タイ王国
金属加工機械工業開発研究所
プロジェクト概要

The Japanese Technical Cooperation Project
on the Metalworking and Machinery Industries Development Institute

------ MIDI PROJECT ------

昭和６３年１１月

国際協力事業団

1、要請背景

タイ国政府は、経済自立促進、経済基盤強化のため、1981年10月から始まった第5次国家経済社会開発5カ年計画及び1986年10月から始まった第6次5カ年計画においても、国の工業化を支える中小工業の育成に力を注いでいる。

その一環として、タイ国政府は、

1）金属加工技術の教育訓練、
2）中小企業工場への助言及び、指導、
3）適正な生産技術の開発と試作及び、受託試験検査、
4）技術情報の普及

等を目的とする『金属加工機械工業開発研究所』の設立に関する無償資金協力と、その研究所に対する技術協力を日本政府に要請してきた。

2、経緯

金属加工業振興計画調査	昭和59年5月14日～昭和59年6月13日
無償基本設計調査団派遣	昭和60年1月14日～昭和60年2月　2日
無償基本設計ドラフト説明	昭和60年7月　3日～昭和60年7月　9日
技協事前調査団派遣	昭和60年6月　9日～昭和60年6月18日
技協長期調査員派遣	昭和61年2月16日～昭和61年3月　8日
技協実施協議調査団派遣	昭和61年7月22日～昭和61年7月30日

3、無償資金協力内容　　資金供与額：約29．15億円

1）機材概要

a）鋳造設備
b）熱処理設備
c）鍛造設備
d）材料試験・検査設備
e）溶接設備
f）機械加工設備
g）精密測定設備
h）金型テスト溶接設備
i）工場共通設備
j）簡易自動化設備
k）視聴覚設備

2）施設概要

a）Main Building	1棟
b）Workshop	2棟
c）Utility Building	4棟
d）Dormitory	1棟
e）Canteen	1棟

建設期間：PHASE I　昭和61年5月～昭和62年2月　引渡し式(2/5)
　　PHASE II　昭和62年2月～昭和63年3月　引渡し式(3/14)

4、技術協力内容

1）プロジェクト名称

The Japanese Technical Cooperation Project
on the Metalworking and Machinery Industries Development Institute

2）協力期間

開始：１９８６年１０月１日
終了：１９９１年９月３０日

3）協力目的

当研究所の職員が、
①トレーニングコース・セミナーの開催、民間企業に対する巡回指導・コンサルティングサービス
②民間企業に対する試験・検査及び試作受託等の活動
を実施するに当たり、技術指導やアドバイスを行ない自立出来るようにすることを目的としている。

4）技術協力分野

主たる協力分野
①鋳造
②熱処理
③材料試験、検査
④機械加工
⑤精密測定検査
⑥機械設計

補足的協力分野
①教育訓練システム
②教材作成と情報管理
③溶接、板金
④電気メッキ
⑤管理技術
⑥鍛造

５）専門家派遣

長期専門家９名，短期専門家約２０名

＊専門家リスト（昭和６３年１１月現在）

	氏　名	担当分野	L(長期)/S(短期)	派遣期間	備考
1.	黒岩　忠春	リーダー	L	28/JAN/1987～ 27/JAN/1989	
2.	永江　勉	業務調整	L	10/DEC/1986～ 09/DEC/1988	
3.	大塚　敏男	機械加工技術	L	17/APR/1987～ 16/APR/1989	
4.	小林　菊男	機械設計一般	S	19/MAY/1987～ 18/FEB/1988	帰国済
5.	早川　雅彦	金属組織	S	05/JUN/1987～ 04/FEB/1988	帰国済
6.	神山　達	材料試験・検査	S	05/JUN/1987～ 04/MAR/1988	帰国済
7.	大山　光男	熱処理技術	L	03/JUL/1987～ 02/JUL/1989	
8.	中山　正義	鋳造技術	L	03/JUL/1987～ 02/JUL/1989	
9.	鈴木　道雄	簡易自動制御	S	18/SEP/1987～ 17/JAN/1988	帰国済
10.	小島　芳種	機械加工技術	L	13/NOV/1987～ 12/NOV/1989	
11.	福島　謙	ﾒｯｷ 施設据付	S	05/JAN/1988～ 18/MAR/1988	帰国済
12.	末松　岩生	熱処理技能	S	12/FEB/1988～ 31/JAN/1989	
13.	杉山　茂嘉	溶接・板金技術	S	12/FEB/1988～ 31/JAN/1989	
14.	桜井　国夫	工作機械設計	L	08/APR/1988～ 07/APR/1990	
15.	野村　利雄	鋳造技術	L	08/JUL/1988～ 07/JUL/1990	
16.	荒井　考志	視聴覚教材作成	S	08/JUL/1988～ 07/SEP/1990	帰国済
17.	上野　滋	精密計測・測定	S	31/AUG/1988～ 01/OCT/1988	帰国済
18.	澁谷　輝雄	非破壊検査	S	07/OCT/1988～ 21/MAR/1989	
19.	楠原　建	鋳造木型製作	S	07/OCT/1988～ 21/MAR/1989	
20.	本庄　晴夫	品質管理	S	07/OCT/1988～ 21/MAR/1989	
21.	鈴木　城	金型設計	L	02/DEC/1988～ 01/MAR/1990	

６）研修員受入れ

＊研修員リスト（約２０名受入れ予定）

	氏名	研修分野	研修期間
1.	Mr.Virat	企画	08/NOV/1986～ 23/NOV/1986
2.	Mr.Vorapon	機械設計	21/NOV/1986～ 19/MAY/1987
3.	Mr.Kitipat	金属組織	21/NOV/1986～ 19/AUG/1987
4.	Mr.Sangchai	NC-Machining	13/JAN/1987～ 23/OCT/1987
5.	Mr.Somdech	教育機材作成	03/MAR/1987～ 14/JUL/1987
6.	Mr.Tanete	教育訓練ｼｽﾃﾑ	19/MAY/1987～ 18/JUL/1987
7.	Mr.Paiboon T	歯車加工・計測	14/JUL/1987～ 22/DEC/1987
8.	Mr.Wiwachai	非破壊検査	17/SEP/1987～ 28/JUN/1988
9.	Mr.Pongsak	農業機械設計	27/OCT/1987～ 26/APR/1988
10.	Ms.Sunimon	工業経営	22/MAR/1988～ 13/JUN/1988
11.	Mr.Sunthorn	鋳造技術	15/NOV/1988 01/AUG/1989
12.	Mr.Prakob	鍛造技術	15/NOV/1988 09/MAY/1989
13.	Mr.Somkiat	電気ﾒｯｷ 技術	15/NOV/1988 13/APR/1989
14.	Mr.Thanete	ﾎﾟﾝﾌﾟ･ﾊﾞﾙﾌﾞ 設計	15/NOV/1988 18/MAR/1989

７）供与機材

①協議に基づき必要と思われる機材、材料

②機材、設備の備品等

ORGANIZATION CHART OF MIDI

METALWOKING AND MACHINERY INDUSTRY DEVELOPMENT INSTITUTE (82)

DIRECTOR Dr. Damri

ADMINISTRATION SECTION (15)

Ms. Orn (AO)

CORRESPONDENT UNIT

Ms. Pornpimol (Typist)
Ms. Nantawan
Ms. Buakome
Ms. Chantima
Ms. Chatong
Mr. Anuwat
Mr. Vichai
Mr. Sompong
Mr. Srisith
Mr. Jirawat
Mr. Tavee
Mr. Samphan
Mr. Chamlong

PROCUREMENT UNIT

ACCOUNTING & FINANCE

Mr. Vasit

TRAINING SERVICE SECTION (8)

Mr. Sombat (IT)
Mr. Somdej (ITO)
Ms. Supa (ITO)
Mr. Chalermchai
Mr. Suthep
Mr. Taklaew (IIO)
Mr. Chamlong
Ms. Puttachart

RESEARCH AND DEVELOPMENT GROUP (17)

Mr. Sivasakdi (E)

EDUCATIONAL DEVELOPMENT SECT (2)

Dr. Pasu (E)
Mr. Paiboon Cha (TTO)

TECHNO-ECONOMIC STUDY SECT. (4)

Mr. Tanech (E)
Mr. Paisit (E)
Ms. Sunimon (ITO)
Mr. Tirapong

ENGINERRING DESIGN SECT. (7)

Mr. Jakaporn (E)
Mr. Preecha (ITO)
Mr. Vorapong (E)
Mr. Pongsak (E)
Mr. Charoen (E)
Mr. Somchai (E)
Mr. Amornwat (IT)

LOW COST AUTOMATION SECT. (3)

Mr. Narong (IT)
Mr. Umnuay (E)
Mr. Utain (IT)

WORKSHOP SUB-DIVISION (34)

Mr. Virat (E)

FOUNDRY/PATTERN MAKING SEC (7)

Mr. Sunthon (ITO)
Mr. Wannachai (ITO)
Mr. Wacharin
Mr. Sumruay
Mr. Somkiat
Mr. Nopadon (IT)
Mr. Wasan (IT)

WELDING/SHEET METAL SECT. (4)

Mr. Kaney (ITO)
Mr. Boongsong (IT)
Mr. Monthon (ITO)
Mr. Vicha

HEAT TREATMENT SECT. (4)

Mr. Wisuth (ITO)
Mr. Prakob (E)
Mr. Prawut (IT-1)
Mr. Apichart

MACHINING SECT. (13)

Mr. Paiboon T. (ITO)
Mr. Sompong (ITO)
Mr. Pirom
Mr. Pornchai
Mr. Ronnachai
Mr. Sahas (ITO)
Mr. Saengchai (ITO)
Mr. Sittichai (IT-2)
Mr. Veera (IT-2)
Mr. Paisarn (IT-2)
Mr. Dumrong (IT-2)
Mr. Sattan (IT-2)
Mr. Bunthow (IT-1)

ELECTRO PLATING SECT. (5)

Mr. Anun (ITO)
Mr. Boonrod
Mr. Parinya
Mr. Virat
Mr. Somkiat (E)

MAINTENACE SECT. (0)

TEST & INSPECTION SECTION (7)

Mr. Paiboon Chu (E)
Mr. Kittipat (E)
Mr. Rapee (ITO)
Mr. Wachara (E)
Mr. Wiwecahai (E)
Mr. Bandit (E)
Mr. Virasak (E)

E = Engineer
IT = Industrial Technologist
ITO = Industrial Technical Officer
TTO = Technical Training Officer
AO = Administration Officer
AVO = Audio-Visual Officer
IIO = Industrial Implementation Officer
IT-2 = Industrial Technician-2
IT-1 = Industrial Technician-1
( ) = Number of Staff

AS OF NOVEMBER, 1988

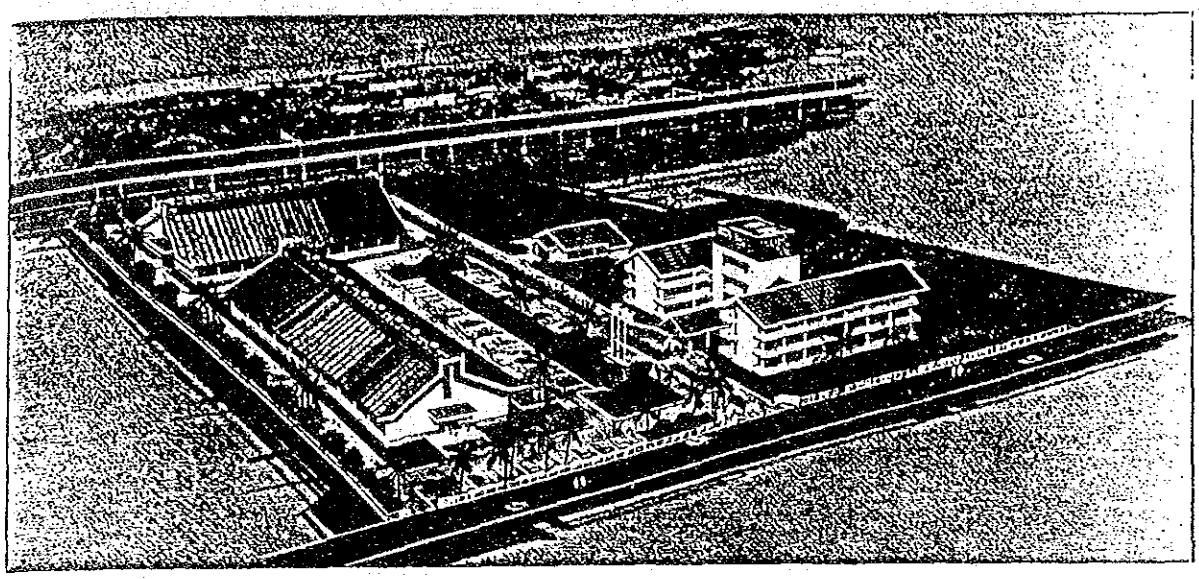
6、ＭＩＤＩ施設概要

1）所在地　Soi Tree Mit, Kluay Nam Thai,Rama 4 Road
Bangkok 10110,
☎　381-1812 (Direct)
☎　381-1051～6, ext 210,207

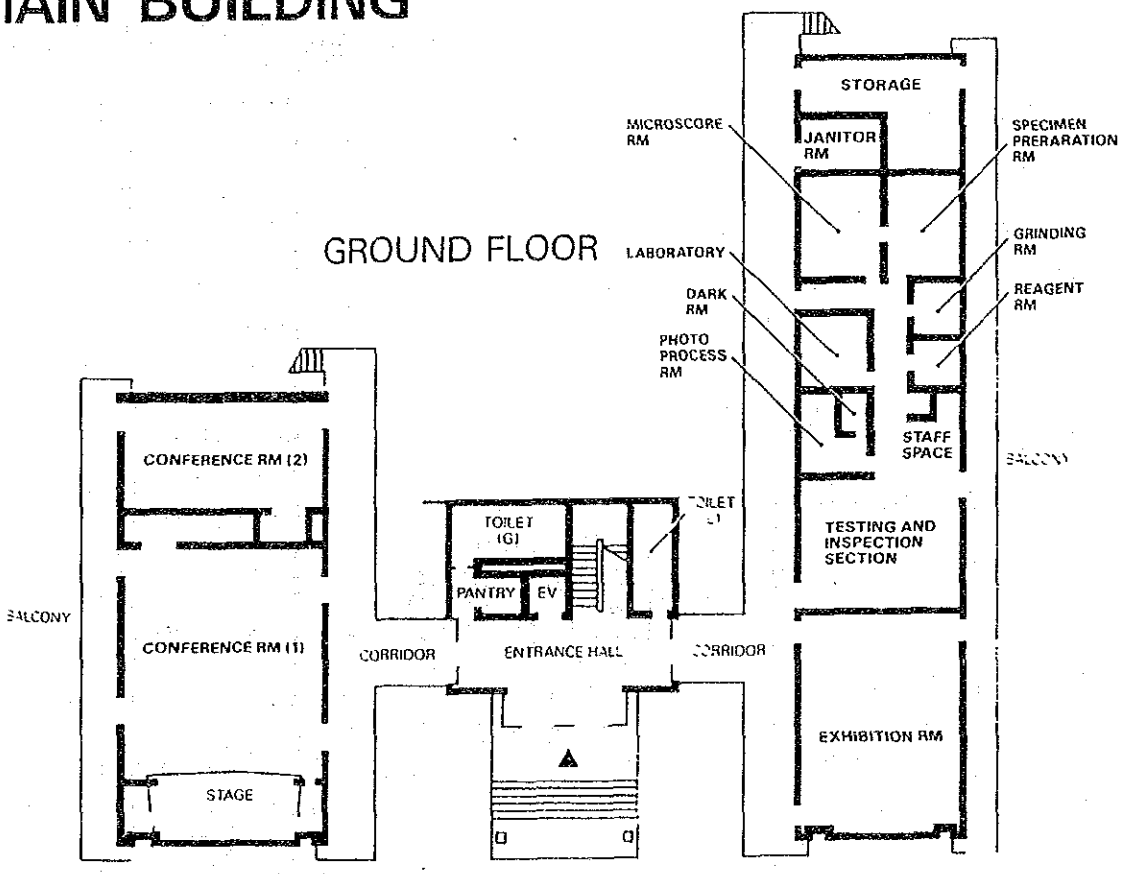
2）敷地面積　8,321.38 m²
Main Building ; 3,057.08 m²
Workshops　; 4,105.86 m²
Utility Buildings ; 83.0 m²
Dormitory　; 847.13 m²
Canteen　; 223.31 m²

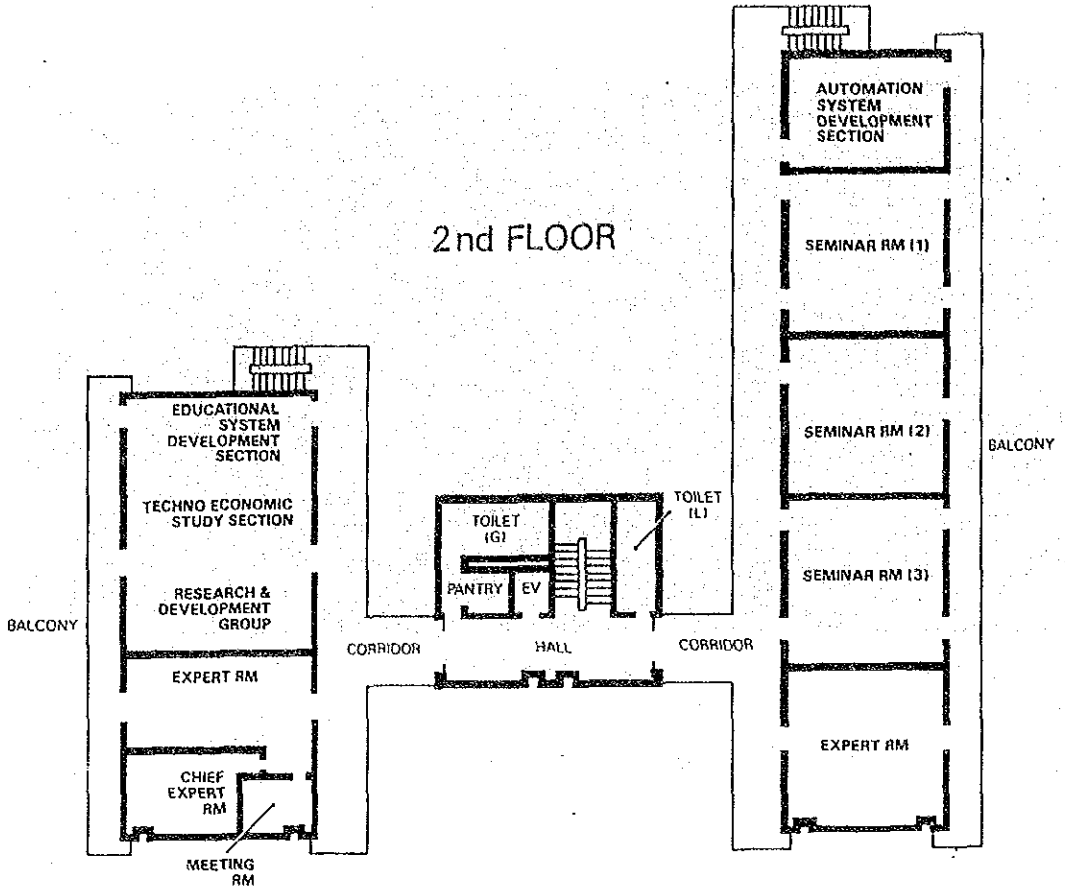
3）施設（第一期）　本館Ａ；
会議室　1，講堂　1，職員室　1，ＪＩＣＡ専門家室　1
セミナー室　1，ＡＶ室　1，製図室　1，
本館Ｂ；
展示室　1，材料試験検査室　1，セミナー室　3，
ＪＩＣＡ専門家室　1，実験室　1，所長室　1，
事務室　1，印刷室　1，会議室　1，図書室　1，
その他
食堂　1

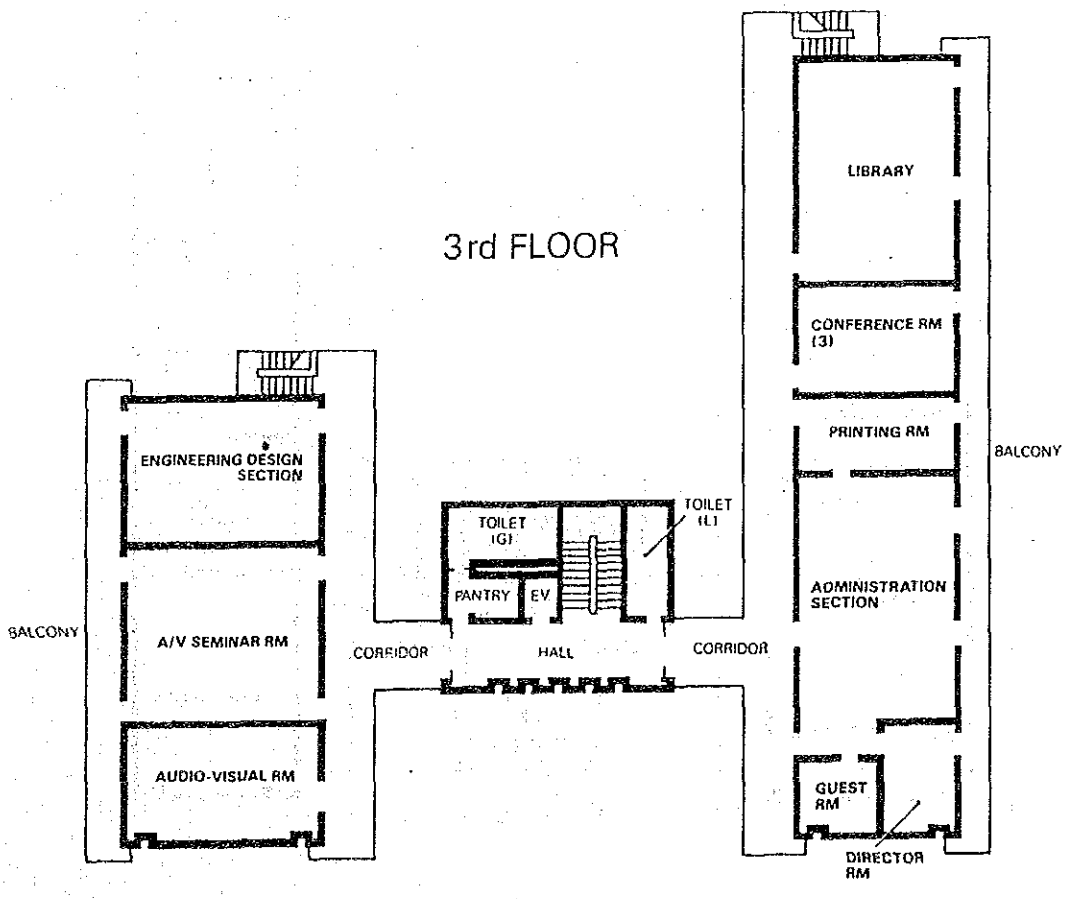
（第二期）　工場Ａ；
機械加工、溶接、メッキ、精密機械加工、精密測定施設等、
職員室　1、会議室　1、研修員室　1、浴室　1
工場Ｂ；
鍛造、鋳造、熱処理、鋳型、施設等
職員室　1、倉庫　1、浴室　1
研修員宿舎；
宿泊室　２１室、事務室　1、会議室　1、
入口ホール　1、洗濯室　1



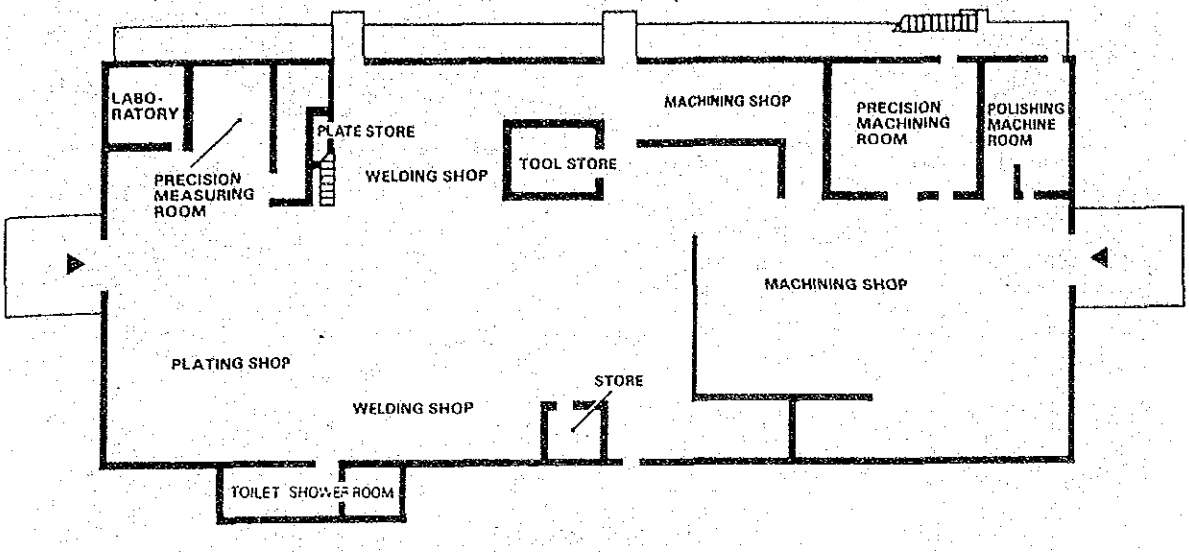
MAIN BUILDING



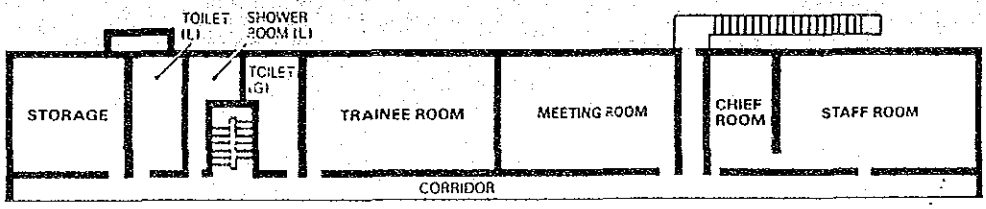

2nd FLOOR
AUTOMATION SYSTEM DEVELOPMENT SECTION
SEMINAR RM (1)
SEMINAR RM (2)
SEMINAR RM (3)
EXPERT RM
BALCONY
EDUCATIONAL SYSTEM DEVELOPMENT SECTION
TECHNO ECONOMIC STUDY SECTION
RESEARCH & DEVELOPMENT GROUP
EXPERT RM
CHIEF EXPERT RM
MEETING RM
BALCONY
TOILET (G)
TOILET (L)
PANTRY
EV
CORRIDOR
HALL
CORRIDOR


3rd FLOOR
LIBRARY
CONFERENCE RM (3)
PRINTING RM
ADMINISTRATION SECTION
GUEST RM
DIRECTOR RM
BALCONY
ENGINEERING DESIGN SECTION
A/V SEMINAR RM
AUDIO-VISUAL RM
BALCONY
TOILET (G)
TOILET (L)
PANTRY
EV
CORRIDOR
HALL
CORRIDOR

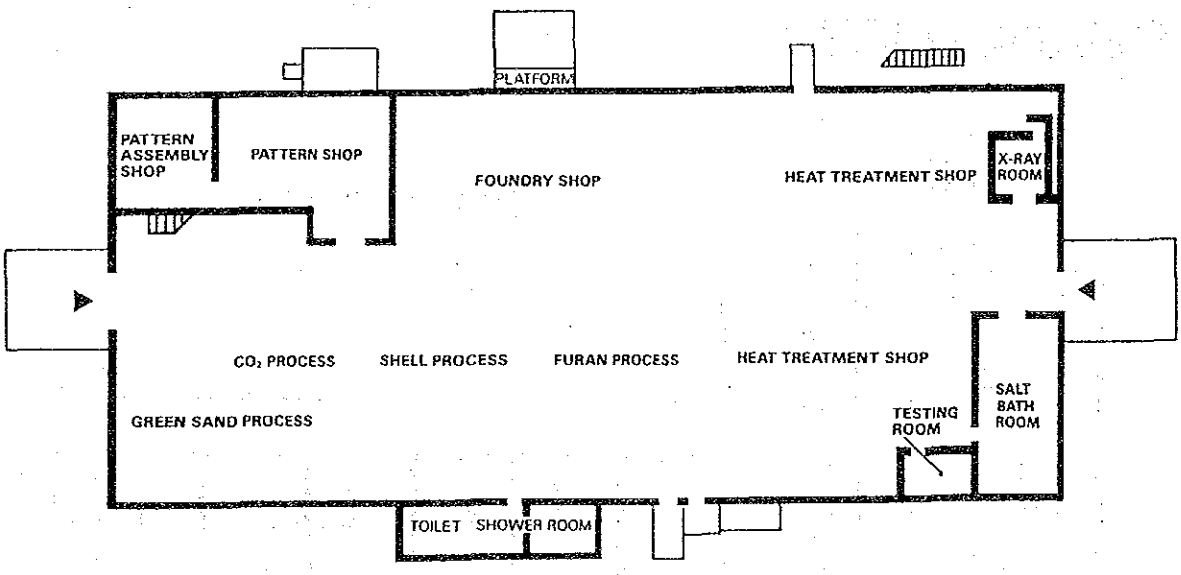
WORKSHOP (A) GROUND FLOOR



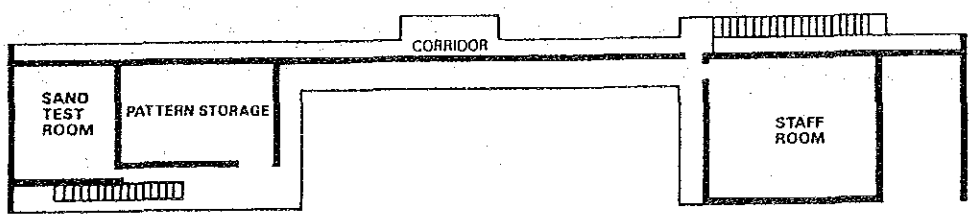
MEZZANINE

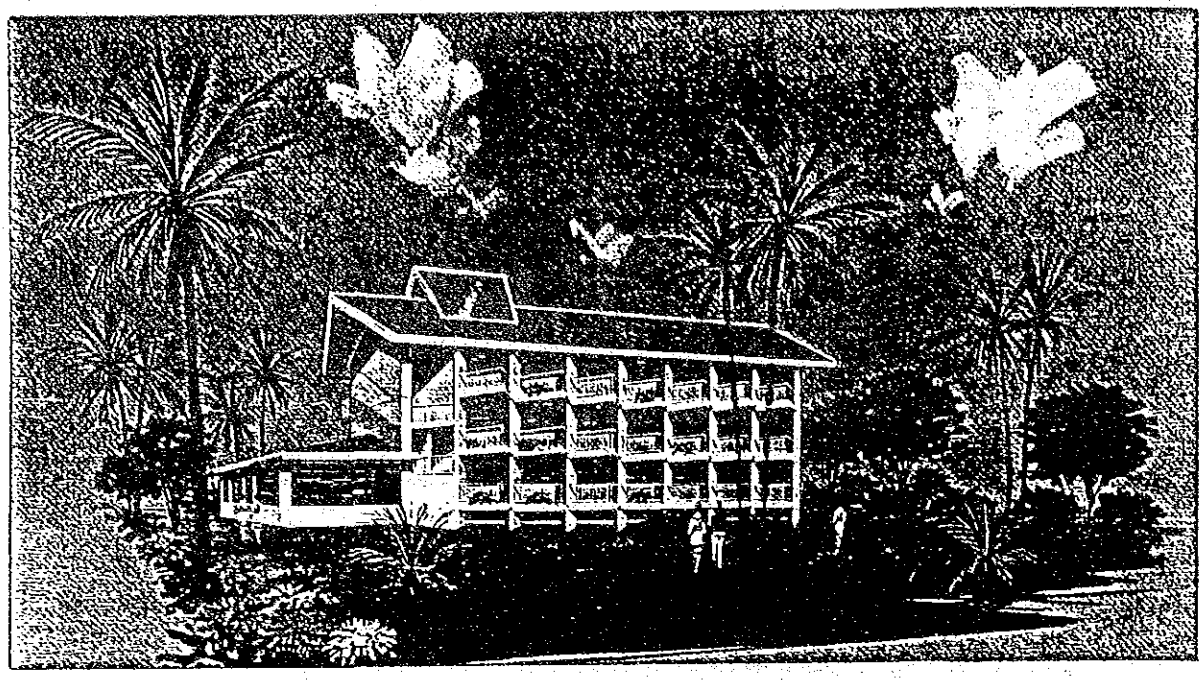


WORKSHOP (B) GROUND FLOOR

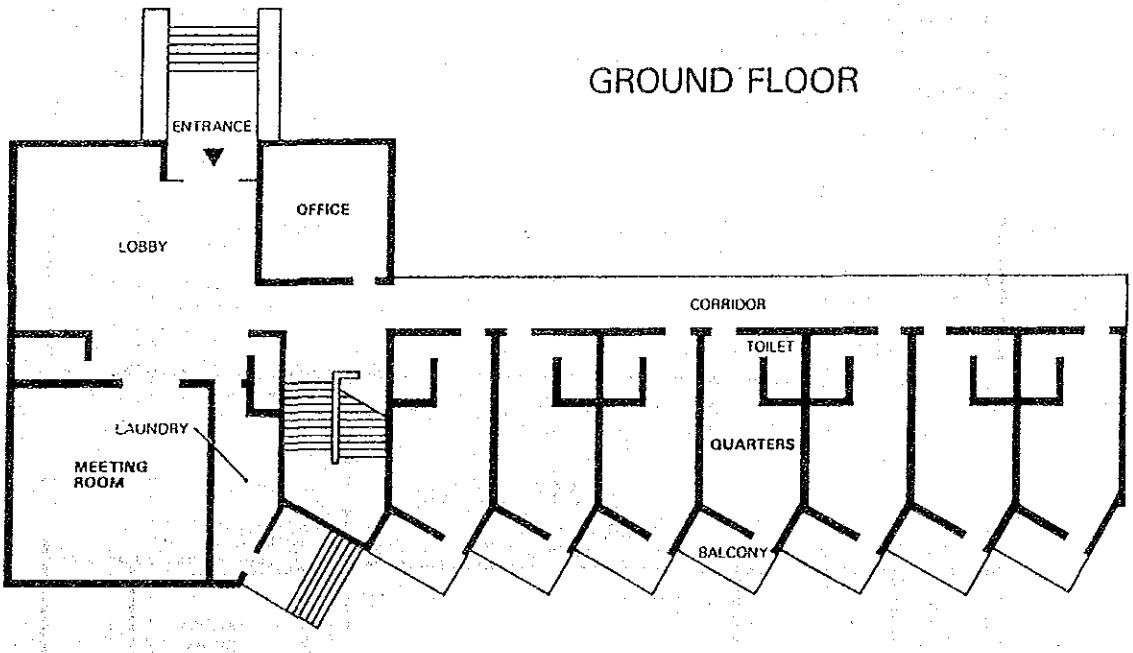


MEZZANINE

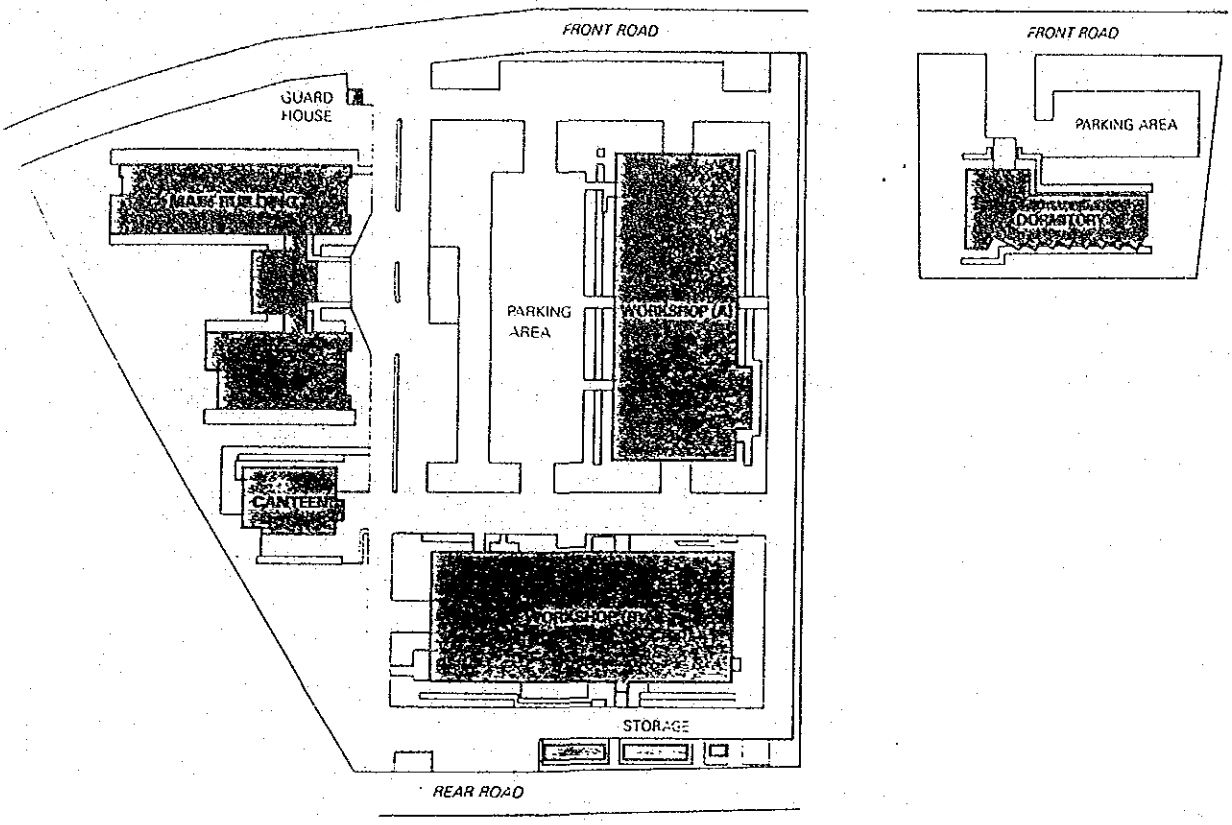




DORMITORY


GROUND FLOOR
ENTRANCE
OFFICE
LOBBY
CORRIDOR
TOILET
LAUNDRY
MEETING ROOM
QUARTERS
BALCONY

SITE PLAN



MEMO

資料4　帰国した専門家の技術移転評価表(チェック・リスト)

専　門　家　氏　名：　小　林　菊　男

カウンターパート氏名：　Mr. Worapong

指　導　科　目：　機械設計一般

派　遣　期　間：　1987. 5. 19 ～ 1988. 4. 18

CHECK LIST FOR TECHNOLOGY TRANSFER

JICA EXPERT: K.KOBAYASHI
CHIEF : Mr. SIVASAKDI
CP : Mr. WORAPONG

TECHNICAL FIELED : MACHINERY DESIGN GENERAL

SUBJECTS	ITEMS	TECH. TRANSFER B/D	TARGET LEVEL (LECTURE + DRILL)	PROGRESS OF TRANSFER (see P.3) FINISHED LECTURE	PROGRESS OF TRANSFER (%) 20 40 60 80 100	ACKNOWLEDGED by PRIME CHECK CP	PRIME CHECK CHIEF	PRIME CHECK EXPT	FINAL CHECK CP	FINAL CHECK CHIEF	FINAL CHECK EXPT	REMARKS
1 Foundamental of technical drafting	(1) General code	Basic L-1	Knowledge of main points and kind of code	Through all lecture	PRIME FINAL	W	SBD	K	W	SBD	K	
	(2) Line convention	DO.	Understanding of kind and expression for line	23/6		W	SBD	K	W	SBD	K	
	(3) Scale and dimensioning	DO.	Selection and writing way by JIS	23/6		W	SBD	K	W	SBD	K	
	(4) Indication of roughness	Basic L-2	Knowledge of symbol and roughness theory	21/7		W	SBD	K	W	SBD	K	
	(5) allowance	DO.	Suitable judgement for simple elements	24/7		W	SBD	K	W	SBD	K	
	(6) Indication of engagement	DO.	Knowledge of clasification of engagement for simple elements	24/7		W	SBD	K	W	SBD	K	
2 International standard	(1) Material symbol	Basic L-1	Knowledge of principal material symbole of JIS, DIN and ASME	Through all lecture		W	SBD	K	W	SBD	K	
	(2) Units	DO.	Judgement from order spec.	23/6		W	SBD	K	W	SBD	K	
	(3) Drawing practice	DO.	Knowledge of summary of drawind practice by JIS (ISO)	23/6		W	SBD	K	W	SBD	K	
	(4) Comparison of standard amoung main countries	DO.	Knowledge of main points for gear strength	26/6		W	SBD	K	W	SBD	K	
3 Material strength	(1) Materials and heat treatment	Basic L-2	Purpose of requirement for materials	10/9		W	SBD	K	W	SBD	K	
	(2) Strength calculation of basic machine elements	DO.	Key, bolt, shaft and spring shearing, tention & compression	21/8		W	SBD	K	W	SBD	K	
	(3) Permissible stress and safety factor	DO.	Vital rotating parts such as gear and shaft	30/6		W	SBD	K	W	SBD	K	
	(4) Fatigue strength and stress concentration	Basic L-3	Vital machine elements such as shaft	Through all lecture		W	SBD	K	W	SBD	K	

TECHNICAL FIELED : MACHINERY DESIGN GENERAL

SUBJECTS	ITEMS	TECH. TRANSFER P/D	TERGET LEVEL (LECTURE + DRILL)	PROGRESS TRANSFER (See P. 3) FINISHED LECTURE	(%) 20 40 60 80 100	ACKNOWLEDGED by PRIME CHECK CP	PRIME CHECK CHIEF	PRIME CHECK EXPT	FINAL CHECK CP	FINAL CHECK CHIEF	FINAL CHECK EXPT	REMARKS
4. Selection of application of basic elements	(1) Bolt and nut	Practical L-1	Thrust reamer, bearing cap and unit foundation	7/7	PRIME — FINAL	W	SBD	K	W	SBD	K	
	(2) Bearing	DO.	Ordinary journal bearing	13/8		W	SBD	K	W	SBD	K	
	(3) "O" ring and Oil seal	DO.	Gear box use	1/9		W	SBD	K	W	SBD	K	
	(4) Coupling	DO.	Gear coupling and rigid coupling	25/2		W	SBD	K	W	SBD	K	
5. Design and drafting of machine elements	(1) Bolt, nut and screw thread	DO.	Strength calculation and determination and kind	7/7		W	SBD	K	W	SBD	K	
	(2) Shaft and key	DO.	Calculation and determination of dimensions	30/6		W	SBD	K	W	SBD	K	
	(3) Gears	Practical L-2	Calculation and theoretical analysis of equations	10/11		W	SBD	K	W	SBD	K	
	(4) Characteristics prime mover	DO.	Influence to design condition	Throgh all Lecture		W	SBD	K	W	SBD	K	
	(5) Design for welding elements	DO.	Understanding of welding symbol and preperations	4/8		W	SBD	K	W	SBD	K	
	(6) Design for casting elements	DO.	Knowledge of suitable pattern for easy casting	25/8		W	SBD	K	W	SBD	K	
	(7) Procedure and check method of design and drafting	Practical L-1	Making of check list	17/7		W	SBD	K	W	SBD	K	
	(8) Design of lube oil system	Practical L-2	Knowledge of flow chart of lube oil for Typical unit	8/12		W	SBD	K	W	SBD	K	
	(9) Loss power	DO.	Calculation of loss power for simple unit	12/2		W	SBD	K	W	SBD	K	
	(10) Design for cost reduction	Practical L-3	One's way of thinking for cost reduction	4/3		W	SBD	K	W	SBD	K	
	(11) Production procedure	Practical L-2	Housing and rotating part	1/3		W	SBD	K	W	SBD	K	
	(12) Summary of bevel and worm gears	(Practical L-3)	Understanding of equation (only text)	—		W	SBD	K	W	SBD	K	

TECHNICAL FIELED : MACHINERY DESIGN GENERAL

SUBJECTS	ITEMS	TECH. TRANSFER B/D	TARGET LEVEL (LECTURE + DRILL)	PROGRESS TRANSFER FINISHED LECTURE	PROGRESS TRANSFER (%) 20 40 60 80 100	ACKNOWLEDGED by PRIME CHECK C P	PRIME CHECK CHIEF	PRIME CHECK EXPT	FINAL CHECK C P	FINAL CHECK CHIEF	FINAL CHECK EXPT	REMARKS
6. Trouble shooting	(1) Shaft and key	Practical L-3	To be studied the procedure of find out for cause and countermeasures for trouble on several cases.	22/1	FINAL	W	SBD	K	W	SBD	K	
	(2) Oil seal and bearing	Do.		19/1		W	SBD	K	W	SBD	K	
	(3) Gears	Do.		29/1		W	SBD	K	W	SBD	K	
	(4) Causes of noise and vib.	Do.		26/1		W	SBD	K	W	SBD	K	
	(5) Temperature rising	Do.		26/1		W	SBD	K	W	SBD	K	
						~~W~~	K ~~SBD~~		K ~~W~~	K ~~SBD~~		
7. Design control	(1) Maintenance and drafting	Practical L-1	Arrangement of drawings and technical datas	16/6		W	SBD	K	W	SBD	K	
	(2) Flowing of drawing	Do.	Study of systematic flow of drawing	16/6		W	SBD	K	W	SBD	K	
	(3) Design manual	Do.	Understanding of design manual	16/6		W	SBD	K	W	SBD	K	
	(4) Concept of standardization	Basic L-2	Understanding of necessity of standardization	16/6		W	SBD	K	W	SBD	K	
8. Application	(1) Thermal rate	Practical (L-3)	Calculation of Thermal rate for simple gear unit	11/12		W	SBD	K	W	SBD	K	
	(2) Shrinkage fit	(DO.)	Calculation of grasping force between rim & shaft	15/12		W	SBD	K	W	SBD	K	
	(3) Alignment	(DO.)	Knowledge of problem due to mis-alignment	25/12		W	SBD	K	W	SBD	K	
	(4) Fly wheel	(DO.)	Energy of fly wheel	13/1		W	SBD	K	W	SBD	K	
	(5) Components of lube Oil system	Practical L-1	Summary of tank, strainer cooler, pump, oil sight and etc.	1/11		W	SBD	K	W	SBD	K	
The others				—		W	SBD	K	W	SBD	K	

＜参考資料＞

→ Schedule
V Lecture
---------- Preparation of Text

TRAINING SCHEDULE OF MACHINE DESIGN GENERAL

MAY 1987 - FEB.1988

Original schedule

Written by K.Kobayashi

ITEM \ DATE	1987 May	June	Jul.	Aug.	Sept.	Oct.	Nov.	Dec.	1988 Jan.	Feb.	Remarks
Preparation	→										
Factory Visits	→										
Staff Training											
(1)Design control	V→	Arrange of technical data, Drawing check, etc., text,					text lecture 2	hrs.			
(2)Base of drafting	V V→			text,	lecture 4 hrs.						
(3)Standards	V→			mainly material,		text, lecture 2 hrs.					
(4)Strength calculation for machine elements											
Key and shaft	V→			Dimension and strength,		text,	lecture 2 hrs.				
Bolt and beam	V→			Dimension and strength, text,		lecture 2 hrs.					
Knock pin and spring	V→			Dimension and strength, text, lecture		2 hrs.					
(5)Tolerance amount	V→	Selection of rough or precision surfaces									
(6)Finishing degree	V→	RMS	AR	Text, lecture 2 hrs.							
(7)Welding design	V→	Edge preparation, Deformation, text, lecture 2 hrs.									
(8)Casting design	V→	Casting design, text, lecture 2 hrs.									
(9)Material	Text, lecture 2 hrs. V→	Fatique strength, Mechanical prop., chemical comp. and etc.									
(10)Bearings	Text,	lecture 4 hrs. V V→	Roller, sleeve and thrust brgs, bearing reaction,								
(11)Gears	Text, lecture,	10 hrs. V V V V V→	Gear and strength								
(12)Oil seal and O ring	Kind and function	V→	text, lecture 2 hrs.								
(13)Cal. of gear datas	V→	Presentation by MIDI staff									
(14)Cal. of bearing loads	V→	Presentation by MIDI staff									
(15)Cal. of parts	V→	Presentation by MIDI staff									
(16)Lubrication		text, lecture 2 hrs. V→									
(17)Components of lube oil system		Ditto V→									
(18)Maintenance of lube oil		Ditto V→									
(19)Thermal rate		Ditto V→									
(20)Selection of lube oil		Ditto V→									
(21)Loss power		Ditto V→									
(22)Shrinkage fit		Ditto V→									
(23)Alignment		Ditto V→									
(24)Trouble shooting		Ditto V→									
(25)Unit design											
(26)O J T											

Notice : 1. Above mentioned training schedule may be changed according to another business.
2. If necessary, Training items will be increased or changed.
3. Lecture period of one time will be taken about 2 hrs.

(注) 本参考資料は小林菊男専門家が赴任時にあらかじめ持参した案を，赴任後タイ側と協議のうえ一部修正して作成した同専門家派遣期間（当初の派遣期間は1987年5月～1988年2月）の全般にわたる時系列的技術移転計画である。

専　門　家　氏　名：　神　山　　達

カウンターパート氏名：　Mr. Rapee

指　導　科　目：　材料試験・検査

派　遣　期　間：　1987. 6. 5 ～ 1988. 3. 4

CHECK LIST FOR TECHNOLOGY TRANSFER

JICA expert : T. KAMIYAMA (神山達)
MIDI chief : MR. PAIBOON C.
MIDI C. P : MR. RAPEE

TECHNICAL FIELD: Material testing and Inspection

No.	Items	Target Level	Correspondence to scope of the Technical Transfer R/D	Progress of Transfer(%) 20 40 60 80 100	Acknowledged by 1st check C.P	1st check Chief	1st check Exp't	2nd check C.P	2nd check Chief	2nd check Exp't
1	Measuring instruments	o The use of micrometer o The use of calibrater	Basic/LV-1 do.		Rch		Toru Kamiyama	Rch		Toru Kamiyama
2	Universal testing machine 2-1 Operation of material testing machine	o To master the operation of universal testing machine	Practical/LV-2		Rch			Rch		
		o To learn preparation of test pieces and their installation	do.		Rch			Rch		
		o To master the operation of test technology	"		Rch		Toru Kamiyama	Rch		Toru Kamiyama
		o To master obtaining the tensile test values 1) Tensile strength 2) Yield point (High and Low) 3) Elongation 4) Reduction of area	"		Rch			Rch		

CHECK LIST FOR TECHNOLOGY TRANSFER

JICA expert : T. KAMIYAMA
MIDI chief :
MIDI C. P :

TECHNICAL FIELD: Material testing and Inspection

No.	Items	Target Level	Correspondence to scope of the Technical Transfer R/D	Progress of Transfer(%) 20 40 60 80 100	Acknowledged by 1st check C.P	1st check Chief	1st check Exp't	2nd check C.P	2nd check Chief	2nd check Exp't
	2-2 Operation of X-Y recorder	o To master the operation of X-Y recorder	Practical/LV-1							
		o Checking accuracy of X-Y recorder Inspection of X-Axis Inspection of Y-Axis "Calibration device" (SC-25)	Practical/LV-2							
	2-3 Operation of the extensometer (ST-50-5-25)	o To master the operation of extensometer (ST-50-5-25)	Practical/LV-2							
		o To acquire Yield point of 0.2% off set	do.							
	2-4 Operation of the ring type load call	o To master the operation of ring type load cell	Practical/LV-2							
		o Accuracy control of universal testing machine	do.							
		o To correct the error on load guide	"							

CHECK LIST FOR TECHNOLOGY TRANSFER

JICA expert : T. KAMIYAMA
MIDI chief :
MIDI C. P :

TECHNICAL FIELD: Material testing and Inspection

No.	Items	Target Level	Correspondence to scope of the Technical Transfer R/D	Progress of Transfer(%) 20 40 60 80 100	Acknowledged by 1st check C.P	1st check Chief	1st check Exp't	2nd check C.P	2nd check Chief	2nd check Exp't
	2-5 Bending test	o To master push bend test for metal plate	Applied/LV-2		Rel	Pr	Toru Kamiyama	Rel	Pr	Toru Kamiyama
		o To learn flexure test of cast iron	do.		Rel	Pr		Rel	Pr	
		o Others application for fabricated materials "concrete block, etc."	"		Rel	Pr		Rel	Pr	
	2-6 Safety operation and maintenance inspection	o Preparation of safety operation standards for testing machine	Practical/LV-2		Rel	Pr		Rel	Pr	
		o Maintenance, inspection and control of equipment	do.		Rel	Pr		Rel	Pr	
3	Vickers hardness tester	o To master the operation of vickers hardness tester	Practical/LV-2		Rel	Pr	Toru Kamiyama	Rel	Pr	Toru Kamiyama
		o To learn preparation of test pieces and their installation	do.		Rel	Pr		Rel	Pr	
		o To learn relation between hardness values and their corresponding tensile strength	"		Rel	Pr		Rel	Pr	
		o To learn measure the hardened zone and softened zone	"		Rel	Pr		Rel	Pr	
		" Boundary layer of butt " welded joint								

CHECK LIST FOR TECHNOLOGY TRANSFER

JICA expert : T. KAMIYAMA
MIDI chief :
MIDI C. P :

TECHNICAL FIELD: Material testing and Inspection

No.	Items	Target Level	Correspondence to scope of the Technical Transfer R/D	Progress of Transfer(%) 20 40 60 80 100	Acknowledged by 1st check C.P	1st check Chief	1st check Exp't	2nd check C.P	2nd check Chief	2nd check Exp't
4	Micro vickers hardness tester	o To master the operation of micro vickers hardness tester	Practical/LV-2		Rel	P	Toru Kamiyama	Rel	P	Toru Kamiyama
		o To learn preparation of test pieces and their installation	do.		Rel	P		Rel	P	
		o To master the operation of the dataletty 150	"		Rel	P		Rel	P	
5	Brinell hardness tester	o To master the operation of brinell hardness tester	Practical/LV-2		Rel	P	Toru Kamiyama	Rel	P	Toru Kamiyama
		o To learn combination of load and steel ball	do.		Rel	P		Rel	P	
6	Rockwell hardness tester	o To master the operation of rockwell hardness tester	Practical/LV-2		Rel	P	Toru Kamiyama	Rel	P	Toru Kamiyama
		o To learn combination of indenter (penetrater) and testing load "A, B and C scale"	do.		Rel	P		Rel	P	
		o To learn relation between hardness values and their corresponding tensile strength	"		Rel	P		Rel	P	

CHECK LIST FOR TECHNOLOGY TRANSFER

JICA expert : T. KAMIYAMA
MIDI chief :
MIDI C. P :

TECHNICAL FIELD: Material testing and Inspection

No.	Items	Target Level	Correspondence to scope of the Technical Transfer R/D	Progress of Transfer(%) 20 40 60 80 100	Acknowledged by 1st check C.P	1st check Chief	1st check Exp't	2nd check C.P	2nd check Chief	2nd check Exp't
7	Shore hardness tester	o To master the operation of shore hardness tester	Practical/LV-2							
		o Finished grade of measuring surface number of measurement	do.				Toru Kamiyama			Toru Kamiyama
8	Impact tester	o To master the operation of charpy impact tester	Practical/LV-1							
		o Obtaining impact value · observation of fracture surface	do.							
		o To learn low temperature notch britteness testings 1) Absorbed energy transition temperature "VTr E" 2) Fracture surface transition temperature "VTr S" 3) 15ft-lb transition temperature "VTr 15"	Practical/LV-2				Toru Kamiyama			Toru Kamiyama
		o Maintenance, inspection and control of equipment	Practical/LV-2							

CHECK LIST FOR TECHNOLOGY TRANSFER

JICA expert : T. KAMIYAMA
MIDI chief :
MIDI C. P :

TECHNICAL FIELD: Material testing and Inspection

No.	Items	Target Level	Correspondence to scope of the Technical Transfer R/D	Progress of Transfer(%) 20 40 60 80 100	Acknowledged by 1st check C.P	1st check Chief	1st check Exp't	2nd check C.P	2nd check Chief	2nd check Exp't
9	Inspection date judgement	o Summarizing the date and judgement	Practical/LV-2		Rck	P	Toru Kamiyama	Rck	P	Toru Kamiyama
10	Preparation of inspection recoad	o Recording the data and analysis	Practical/LV-2		Rck	P	Toru Kamiyama	Rck	P	Toru Kamiyama
11	Test and inspection regulations and standards of various kinds	o Standardization test	Basic/LV-2		Rck	P	Toru Kamiyama	Rck	P	Toru Kamiyama
12	Planning of test and inspection	o Working conditions o Test order	Basic/LV-2 do.		Rck	P	Toru Kamiyama	Rck	P	Toru Kamiyama

専　門　家　氏　名：早　川　雅　彦

カウンターパート氏名：　Mr. Kittipat

指　導　科　目：金属組織

派　遣　期　間：　1987. 6. 5 ～ 1988. 2. 4

CHECK LIST FOR TECHNOLOGY TRANSFER

JICA expert : Mr. M. HAYAKAWA (早川雅彦)
MIDI chief : MR. PAIBOON C.
MIDI C. P : MR. KITTIPAT

TECHNICAL FIELD: METALLOGRAPHY

No.	Items	Target Level	Correspondence to scope of the Technical Transfer R/D	Progress of Transfer(%) 20 40 60 80 100	Acknowledged by 1st check C.P	Chief	Exp't	2nd check C.P	Chief	Exp't
I	Optical Microscopic Test									
1	To learn the operation of optical microscope	a) part name of optical microscope b) operation	Basic/LV-1,2 Practical/LV-1, 2					K.P.	P✓	M.H
2	To learn the treating of related apparatus	a) part name of each related apparatus b) operation c) special attention-matters	do.					K.P. K.P.	P✓ P✓	M.H M.H
3	Treating of chemical reagents (for etching)	a) name of chemical reagents b) treatment and special attention-matters	"					K.P. K.P.	P✓ P✓	M.H M.H
4	Treating of photographic apparatus	a) name of related photographic apparatus b) treatment and special attention-matters	"					K.P. K.P.	P✓ P✓	M.H M.H
5	To master the making method of test pieces	a) sampling location b) cutting, washing, pruging, polishing and etching	Practical/LV-2					K.P. K.P.	P✓ P✓	M.H M.H
6	Observation of microstructure and photographing	a) film selection b) photographing	do.					K.P. K.P.	P✓ P✓	M.H M.H
7	D.P.E.	a) developing b) printing	"					K.P. K.P.	P✓ P✓	M.H M.H

CHECK LIST FOR TECHNOLOGY TRANSFER

JICA expert : Mr. M. HAYAKAWA
MIDI chief :
MIDI C. P :

TECHNICAL FIELD: METALLOGRAPHY

No.	Items	Target Level	Correspondence to scope of the Technical Transfer R/D	Progress of Transfer(%) 20 40 60 80 100	Acknowledged by 1st check C.P	Chief	Exp't	2nd check C.P	Chief	Exp't
8	Maintenance, inspection and control of optical microscope and related apparatus	a) exchange of spare parts b) easy trouble shooting c) periodical inspection	Practical/LV-2,3					K.P. P✓ M.H K.P. P✓ M.H M.H		
9	Application	a) plan making of test and inspection b) report making of results of test and inspection c) estimation and identification of results	Practical/LV-2,3 Applied/LV-2,3					K.P. P✓ M.H K.P. P✓ M.H K.P. P✓ M.H		
II	Scanning Electron Microscopic Test									
1	To learn the operation of scanning electron microscopy	a) part name of scanning electron microscopy b) operation c) special attention-matters	Basic/LV-1,2 Practical/LV-1,2					K.P. P✓ M.H K.P. P✓ M.H K.P. P✓ M.H		
2	To learn the treating of related apparatus	a) part name of each related apparatus b) operation c) special attention-matters	do.					K.P. P✓ M.H K.P. P✓ M.H K.P. P✓ M.H		
3	To master the making method of test pieces	a) sampling location b) cutting (fracture surface opening) c) cleaning and vapour deposition for fracture surface	"					K.P. P✓ M.H K.P. P✓ M.H K.P. P✓ M.H		

CHECK LIST FOR TECHNOLOGY TRANSFER

JICA expert : Mr. M. HAYAKAWA
MIDI chief :
MIDI C. P :

TECHNICAL FIELD: METALLOGRAPHY

No.	Items	Target Level	Correspondence to scope of the Technical Transfer R/D	Progress of Transfer(%) 20 40 60 80 100	Acknowledged by 1st check C.P	Chief	Exp't	2nd check C.P	Chief	Exp't
4	Observation of microstructure and photographing	a) observation b) photographing (poraloid and film) c) D.P.E.	Basic/LV-1,2 Practical/LV-1,2					K.P. K.P. K.P.	P P P	M.H M.H M.H
5	Maintenance, inspection and control for scanning election microscopy and related apparatus	a) exchange of spare parts b) periodical cleaning and inspection c) easy trouble shooting	Basic/LV-2 Practical/LV-1,2,3					K.P. K.P. K.P.	P P P	M.H M.H M.H
6	Application (observation of destructed materials or defects investigation cause study)	a) plan making of test and inspection b) report making of results of test and inspection c) investigation report of damaged materials o destructed forms and types o characteristics of fracture surface o estimation and identification of results o resulted priventive measures	Practical/LV-2,3 Applied/LV-2,3					K.P. K.P. K.P. K.P. K.P. K.P. K.P.	P P P P P P P	M.H M.H M.H M.H M.H M.H M.H
III	Microstructure Detecting Method		Practical/LV-2,3							
1	Points of test piece making	a) sampling of test pieces b) grinding and polishing c) etching (chemical, electrolitic and boiling)						K.P K.P K.P	P P P	M.H M.H M.H

CHECK LIST FOR TECHNOLOGY TRANSFER

JICA expert : Mr. M. HAYAKAWA
MIDI chief :
MIDI C. P :

TECHNICAL FIELD: METALLOGRAPHY

No.	Items	Target Level	Correspondence to scope of the Technical Transfer R/D	Progress of Transfer(%) 20 40 60 80 100	Acknowledged by 1st check C.P	1st check Chief	1st check Exp't	2nd check C.P	2nd check Chief	2nd check Exp't
2	Observation of structure and picture taking	a) observation b) photographing c) estimation and identification						KP KP KP	P✓ P✓ P✓	M.H M.H M.H
IV	Method of Sulphur Print Test		Practical/LV-2,3							
1	Points of test piece making	a) sampling of test pieces b) grinding and polishing c) cleaning and oiliness						KP KP KP	P✓ P✓ P✓	M.H M.H M.H
2	Points of sulphur printing	a) chemical reagent and printing paper b) method of press c) fixing and drying of prints d) estimation and identification						KP KP KP KP	P✓ P✓ P✓ P✓	M.H M.H M.H M.H
V	Method of Grain Size Test		Practical/LV-2,3							
1	Points of test piece making	a) heating (heat treatment) b) sampling and pruging of test pieces c) grinding and polishing d) etching								

CHECK LIST FOR TECHNOLOGY TRANSFER

JICA expert : Mr. M. HAYAKAWA
MIDI chief :
MIDI C. P :

TECHNICAL FIELD: METALLOGRAPHY

No.	Items	Target Level	Correspondence to scope of the Technical Transfer R/D	Progress of Transfer(%) 20 40 60 80 100	Acknowledged by 1st check C.P	Chief	Exp't	2nd check C.P	Chief	Exp't
2	Observation, measurement and identification of grain size	a) observation and measurement b) estimation and identification								
VI	Advice on drafting of TIS for material testing and inspection		Applied/LV-2	═══				KP.	P~	M.H.

専　門　家　氏　名：　鈴　木　道　雄

カウンターパート氏名：　Mr. Narong

指　導　科　目：　簡易自動化

派　遣　期　間：　1987. 9. 18 ～ 1988. 1. 17

LOW-COST AUTOMATION
CHECK LIST FOR TECHNOLOGY TRANSFER (M. SUZUKI)

BASIC TECHNOLOGY

ITEM	TARGET LEVEL	PROGRESS OF TRANSF. 30 50 90 100	ACKNOWLEDGED BY CP	C	E
(HYDRAULICS)					
1. DRAWING PRACTICE & SYMBOL					
(1) BASIC TERMS	TO UNDERSTAND THE HYD. COMPONENTS ABOUT PRINCIPLE, CONSTRUCTION AND FUNCTION. (TEXT: UCHIDA HYD. TEXT(1))	o	H.T.	S.S.	M.S.
(2) HYDRAULIC PUMP		o	〃	〃	
(3) HYDRAULIC MOTOR		o	〃	〃	
(4) CYLINDER		o	〃	〃	
(5) RELIEF VALVE		o	〃	〃	
(6) REDUCING VALVE		o	〃	〃	
(7) SEQUENCE VALVE		o	〃	〃	
(8) DIRECTIONAL CONT. VALVE		o	〃	〃	
(9) FLOW CONT. VALVE		o	〃	〃	
(10) SERVO VALVE		o	〃	〃	
(11) ELECTRO-MAGNET. PROP. V.		o	〃	〃	
(12) ACCESSORIES		o	〃	〃	
(13) BASIC CALCULATION		o	〃	〃	
- CYLINDER		o	〃	〃	
- MOTOR		o	〃	〃	
- PUMP & ELECT MOTOR		o	〃	〃	
2. BASIC CIR. OF HYD. CONT. SYSTEM					
(1) UNLOADING CIRCUIT	BASIC HYD. CIRCUIT AND ELECTRIC WIRING CIRCUIT HAVE TO BE ACCOMPLISHED BY USING TRAINING KIT. (TEXT: SAKURA MANU.	o	〃	〃	M.S.
(2) METER-IN CIRCUIT		o	〃	〃	
(3) METER-OUT CIRCUIT		o	〃	〃	

LEVEL-1

LEVEL-2

LOW-COST AUTOMATION

	ITEM	TARGET LEVEL	PROGRESS OF TRANSFER 0 5 7 10	ACKNOWLEDED BY CP	O	E
BASIC TECHNOLOGY LEVEL 2	(4) BLEED-OFF CIRCUIT	BASIC HYD. CIRCUIT	O			
	(5) REGENERATIVE CIRCUIT	AND ELECTRIC WIRING	O			
	(6) COUNTER BALANCE CIR.	CIRCUIT HAVE TO BE	O			
	(7) HIGH-LOW CIRCUIT	ACCOMPLISHED,	O			
	(8) SEQUENCE CIRCUIT	BY USING TRAINING	O			
	(9) AUTOMATIC RECIPRO. CIR.	KIT.	O			
	(10) TWO SPEED CONT. CIRCUIT	(TEXT: SAKURA MANU)	O			
PRACTICAL TECH. LEVEL 1	3. DESIGN & DRAFTING	PRINCIPAL HYD. CIRCUIT DESIGN				
	(1) CYLINDER CIR. CALCULATION	SHALL BE COMPLETED	O			
	(2) HYD MOTOR CIR. CALCULATION	BY USING CYLINDER AND MOTOR INCLUDING	O			
		ACCESSORIES.				
		(TEXT; UCHIDA EXERCISE)				
BASIC TECHNOLOGY LEVEL 1	(MICRO-COMPUTER)					
	1. BASIC MODULE	TO UNDERSTAND	O			
	2. PRACTICAL MODULE	THE FUNDAMENTAL	O			
	3. APPLICATION MODULE	MODULE.	O			
		(TEXT: MI-CON MODULE)				
BASIC TECHNOLOGY LEVEL 2	4. Z-80 COMMAND INSTRUCT.		O			
	5. PROGRAMMING	TO UNDERSTAND	O			
	6. APPLICATION PROGRAM	THE FUNDAMENTAL COMMAND AND	O			
		TO MAKE THE PROGRAM				
		FOR DEMONSTRATION.				
		(TEXT: PROGRAMMING DRILL)				

専　門　家　氏　名：荒　井　孝　志

カウンターパート氏名：Mr. Somdej

指　導　科　目：視聴覚教材作成

派　遣　期　間：1988.7.8～1988.9.7（第1回派遣）

CHECK LIST FOR TECHNOLOGY TRANSFER

JICA expert : T. Arai
MIDI chief :
MIDI C. P : Somdej

TECHNICAL FIELD:

No.	Items	Target Level	Correspondence to scope of the Technical Transfer R/D	Progress of Transfer(%) 20 40 60 80 100	Acknowledged by 1st check C.P	Chief	Exp't	2nd check C.P	Chief	Exp't
1.	Video Programe Process	To Understand the basic of... 1.1 Video Programe Production Process 1.2 Key Point for Video Programme Process			Somdej	Damri	Arai			
2.	Story and Script Making	To Understand the basic of... 2.1 Planning 2.2 Collecting Information and research 2.3 Organizing Information and choice 2.4 How to make the script			Somdej	Damri	Arai			
3.	How to operate Video Camera	To Understand the practical-skill of... 3.1 Objective shot and Subjective shot			Somdej	Damri	Arai			

CHECK LIST FOR TECHNOLOGY TRANSFER

JICA expert : T. Arai
MIDI chief :
MIDI C. P : Somdej

TECHNICAL FIELD:

No.	Items	Target Level	Correspondence to scope of the Technical Transfer R/D	Progress of Transfer(%) 20 40 60 80 100	Acknowledged by 1st check C.P	1st check Chief	1st check Exp't	2nd check C.P	2nd check Chief	2nd check Exp't
		3.2 Shooting Position 3.3 Shooting Angle 3.4 Framing 3.5 Practical way of Shooting Position (Studio, Indoor, Outdoor)			Somdej	Demi	Arai			
4.	Function of Video Camera	To Understand the practical skill of... 4.1 Forcusing 4.2 Zooming 4.3 Panning and Tilting 4.4 Dolly 4.5 Tracking 4.6 Close-up 4.7 Difference between Panning and Tracking			Somdej	Demi	Arai			

CHECK LIST FOR TECHNOLOGY TRANSFER

JICA expert : T. Arai
MIDI chief :
MIDI C. P : Somdej

TECHNICAL FIELD:

No.	Items	Target Level	Correspondence to scope of the Technical Transfer R/D	Progress of Transfer(%) 20 40 60 80 100	Acknowledged by 1st check C.P	1st check Chief	1st check Exp't	2nd check C.P	2nd check Chief	2nd check Exp't
5.	Video Shooting Method	To Understand the practical skill of...			Somdech	Domi	Arai			
		5.1 Outdoor shooting (General Technique, High Technique)								
		5.2 Indoor shooting :-			Somdech	Domi	Arai			
		- MIDI Studio								
		- MIDI Lecture room								
		- MIDI Workshop								
		- Others								
		5.3 Lighting Technique :-			Somdech	Domi	Arai			
		- MIDI Studio								
		- MIDI Lecture Room								
		- MIDI Workshop								
		- Others								
		5.4 Interview Technique :-			Somdech	Domi	Arai			
		- Outdoor								
		- Indoor								

CHECK LIST FOR TECHNOLOGY TRANSFER

JICA expert : T. Arai
MIDI chief :
MIDI C. P : Somdej

TECHNICAL FIELD:

No.	Items	Target Level	Correspondence to scope of the Technical Transfer R/D	Progress of Transfer(%) 20 40 60 80 100	Acknowledged by 1st check C.P	1st check Chief	1st check Exp't	2nd check C.P	2nd check Chief	2nd check Exp't
6.	Sounding Technical for Video Production	To Understand the practical skill of... 6.1 Microphone Using Technique 6.2 Sound Effect 6.3 Music			Somdech.	Damri	Arai			
7.	Editting Method	To Understand the practical skill of... 7.1 Action to Action 7.2 Editting point 7.3 Adjuting Movement direction 7.4 Frame In and Out 7.5 Reaction Insert Method 7.6 How to use Transition Shot 7.7 How to make title and Flip Chart			Somdech	Damri	Arai			

CHECK LIST FOR TECHNOLOGY TRANSFER

JICA expert : T. Arai
MIDI chief :
MIDI C. P : Somdej

TECHNICAL FIELD:

No.	Items	Target Level	Correspondence to scope of the Technical Transfer R/D	Progress of Transfer(%) 20 40 60 80 100	Acknowledged by 1st check C.P	1st check Chief	1st check Exp't	2nd check C.P	2nd check Chief	2nd check Exp't
8.	Presentation and Evaluation	7.8 Dubbing Method :- - Audio Planning - Mixing Planning - Practical Dubbing Method 7.9 Special Effects To Understand the practical skill of... - Presentation and Evaluation			Somdej	Damri	Arai			
					Somdej	Damri	Arai			
					Somdej	Damri	Arai			

専　門　家　氏　名：　上　野　　滋

カウンターパート氏名：　Mr. Paiboon　Chu

指　導　科　目：　精密測定

派　遣　期　間：　1988. 8. 31 ～ 1988. 10. 1

JICA expert : S.UENO
MIDI chief :
MIDI C. P : Shuhei Hasegawa.

TECHNICAL FIELD: INDUSTRIAL METROLOGY

No.	Items	Target Level	Correspondence to scope of the Technical Transfer R/D	Progress of Transfer(%) 20 40 60 80 100	Acknowledged by 1st check C.P	1st check Chief	1st check Exp't	2nd check C.P	2nd check Chief	2nd check Exp't
1	FOUNDATION OF METOROLOGY	KNOWLEDGE OF LENGTH STANDARD	LEVEL I							
	GAGE BLOCK	KNOWLEDGE OF GAGE BLOCK GAGE BLOCK OPERATION								
	THERMAL EFFECT	UNDERSTANDING THERMAL EFF.								
	GRAVITY EFFECT	UNDERSTANDING GRAVITY EFF.								
	MEASURING FORCE EFF	UNDERSTANDING MEASURING FORCE EFFECT.								
2	FORM MEASUREMENT	KNOWLEDGE OF FORM MEASUREMENT	LEVEL II							
	INTERNATIONAL STD.	UNDERSTANDING ISO ITEMS								
	ANGLE MEASUREMENT	UNDERSTANDING ANGLE MEASURE BY AUTO-COLLIMATER								
	STRAIGHTNESS MEASUREMENT	UNDERSTANDING AUTO-COLLIMATOR APPLICATION								
	SQURENESS MEASUREMENT	SAME ABOVE								
	SURFACE ROUGHNESS	UNDERSTANDING ROUGHNESS TESTER OPERATION								
	ROUNDNESS MEASUREMENT	UNDERSTANDING ROUNDNESS TESTER OPERATION								

JICA expert : S.UENO
MIDI chief :
MIDI C. P : phailed chaopagate

TECHNICAL FIELD: INDUSTRIAL METROLOGY

No.	Items	Target Level	Correspondence to scope of the Technical Transfer R/D	Progress of Transfer(%) 20 40 60 80 100	Acknowledged by 1st check C.P	1st check Chief	1st check Exp't	2nd check C.P	2nd check Chief	2nd check Exp't
3	INDUSTRIAL METROLOGY	KNOWLEDGE OF INDUSTRIAL METROLOGY, GAGE AND INSPECTION	LEVEL II							
	BASIC INSTRUMENT	UNDERSTANDING CALIPER OPE.								
		UNDERSTANDING MICROMETER OPERATION								
		UNDERSTANDING DIAL GAGE OPERATION								
	DIGITAL INSTRUMENT	KNOWLEDGE OF DIGITAL INSTRUMENT								
		UNDERSTANDING DIGITAL MICRO METER OPERATION								
		UNDERSTANDING DIGITAL GAGE OPERATION								
	COORDINATE MEASUREMENT	KNOWLEDGE OF COORDINATE MEASUREMENT								
	TOOL MICROSCOPE	UNDERSTANDING TOOL MICROSCOPE OPERATION								
	PROJECTOR	UNDERSTANDING PROJECTOR OPERATION								
	COORDINATE MEASURING MACHINE	UNDERSTANDING CMM OPERATION								

JICA expert : S. UENO
MIDI chief :
MIDI C. P : phaibul chaopugdee

TECHNICAL FIELD: INDUSTRIAL METROLOGY

No.	Items	Target Level	Correspondence to scope of the Technical Transfer R/D	Progress of Transfer(%) 20 40 60 80 100	Acknowledged by 1st check C.P	1st check Chief	1st check Exp't	2nd check C.P	2nd check Chief	2nd check Exp't
4	METOROLOGY APPLI-CATION	KNOWLEDGE OF METROLOGY APP-LICATION	LEVEL II	———	p.c					
	ACCURACY CHECK CMM ACCURACY LATHE ACCURACY	UNDERSTANDING PRACTICAL MEASUREMENT AND INSTRUMENTS OPERATION THROUGH CMM ACCURACY CHECK		———	p.c					
		LATHE ACCURACY CHECK			/c					

資料５　次年度(1989タイ会計年度)における
MIDI事業計画及び研修日程案
(タイ側作成資料)

Target and Strategy of MIDI for Fiscal Year 1989

TARGET :

1.	To conduct effective training course on manufacturing technologies	50	courses
2.	To provide testing and inspection services	200	cases
3.	To provide technical consultancy services 6 cases on the firm-by-firm basis and in general	450	cases
4.	To produce technical report, news and manufacturing technology text	20	items
5.	To study techno - economic situation of specific industries	4	industries
6.	To experiment and manufacture of Prototype machine tool	4 300	machines/ pieces

EXPECTED RESULT :

1. To increase investment in both expansion and new establishment of 50 small and medium scale metal working and machinery factories in the whole country. Total investment is 1,000 million Baht and create 2,000 employments in industrial sector.

2. To improve efficiency of existing factories value 200 million Baht.

TARGET INDUSTRIES :

Target industries can be divided into 2 groups :

1. Metal working process industries; there are 7 processes namely Foundry, Machining, Heat treatment, Electro-plating, Welding and Sheet metal, Low cost automation system and press work.

2. Metal product industries; there are 7 products namely Agriculture Machines, Machine tool, Hand tool, Mold and die, Pump and valve, Gear and auto-parts and machine parts.

OPERATIONAL GUIDANCE :

1. To increase more activities on factoried improvement, testing and inspection services, and trasfer of metal working tech-mologies for small and medium scale industry.

2. To have a close cooperation with private sector in the field of research and development and Central Macheine Services.

3. To cooperate with Small Industrial Finance Office (SIFO). MIDI will set high priority to provide technical services for the metal working and machinery factories which received loan from SIFO in order to improve their manufacturing efficiency.

4. To be the information center and core organization for the promotion of the Metal Working and Machinery Industries.

STRATEGY :

1. Entrepreneur/Worker Development Strategy

   - To conduct a complete training program for target industries namely Mold and Die and Electro-plating.

   - To promote setting up the Mold and Die Forum.

   - To provide extension service to 6-12 factories on a Firm-by-Firm Basis in order to improve their manufacturing efficiency. The services provided, will be stressed on SIFO clients.

   - To conduct training courses upon requested in both theory and practical in order to improve entrepreneur's capability.

   - To provide technical information service.

   - Expert Pool program

2. Product Quality Development Strategy

- To provide testing and inspection services and cooperate with Thailand Industrial Standard Institute (TISI).

- To cooperate with private sector in the field of Engineering Design and machine tool prototype making.

- To cooperate with foreign metalworking firms for technology transfer and Investment.

- To provide Central Precision Machine Services for small and medium scale factories.

- To conduct training courses on testing and inspection method, quality control and production control.

MIDI

Training Schedule for the Fiscal Year 1989

No.	Name of Courses	Place	Period
1.	Basic Principle of Electro-Plating	MIDI	November 1 - 3, 1988
2.	Plastic Injection Mould Design	MIDI	November 8 - 29, 1988
3.	Heat Treatment	MIDI	November 16 - 18, 1988
4.	Pneumatic in LCA System	MIDI	November 23 - 25, 1988
5.	Ornamental Plating	MIDI.	December 1 - 2, 1988
6.	Reading of Mechanical Drawing	MIDI	December 19 - 23, 1988
7.	Technology of Nodula Casting by Cupola	MIDI	January 10 - 13, 1989
8.	Heat Treatment of Tool Steel	MIDI	January 18 - 20, 1989
9.	Pneumatic in LCA System	Chieng Mai	January 17 - 19, 1989
10.	Basic Principle of Hydralic system	MIDI	January 26 - 27, 1989
11.	Electro-plating Technology	MIDI	January 23 - 25, 1989
12.	Ornamental Centifugal casting	Nakornsri-Thamaraj	January 23 - 27, 1989
13.	Chromium Plating, Gold Plating	Kalasin.	February 15 - 16, 1989
14.	Design and Manufacturer of Pattern for casting	MIDI	February 20 - 24, 1989
15.	TIG Welding	Chieng Mai	February 20 - 24, 1989
16.	TIG & MIG Welding (Practical)	MIDI	March 3 - 10, 1989
17.	SEMINAR : PROGRAME ON PRESS DIE TECHNOLOGY FOR AUTO PART (AOTS)	MIDI	March 6 - 10, 1989
18.	Quality Control by mean of Testing	MIDI	March 9 - 10, 1989
19.	Technology of Nodula Casting by Induction Furnace (Practical)	MIDI	March 14 - 15, 1989
20.	"Martempering" (Practical)	MIDI	March 21 - 24, 1989
21	Pneumatic in LCA System	MIDI	March 22 - 24, 1989
22.	Chromium Plating, Gold Plating	Phuket	March 27 - 30, 1989

No.	Name of Courses	Place	Period
23.	Chromium Plating, Gold Plating	Chieng Mai	April 17 - 20, 1989
24.	Basic Metallurgy for Entrepreneur	MIDI	April 18 - 20, 1989
25.	Reading of Mechanical drawing	MIDI	April 24 - 28, 1989
26.	Pneumatic in LCA System	Suratani	April 25 - 27, 1989
27.	TIG & MIG Welding	MIDI	May 2 - 9, 1989
28.	Plating on Plastic ABS	MIDI	May 9 - 10, 1989
29.	Quality Control of moulding sand for casting	MIDI	May 10 - 12, 1989
30.	Heat Treatment of Tool Steel	MIDI	May 15 - 19, 1989
31.	Basic Principle of Hydralic system	MIDI	May 25 - 26, 1989
32.	TIG & MIG Welding	Payao	May 22 - 26, 1989
33.	Heat treatment of Machine tool's parts	Songkhla	June 5 - 9, 1989
34.	Reading of Mechanical Drawing	Khon Kaen	June 5 - 9, 1989
35.	Technique for Maintenance	MIDI	June 16 - 23, 1989
36.	Electo-plating	Pitsanulok	June 19 - 22, 1989
37.	Technique of Precision	MIDI	July 4 - 5, 1989
38.	Basic Metallugy for Entrepreneur	MIDI	July 11 - 13, 1989
39.	Anodizing - Aluminium Signboard	MIDI	July 19 - 20, 1989
40.	Pneumatic in LCA System	MIDI	July 26 - 28, 1989
41.	Heat Treatment of steel (Practical)	MIDI	August 1 - 25, 1989
42.	High Chromium Steel Manufacturing Technology	MIDI	August 7 - 8, 1989
43.	Practical of TIG & MIG Welding	MIDI	August 14 - 22, 1989
44.	Pneumatic in LCA System	MIDI	August 14 - 25, 1989
45.	Reading of Mechanical drawing	MIDI	August 21 - 25, 1989
46.	Basic Metallurgy for Entrepreneur	MIDI	September 5 - 7, 1989
47.	Technology of Nodula Casting by Cupola	MIDI	September 11 - 14, 1989
48.	Basic principle of hydralic system	MIDI	September 21 - 22, 1989
49.	Pneumatic in LCA System	Khon kaen	September 26 - 28, 1989

資料6　MIDIプロジェクトに関するタイ側運営予算
（タイ側作成資料）

ＭＩＤＩ実行予算推移

NOVEMBER, 1988

単位＝バーツ　１バーツ＝約５円

THAI FISCAL YEAR / CATEGORY	1987	1988	1989
PERSONNEL EXPENSES	—	3,584,000	3,960,000
EXPENSES AND RENUMERATION	1,625,700	2,000,000	2,368,000
PUBLIC UTILITIES	—	396,000	1,162,000
EQUIPMENT	—	412,200	49,400
TOTAL	1,625,700	6,392,200	7,539,400

（注）タイ会計年度は10月1日から翌年9月30日まで

＜例＞　1988タイ会計年度：1987年10月1日から1988年9月30日まで

Detailed Budget Allocation for the Fiscal yeal 1988

MIDI Project				6,392,200	Baht
1. Salaries and Permanent Wages				3,584,000	Baht
1.1 Salaries				2,702,000	Baht
Formal	42 positions			2,525,000	Baht
New	8 positions (9 months)			177,000	Baht
	Detailed new positions				
	Level 3	2,765 Baht	1 position		
	Level 2	2,485 Baht	6 positions		
	Level 1	1,950 Baht	1 position		
1.2 Permanent Wages				882,000	Baht
Formal	17 positions			757,000	Baht
New	4 positions (9 months)			76,000	Baht
Adding Wages				49,000	Baht
	Detailed new positions				
	Wages	2,485 Baht	1 position		
	Wages	1,950 Baht	3 positions		
2. Remuneration Money, Special Expenses and Material Expenses				2,000,000	Baht
2.1 Remuneration Money				10,000	Baht
2.1.1 Service Charge for outsided lecturers				10,000	Baht
2.2 Special Expenses				581,000	Baht
2.2.1 Subsidies, Rome Rental and Travel Allowances				200,000	Baht
2.2.2 Storage Charge and Port Clearance				200,000	Baht
2.2.3 Bank Commission				80,000	Baht
2.2.4 Material Repairing Charges and Transportation Expenses				80,000	Baht
2.2.5 Vehicle Repairing Charges and Transportation Expenses				21,000	Baht
2.3 Material Expenses					
2.3.1 Expenses for Equipments				600,000	Baht
2.3.2 Expenses for Constructional and Experimental Materials				350,000	Baht
2.3.3 Expenses for Scientific Materials				266,000	Baht
2.3.4 Expenses for Office Stationery				200,000	Baht
2.3.5 Expenses for Gasoline Fees				100,000	Baht
2.3.6 Expenses for Textbooks				80,000	Baht
2.3.7 Expenses for Household Materials				50,000	Baht
2.3.8 Expenses for Electrical Materials				30,000	Baht
2.3.9 Expenses for Vehicle and Transportation Materials				15,000	Baht

3. Public Utilities			396,000	Baht
3.1 Charges for Electricity			300,000	Baht
3.2 Charges for Tap-Water			33,000	Baht
3.3 Charges for Telephone			63,000	Baht
4. Expenses for Heavy Materials, Lands and Some Parts of Building			412,200	Baht
4.1 Expenses for Heavy Materials			127,800	Baht
4.1.1 Office Use			59,800	Baht
(1) Tables and Chairs Level 1-2	7 sets		8,400	Baht
(2) Tables and Chairs Level 3-6	1 set		1,900	Baht
(3) Typewriter (Thai Letter - 24 inches long)			11,000	Baht
(4) Typewriter (English Letter - 24 inches long)			11,000	Baht
(5) Cabinet (4 drawers)	8 sets		11,200	Baht
(6) Cabinet (2 shutters)	9 sets		12,600	Baht
(7) Typewriting Tables & Chairs	2 sets		2,400	Baht
(8) Aluminium Stairs (4 legs - 10 feet tall)	1 piece		1,300	Baht
4.1.2 Heavy Materials for Factory			68,000	Baht
(1) Iron Cabinet for Keeping Iron	10 sets		30,000	Baht
(2) Salt Bath (Diameter - 35 cm., Depth - 50 cm .)	1 set		30,000	Baht
(3) Jack (Weight 3 tons)	1 piece		8,000	Baht
4.2 Expenses for Lands and Some Parts of Building			284,400	Baht
4.2.1 Some Parts of Building			284,400	Baht
(1) Concrete Wall (Length 140 metres)			134,400	Baht
(2) Garage	1 garage		150,000	Baht

Detailed Budget Allocation for the Fiscal Year 1989

MIDI Project	7,539,400 Baht		
1. Salaries and Permanent Wages	3,853,000 Baht		
1.1 Salaries	2,897,000 Baht		
Formal 50 positions		2,897,000 Baht	
1.2 Permanent Wages	956,000 Baht	(Permanent-Workers)	
Formal 21 positions		887,000 Baht	
Transfer Temporary Worker 1 position		12,000 Baht	
Adding Wages		57,000 Baht	
Detailed new position (1989)			
Wage 1,255 Baht 1 position			
2. Temporary Wages	107,000 Baht	(Temporary-Workers)	
Financial and Accountancy Wages,			
Trainers, Technicians and Librarian			
3. Remuneration Money, Special Expenses and Material Expenses	2,368,000 Baht		
3.1 Remuneration Money	15,000 Baht		
3.1.1 Service Charges for outsided lecturers		10,000 Baht	
3.1.2 Food Fee for out of working time		5,000 Baht	
3.2 Special Expense	643,000 Baht		
3.2.1 Cleaners Wage		252,000 Baht	
3.2.2 Subsidies, Accom. and Travel Allowance		200,000 Baht	
3.2.3 Storage Charge and Port Clearance		100,000 Baht	
3.2.4 Material Repairing Charges		50,000 Baht	
3.2.5 Vehicle Repairing Charges and Transportation Expenses		21,000 Baht	
3.2.6 Entertainments		20,000 Baht	
3.3 Material Expenses	1,710,000 Baht		
3.3.1 Equipments		600,000 Baht	
3.3.2 Constructional and Experimental		350,000 Baht	
3.3.3 Scientifics		260,000 Baht	
3.3.4 Office Stationeries		200,000 Baht	
3.3.5 Gasoline and Lubricants		100,000 Baht	
3.3.6 Textbooks		100,000 Baht	
3.3.7 Households		50,000 Baht	
3.3.8 Electrical and Radio		30,000 Baht	
3.3.9 Vehicle and Transportation		15,000 Baht	
3.3.10 Materials for Dissemination		5,000 Baht	

4. Public Utility Expenses	1,162,000	Baht	
4.1 Electricity		900,000	Baht
4.2 Tap-Water		150,000	Baht
4.3 Telephone		100,000	Baht
4.4 Postage and Telegrame		12,000	Baht
5. Expenses for Permanent Materials, Land and Parts of Building	49,400	Baht	
5.1 Permanent Materials	49,400	Baht	
5.1.1 Office Permanent	49,400	Baht	
(1) Cabinet (4 drawers)		7,200	Baht
(2) Cabinet (2 shutters)		7,200	Baht
(3) Bookcase (30 drawers)		9,100	Baht
(4) Computer Table (2 sets)		2,800	Baht
(5) Curtain (16 sets)		19,600	Baht
(6) Caculator with print out and monitor 12 digits		3,500	Baht