
	(1) Spring impact test hammer	EXCEL	CB-1	1	
	(2) Push pull gauge	EXCEL	CB-1	1	
	(3) Test finger	EXCEL	CB-1	1	
	(4) Test pin	EXCEL	CB-1	1	
	(5) Ball pressure	EXCEL	CB-1	1	
	(6) Sharp edge tester	EXCEL	CB-1	1	
	(7) Steel sphere)	EXCEL	CB-1	1	
	(8) IS gauge	EXCEL	CB-1	1	
88	Safety test tool kit				212
	(1) Spring impact test hammer	EXCEL	CB-1	1	
	(2) Push pull gauge	EXCEL	CB-1	1	
	(3) Test finger	EXCEL	CB-1	1	
	(4) Test pin	EXCEL	CB-1	1	
	(5) Ball pressure	EXCEL	CB-1	1	
	(6) Steel sphere	EXCEL	CB-1	1	
	(7) IS gauge	EXCEL	CB-1	1	

No.	Equipment name	Manufacturer	Model,Type	Qty.	Room
89	Standard Lamp caps and holdus for dimension testing				212
	(1) Gauge for the slots in lampholder B15	DAIICHI SOKUHAN	7006-13-14	1	
	(2) Gauge for the slots in lampholder B22	DAIICHI SOKUHAN	7006-13-14	1	
	(3) Plug gauge for E27 lampholder for testing contact making	DAIICHI SOKUHAN	7006-13-14	1	
	(4) Plug gauge for E27 lampholder for testing protection against contact	DAIICHI SOKUHAN	7006-13-14	1	
	(5) Plug gauge for E27 lampholder for testing contact making and protection against	DAIICHI SOKUHAN	7006-22-3	1	
	(6) Plug gauge for E40 lampholder for testing contact making	DAIICHI SOKUHAN	7006-23-2	1	
	(7) Plug gauge for E40 lampholder for testing contact making and protection against accidental contact	DAIICHI SOKUHAN	7006-24-2	1	
	(8) "GO" plug gauge for screw threads of lampholder E40	DAIICHI SOKUHAN	7006-25-4	1	
	(9) "GO" plug gauge for screw threads of lampholder E27	DAIICHI SOKUHAN	7006-25A-1	1	
	(10) "NOT GO" plug gauge for screw threads of lampholder E27	DAIICHI SOKUHAN	7006-26-2	1	
	(11) "NOT GO" plug gauge for screw threads of lampholder E40	DAIICHI SOKUHAN	7006-26-2	1	

No.	Equipment name	Manufacturer	Model,Type	Qty.	Room
	(12) "GO" gauge for dimension "S1" of E27 Cap on finished lamp	DAIICHI SOKUHAN	7006-27B-1	1	
	(13) "GO" Gauge for dimension "S1" of E27 Cap on finished lamp	DAIICHI SOKUHAN	7006-27C-1	1	
	(14) "NOT GO" Gauge for E27 cap on finished lamp	DAIICHI SOKUHAN	7006-28A-1	1	
	(15) "NOT GO" Gauge for E27 cap on finished lamp	DAIICHI SOKUHAN	7006-28-1	1	
	(16) "GO and "NOT GO" Gauge for BI-PIN cap G13 : NOT for use on finished lamp	DAIICHI SOKUHAN	7006-44-3	1	
	(17) "GO" Gauge for BI-PIN cap G13 on finished lamp	DAIICHI SOKUHAN	7006-45-3	1	
	(18) "GO" and "NOT GO" Gauge for BI-PIN cap G5 : NOT for use on finished lamp	DAIICHI SOKUHAN	7006-46-2	1	
	(19) "GO" Gauge for BI-PIN cap G5 on finished lamp	DAIICHI SOKUHAN	7006-46A-2	1	
	(20) Plug gauge for inflexible lampholder G5 for testing contact making	DAIICHI SOKUHAN	7006-47A-1	1	
	(21) Gauge for finished lamp fitted with E27 cap for testing contact making	DAIICHI SOKUHAN	7006-50-1	1	
	(22) Gauge for finished lamp fitted with E27 cap for testing protection against accidental contact	DAIICHI SOKUHAN	7006-51-1	1	
	(23) Gauge for finished lamp fitted with E27 cap for testing protection against accidental contac	DAIICHI SOKUHAN	7006-51A-1	1	

No.	Equipment name	Manufacturer	Model,Type	Qty.	Room
	(24) Gauge for finished lamp fitted with E40 cap for testing contact making	DAIICHI SOKUHAN	7006-52-1	1	
	(25) Gauge for finished lamp fitted with E40 cap for testing protection against accidental contace	DAIICHI SOKUHAN	7006-53-1	1	
	(26) Plug gauge for inflexible lampholder G13 for testing contact making	DAIICHI SOKUHAN	7006-60A-1	1	
90	Enamal wire testing	YASUDA SEIKI	553	1	212
91	Card flexing tester				113
	(1) Capture cord flexing tester	EVERTRON	-	1	
	(2) Load box	EVERTRON	-	1	
92	Cord bending fatique tester	TESTER SANGYO	BE-801-M	1	113
93	Triple parallel plate plastometer	TOYO SEIKI	534W-3	1	113
94	Tunble barrel	TAIYO KEIKI	-	1	113
95	Test table for heating test	TAIYO KEIKI	-	1	212
96	Hot mendrel heat resistance tester	EXCEL	T-01.05	1	208
97	V-belt electrical resistance measurment stand	TAIYO KEIKI	-	1	212
98	Flamability tester	EXCEL	BT-1500A	1	208
99	Muffle furnace	YAMATO KAGAKU	FP-21	1	208
100	Flux meter	YEW	3254	1	212
101	Lux meter	YEW	3281	1	212
102	Photometric integrating sphere				213
	(1) Integratating	TOSHIBA	A	1	
	(2) Measuring rack for incandescent lamp	TOSHIBA	A	1	
	(3) Measuring rack for fluorescent lamp	TOSHIBA	A	1	
	(4) Computer	TOSHIBA	J-3100GX	1	
	(5) Printer	TOSHIBA	PWS5267A	1	

No.	Equipment name	Manufacturer	Model,Type	Qty.	Room
	(6) Standard lamps of flus	TOSHIBA	A	33	
	100 V, 10 W	TOSHIBA	A	3	
	100 V, 20 W	TOSHIBA	A	3	
	100 V, 30 W	TOSHIBA	A	3	
	100 V, 40 W	TOSHIBA	A	3	
	100 V, 60 W	TOSHIBA	A	3	
	100 V,100 W	TOSHIBA	A	3	
	100 V,150 W	TOSHIBA	A	3	
	100 V,200 W	TOSHIBA	A	3	
	100 V,300 W	TOSHIBA	A	3	
	100 V,500 W	TOSHIBA	A	3	
	100 V,1000 W	TOSHIBA	A	3	
	(7) Standard fluorescent lamps	TOSHIBA	A	6	
	(8) Reference ballast 20 W	TOSHIBA	A	1	
	(9) Reference ballast 32 W	TOSHIBA	A	1	
	(10) Reference ballast 40 W	TOSHIBA	A	1	
103	Photometric bench				213
	(1) Bench 4 meters	TOSHIBA	-	1	
	(2) Lamp fixing stand	TOSHIBA	-	1	
	(3) Shad	TOSHIBA	-	5	
	(4) Photo receiver	TOSHIBA	-	1	
	(5) Standard lamps of intensity	TOSHIBA	B	18	
	8 V, 10 Cd	TOSHIBA	B	3	
	30 V, 40 Cd	TOSHIBA	B	3	
	100 V, 150 Cd	TOSHIBA	B	3	
	100 V, 370 Cd	TOSHIBA	B	3	
	100 V, 900 Cd	TOSHIBA	B	3	
	100 V, 3,000 Cd	TOSHIBA	B	3	
104	Digital photometer	TEKTRONIX	J16	1	213
105	Colorimetry				213
	(1) Colorimetry set	TOSHIBA	-	1	
	(2) Lamp lighting table	TOSHIBA	-	1	
	(3) Computer	TOSHIBA	J-3100GX	1	
	(4) Printer	TOSHIBA	PWS5267A	1	

No.	Equipment name	Manufacturer	Model,Type	Qty.	Room
	(5) Standard lamps of colout temp	TOSHIBA	B	1	
106	Lamp chamber tester	TAIYO KEIKI	-	1	212
107	Life test rack for incandescent lamp	TOSHIBA	-	1	113
108	Life test rack for fluorescent lamp	TOSHIBA	-	1	113
109	Testing circuits for fluorescent lamp	TOSHIBA	-	1	212
110	Testing circuits for incandescent lamp	TAIYO KEIKI	-	1	212
111	CAM/FM signal generator	NATIONAL	VP-8179B10	2	211
112	Stereo sognal generator	NATIONAL	VP-7635A	1	211
113	Audic signal generator	TOA DEMPA	CRS-121A	2	211
114	Furction generator	NATIONAL	VP-7420A	1	211
115	Electronic voltmeter	NF	M-174B	5	211
116	Frequency counter	KIKUSUI	FC01130	2	211
117	Audio analyzer	NATIONAL	VP-7722A	2	211
118	Wow flutter meter	KIKUSUI	677D	2	211
119	Oscilloscope	KIKUSUI	COM7200A	1	211
120	DC power supply	TAKASAGO	GP035-5	4	211
121	Field strength meter	ANRITSU	M-262F	1	211
122	Field strength meter	ANRITSU	MS-618	1	211
123	Shield room	Nippon shield	AIR-23-WS	1	211
124	Dummy antena	NATIONAL	VQ-085C	1	211
125	DC volt-ammeter	YEW	2012	1	207
126	AC volt-ammeter	YEW	2014	1	207
127	DC voltage/current standard	YEW	2554	1	207
128	AC voltage/current standard	YEW	2558	1	207
129	Temperature oven	TAKAUGI	-	1	212
130	Anemometer	OGAWA SEIKI	DA-1	2	113
131	Heating effiviency test atand	TAIYO KEIKI		1	212
132	Mechanical endurances test for speed regulator:rotary type	TAIYO KEIKI	-	1	212

No.	Equipment name	Manufacturer	Model,Type	Qty.	Room
133	Mechanical endurances test for speed regulator:push type	TAIYO KEIKI	-	1	212
134	Microphone 1 inch	B + K	4145	2	217
135	Microphone 1 inch	B + K	4133	2	217
136	Pre-amplifier	B + K	26395	2	217
137	Measuring amplifier	B + K	2636	1	217
138	Sine wave generator	B + K	1051	1	217
139	Level recorder	B + K	2307	1	217
140	Band pass filter	B + K	1617	1	217
141	Power amplifier	B + K	2706	1	217
142	Sound level meter	RION	NA-29E	2	217
			CP-10	1	
			NC-11	1	
			NA-20	2	
143	Level recorder	RION	LR-04	2	217
144	Pistone phone	RION	NC-72	1	217
145	Anechoic room	-	-	1	217
	(1) Speaker	TANNOY	LYNX	3	
	(2) Speaker	TANNOY	-	1	
146	Calorimeter room			1	219
	(1) Calorimeter control panel	OHNISHI	-	1	
	(2) Control panel	OHNISHI	-	1	
	(3) Room side	OHNISHI	-	1	
	(4) Outdoor side	OHNISHI	-	1	
	(5) Computer	HEWLETT PACKARD	9122C	1	
	(6) Monitor	HEWLETT PACKARD	35731B	1	
	(7) Printer	HEWLETT PACKARD	41031A	1	
	(8) UPS	YAMABISHI	1000HF	1	
	(9) Cyclometric box	CHINO	-	2	
	(10) Pressure equilizer	AENIX	WH-0535	2	
	(11) Scanner for thermocouple	YOKOGAWA	388262	1	
	(12) Electronic balance	AND	-	2	
	(13) Water pump	HITACHI	W-p80F	2	
	(14) Chiller unit	HITACHI	RCU5Y	2	
	(15) Distiller	-	-	1	

No.	Equipment name	Manufacturer	Model,Type	Qty.	Room
	(16) Water pump	HITACHI	WT-K200F	1	
	(17) Air compressure	HITACHI	WT-K200F	1	
	(18) Cooling towm	SHINWA SANGYO	MXC-P50AS	1	
	(19) Refrigerator	SHINWA SANGYO	MXC-P50AS	5	

Supplementary Equipment ปีงบประมาณ 2535

1. IEC Impact hammer	2 sets
2. Testing Circuit of Starter	1 set
3. Gauges of Starter	1 set

Supplementary Equipment ปีงบประมาณ 2536

1. Standard Air Conditioners	6 sets
2. Impact Tester	1 set
3. Go/Contact Gauge	1 set
4. Grip for Torque Test of Incandescent Lamps	1 set
5. Glow-wire Test Apparatus	1 set
6. Fault Condition Test Apparatus	1 set

Supplementary Equipment ปีงบประมาณ 2537

1. Quartz Thermometer	1 set
2. Quartz Probe	1 set
3. Anemometr	1 set
4. Digital Manometer	1 set
5. Water Bath	1 set
6. Ventilated Psychrometer	1 set

ANNEX 9

NECESSITY OF REPAIR, SPARE PARTS AND CONSUMABLES OF MACHINERY AND EQUIPMENT PROVIDED BY JAPAN 1/2

Priority (*1)	Name	Necessity of repair(*2) and the detail	Necessity of spare parts and consumables (*2) and the detail	Availability of spare parts and onsumables In Thailand (*3) and the quotations	REMARKS(*4)
1	Photometric integrating sphere (Testing equipment in dark room - TOSHIBA)	A Up-grading control system Moving and reinstalling to new laboratory	A Standard lamps Reference ballast	B	
2	Colorimetry (Testing equipment in dark room - TOSHIBA)	A Repairing of measuring sensor Up-grading control system Moving and reinstalling to new laboratory	A Measuring sensor	B	
3	Photometric bench (Testing equipment in dark room - TOSHIBA)	A Moving and reinstalling to new laboratory	A Standard lamps of intensity	B	
4	Walk-in temperature and humidity chamber	B Moving and reinstalling to new laboratory	B	B	

(*1) Please clarify the priority among the items by putting numbers (No.1 as the highest priority)

(*2) A: Must B: Necessary C: If possible	(*3) A: Available B: Not available	(*4) Any relation with supplementary technical cooperation (Annex 11, Annex 12)

ANNEX 9

NECESSITY OF REPAIR, SPARE PARTS AND CONSUMABLES OF MACHINERY AND EQUIPMENT PROVIDED BY JAPAN 1/2

Priority (*1)	Name	Necessity of repair(*2) and the detail	Necessity of spare parts and consumables (*2) and the detail	Availability of spare parts and onsumables In Thalland (*3) and the quotations	REMARKS(*4)
5	Calorimeter (Testing equipment for room air-conditioner - OHNISHI)	B Up-grading control system Reinstalling thermocouple	B Flow meter Humidifier Measuring sensor	B	

(*1) Please clarify the priority among the items by putting numbers (No.1 as the highest priority)

(*2) A: Must B: Necessary C: If possible	(*3) A: Available B: Not available	(*4) Any relation with supplementary technical cooperation (Annex 11, Annex 12)

ANNEX 10

COOPERATION FOR MACHINERY AND EQUIPMENT ALREADY PROVIDED BY THE GOVERNMENT OF JAPAN (JAPANESE EXPERT)

Priority(*1)	Number of machinery and equipment(*2)	Details of Expert's role (repair or/and maintenance)	Period of Dispatch of Japanese Expert			Remarks
			From	To	Period (months)	
1	1, 2, and 3	Remove and reinstall the equipment in Dark Room (photometric integrating sphere, colorimetry and photometric bench) to new laboratory Repair the equipment Up-grade control system Provide training on the test system Provide maintenance techniques	April 2001	May 2001	1	
2	4	Remove and reinstall walk-in temperature and humidity chamber to new laboratory	April 2001	May 2001	1	

(*1) Please clarify the priority among the items by putting numbers (no.1 as the highest priority)

(*2) Please correspond to the machinery and equipment number of ANNEX 9

ANNEX 11 THEME No. 1

THEMES WHICH NEED SUPPLEMENTARY TECHNICAL COOPERATION BY THE JAPANESE SHORT-TERM EXPERTS

1. Field of the Japanese expert (Theme field) : Lighting and luminaires testing .

2. Period of Training : From April 2001 to June 2001 (3 months)

3. Detailed Subjects of Guidance by Experts:

   3.1 Testing according to IEC 60598 (Luminaires)

   3.2 Testing according to IEC 60928 (A.C. supplied electronic ballasts for tubular fluorescent lamps)

   3.3 Providing advice on test results and problems analysis

4. Counterpart:

   4.1 Mr. Teera Rimpirangsi

   4.2 Mr. Chairat Tuamprasert

   4.3 Mr. Danai Sattabut

   4.4 Mr. Sarawoot Singto

5. Qualification required to the Expert:

   5.1 Education : Bachelor degree in electrical engineering

   5.2 Experience : at least 10 years experience on above field

   5.3 Language : good command in English

ANNEX 11 THEME No. 2

THEMES WHICH NEED SUPPLEMENTARY TECHNICAL COOPERATION BY THE JAPANESE SHORT-TERM EXPERTS

1. Field of the Japanese expert (Theme field) : Safety test for household electrical appliance

2. Period of Training : From June 2001 to August 2001 (3 months)

3. Detailed Subjects of Guidance by Experts:

   3.1 Testing according to IEC 60335-1

   3.2 Testing according to IEC 60335-2-x

   3.3 Providing advice on test results and problems analysis

4. Counterpart:

   4.1 Mr. Witee Srimongkol

   4.2 Mr. Narin Phansantieh

   4.3 Mr. Theerawat Wiwekwin

   4.4 Mr. Pijit Homsombat

5. Qualification required to the Expert:

   5.1 Education : Bachelor degree in electrical engineering

   5.2 Experience : at least 10 years experience on above field

   5.3 Language : good command in English

ANNEX 11 THEME No. 3

THEMES WHICH NEED SUPPLEMENTARY TECHNICAL COOPERATION BY THE JAPANESE SHORT-TERM EXPERTS

1. Field of the Japanese expert (Theme field) : Safety test for electronics and IT appliance .

2. Period of Training : From October 2001 to December 2001 (3 months)

3. Detailed Subjects of Guidance by Experts:

   3.1 Testing according to IEC 60065

   3.2 Testing according to IEC 60950

   3.3 Providing advice on test results and problems analysis

4. Counterpart:

   4.1 Ms. Vimolpun Ruangsri

   4.2 Mr. Channarong Pattamasing

   4.3 Mr. Pakorn Poompan

5. Qualification required to the Expert:

   5.1 Education : Bachelor degree in electrical engineering

   5.2 Experience : at least 10 years experience on above field

   5.3 Language : good command in English

ANNEX 11 THEME No. 4

THEMES WHICH NEED SUPPLEMENTARY TECHNICAL COOPERATION BY THE JAPANESE SHORT-TERM EXPERTS

1. Field of the Japanese expert (Theme field) : EMC testing

2. Period of Training : From May 2001 to July 2001 (3 months)

3. Detailed Subjects of Guidance by Experts:

   3.1 Testing according to CISPR 13

   3.2 Testing according to IEC 61000-4-x

   3.3 Providing advice on test results and problems analysis

4. Counterpart:

   4.1 Mr. Narat Rujirat

   4.2 Ms. Pompimon Ratanawichien

   4.3 Mr. Thossaphom Udomsinsirikul

   4.4 Mr. Pudit Palakawong

5. Qualification required to the Expert:

   5.1 Education : Bachelor degree in electrical engineering

   5.2 Experience : at least 10 years experience on the above field

   5.3 Language : good command in English

ANNEX 12

LIST OF THE MACHINERY AND EQUIPMENT NEEDED TO BE PROVIDED ON THE THEME No. 2 .

1. Name of machinery and equipment : Thermostat and temperature limiters test apparatus .
   (Number of Priority : 1)

2. Quantity

   1

3. Specification

   According to IEC 60335-1 and IEC 60730

4. Maker (Price unit JP ¥ 1,000)

   - (approximately JP ¥ 3,000,000)

5. Reasons of necessity

   To be able to do complete safety test for household electrical product according to IEC 60335

6. Availability in Thailand and the quotation

ANNEX 12

LIST OF THE MACHINERY AND EQUIPMENT NEEDED TO BE PROVIDED ON THE THEME

No. 2 .

1. Name of machinery and equipment : Automatic controller test apparatus .

   (Number of Priority : 2)

2. Quantity

   1

3. Specification

   According to IEC 60335-1 and IEC 60730

4. Maker (Price unit JP ¥ 1,000)

   - (approximately JP ¥ 3,000,000)

5. Reasons of necessity

   To be able to do complete safety test for household electrical product according to IEC 60335

6. Availability in Thailand and the quotation

ANNEX 12

LIST OF THE MACHINERY AND EQUIPMENT NEEDED TO BE PROVIDED ON THE THEME

No. 2 .

1. Name of machinery and equipment : Switch test apparatus .

   (Number of Priority : 3)

2. Quantity

   1

3. Specification

   According to IEC 60335-1 and IEC 60328

4. Maker (Price unit JP ¥ 1,000)

   - (approximately JP ¥ 3,000,000)

5. Reasons of necessity

   To be able to do complete safety test for household electrical product according to IEC 60335

6. Availability in Thailand and the quotation

ANNEX 12 4/5

LIST OF THE MACHINERY AND EQUIPMENT NEEDED TO BE PROVIDED ON THE THEME

No. 3 .

1. Name of machinery and equipment : Vibration tester .

   (Number of Priority : 4)

2. Quantity

   1

3. Specification

   According to IEC 60065

4. Maker (Price unit JP ¥ 1,000)

   - (approximately JP ¥ 9,000,000)

5. Reasons of necessity

   To be able to do complete safety test for electronics product according to IEC 60065

6. Availability in Thailand and the quotation

ANNEX 12 5/5

LIST OF THE MACHINERY AND EQUIPMENT NEEDED TO BE PROVIDED ON THE THEME

No. 3 .

1. Name of machinery and equipment : Laser test apparatus .

   (Number of Priority : 5)

2. Quantity

   1

3. Specification

   According to IEC 60065

4. Maker (Price unit JP ¥ 1,000)

   (approximately JP ¥ 1,500,000)

5. Reasons of necessity

   To be able to do complete safety test for electronics product according to IEC 60065

6. Availability in Thailand and the quotation

ANNEX 13

LIST OF THAI COUNTERPART PERSONNEL FOR THE AFTERCARE PROGRAMME

NO.	NAME	AGE	SEX	PRESENT POSITION	QUALIFICATION	REMARKS
1	Mr. Kovit Masarat		M	Director	Ph.D. (E.E.)	
2	Mr. Narat Rujirat		M	Technical manager	M.Eng. (E.E.)	
3	Mr. Witee Srimongkol		M	Senior engineer	M.Eng. (E.E.)	
4	Ms. Pornpimon Ratanawichien		F	Senior engineer	M.Eng. (E.E.)	
5	Mr. Teera Rimpirangsi		M	Engineer	B.Eng. (E.E.)	
6	Ms. Vimolpun Ruangsri		F	Engineer	B.Eng. (E.E.)	
7	Mr. Thossaphorn Udomsinsirikul		M	Engineer	B.Eng. (E.E.)	
8	Mr. Narin Phansantieh		M	Technician	Dipl. (E.E.)	Qualified
9	Mr. Theerawat Wiwekwin		M	Technician	Dipl. (E.E.)	Qualified
10	Mr. Chairat Tuamprasert		M	Technician	Dipl. (E.E.)	Qualified
11	Mr. Danai Sattabut		M	Technician	Dipl. (E.E.)	Qualified
12	Mr. Pijit Homsombat		M	Technician	Dipl. (E.E.)	Qualified
13	Mr. Pakorn Poompan		M	Technician	Dipl. (E.E.)	Qualified
14	Mr. Channarong Pattamasing		M	Technician	Dipl. (E.E.)	Qualified
15	Mr. Sarawoot Singto		M	Technician	Dipl. (E.E.)	Qualified
16	Mr. Pudit Palakawong		M	Technician	Dipl. (E.E.)	Qualified