

JOINT EVALUATION REPORT
ON
THE JAPANESE TECHNICAL COOPERATION
FOR
THE PROJECT ON FOUNDRY TECHNOLOGY UNIT
STANDARDS AND INDUSTRIAL
RESEARCH INSTITUTE OF MALAYSIA (SIRIM)

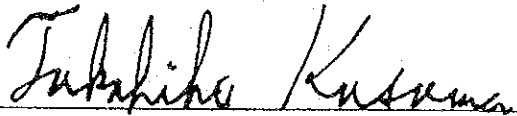
JAPAN INTERNATIONAL COOPERATION AGENCY (JICA)
STANDARDS AND INDUSTRIAL RESEARCH INSTITUTE OF MALAYSIA (SIRIM)

1 JUNE 1993
SHAH ALAM, SELANGOR DARUL EHSAN
MALAYSIA

MUTUALLY ATTESTED AND SUBMITTED
TO ALL CONCERNED

1 JUNE 1993

SHAH ALAM, SELANGOR DARUL EHSAN
MALAYSIA



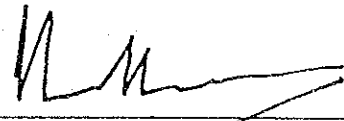
MR. TAKAHIKO KASAMA

Leader

Japanese Evaluation Team

Japan International Cooperation Agency

Japan.



DR. CHONG CHOK NGE

Director of Research and Technology
Development

Standards and Industrial Research
Institute of Malaysia

on behalf of the Secretary General
Ministry of Science, Technology
and the Environment
Malaysia.

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I. INTRODUCTION

1. The Evaluation Teams

The Japanese Evaluation Team (hereinafter referred to as "The Japanese Team") organised by Japan International Cooperation Agency (hereinafter referred to as "JICA"), headed by Mr. Takahiko Kasama, JICA, visited Malaysia from 19 May to 1 June 1993 in order to jointly evaluate with the Malaysian Evaluation Team (hereinafter referred to as "The Malaysian Team") the achievement of the Japanese Technical Cooperation for the Project on Foundry Technology Unit (now known as Foundry Group effective from 1 January 1993) in the Standards and Industrial Research Institute of Malaysia (hereinafter referred to as "The Project") on the basis of the Record of Discussions signed on 12 October 1988 (hereinafter referred to as "The R/D").

The Team discussed and studied together with the Malaysian Team regarding the achievement, impact, sustainability and the future cooperation of the Project.

Through careful studies and discussions, both sides summarized their findings and observations as described in this document.

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2. Schedule of the Japanese Evaluation Team

Date	Schedule
20 May 1993	- Meeting with the Japanese Experts (Consultants)
21 May 1993	- Hearing from the Japanese Experts (Consultants)
22 May 1993	- Meeting with the Malaysian Counterparts (Consultants)
24 May 1993	- Meeting with the Malaysian Counterparts (Consultants)
25 May 1993	A.M. Discussion with the Malaysian Counterparts about feedback from local foundries (Consultants) P.M. Meeting with the Malaysian Evaluation Team about the schedule and methodology (Evaluation Team)
26 May 1993	A.M. Hearing from the Japanese Experts (Evaluation Team) P.M. Hearing from the Malaysian Counterparts (Evaluation Team)
27 May 1993	- Meeting with the Malaysian Evaluation Team (Evaluation Team)
28 May 1993	- Drafting of the Joint Evaluation Report (Joint Evaluation Team)
31 May 1993	- Drafting of the Joint Evaluation Report (Joint Evaluation Team)
1 June 1993	- Joint Committee Meeting - Signing of the Joint Evaluation Report and the Minutes of Discussions

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3. Attendance

3-1 Japanese Side

1) The Japanese Evaluation Team

Mr. Takahiko Kasama	-	Leader
Mr. Koutaro Tanaka	-	Technical Cooperation Planning
Mr. Toshikazu Oshima	-	Foundry Quality Control etc.
Mr. Noriyasu Oe	-	Moulding etc.
Mr. Shigeru Otake	-	Coordinator

2) Japanese Experts

Dr. Hideaki Ohta	-	Chief Advisor
Mr. Hiroshi Kanamori	-	Coordinator
Mr. Katsuhiko Fujihiro	-	Melting
Mr. Akinaga Ohdaira	-	Moulding
Mr. Tsuneto Nonaka	-	Pattern Making

3) JICA Malaysia Office

Mr. Takao Kaibara

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3-2 Malaysian Side

(1) The Malaysian Evaluation Team

Dr. Chong Chok Ngee - Director, Research and Technology
Development Division, SIRIM

Mr. Helme Hashim - Head, Product and Machine
Development Centre, SIRIM

(2) Malaysian Counterparts (SIRIM)

Mr. Muhammad Fauzi Ismail

Mr. Mohd Akhir Yeop Kamaruddin

Miss Lee Lay Kuan

Mr. Azmaizam Hj. Mohd. Zain

Mr. Romzee Ismail

Mr. Rosman Iteng

Mr. Hasnul Akmal Haron

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II. METHODOLOGY OF EVALUATION

1. Evaluators

Malaysian Side : The Malaysian Evaluation Team

Japanese Side : The Japanese Evaluation Team

2. Materials for Evaluation

In order to evaluate the past performance and achievement both quantitatively and qualitatively, the following items were used :

- (1) The Record of Discussions (The R/D).
- (2) The Minutes of Meetings, the Annual Work Plans and other documents agreed on or accepted in the course of implementation of The Project.
- (3) The Feedback from the local foundries.
- (4) The Logical Framework as shown in Annex I.

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III. BACKGROUND AND SUMMARY OF THE PROJECT

1. Brief Background of The Project

The proposed Foundry Technology Centre (hereinafter referred to as "The Centre") to be sited in Ipoh, Perak was approved for implementation in the Fifth Malaysia Plan (1986-1990). Due to the high infrastructural cost of siting The Centre in Ipoh and in view of the budget constraint, SIRIM decided to look for alternatives to implement The Project.

It was necessary for SIRIM to immediately carry out its foundry activities to assist in the development of the local foundry industry, and essential for SIRIM to set up The Centre within the time frame of the Fifth Malaysia Plan. A reduced implementation cost could be achieved by establishing a scaled-down Centre in SIRIM, Shah Alam.

The proposed Centre would be a component of the Metal Industry Development Center (MIDEC) which was formed after the merger of the Metal Industry Technology Centre (MITEC, implemented in 1981) and Metal Industry Research and Development Centre (MIRDC, implemented in 1984). Hence the proposed Centre will be known as the Foundry Technology Unit (FTU).

The scaled-down Centre was proposed so as to cater to the needs of SIRIM to carry out its foundry activities. Approval was given by the Economic Planning Unit (EPU) for the setting up of FTU on condition that it be located within the existing available building in SIRIM Complex in Shah Alam.

2. Chronological Review of The Project

The chronological review of The Project is as shown in Annex 2.

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3. Purpose of The Project

The Project aims at developing human resources for the transfer of technology in the field of foundry technology and, thus, contributing to the technological development of the foundry industry in Malaysia.

4. Tentative Schedule of Implementation

The initial tentative schedule of implementation is as shown in Annex 3.

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IV. RESULTS OF EVALUATION

1. Output from The Project

1-1 Technology Transfer to the Foundry Industry in Malaysia

1-1-1 Status of the Technology Transfer

The present status of The Project can be summarized as follows :

- Schedule of implementation and accomplishment as in Annex 4
- Technical Cooperation Programme as in Annex 5
- Items of Technology Transfer as in Annex 6
- List of Standard Operating Procedures as in Annex 7
- List of Standard Working Procedures as in Annex 8
- List of Data Sheets as in Annex 9

In producing target products, FTU personnel were able to acquire the basic foundry technology from the Japanese experts. It is recognised that they have reached the level to transfer the technology to the foundry industry in Malaysia.

1-1-2 Target Products

As stipulated under ANNEX 1 in The R/D, The Project aims at developing human resources for the transfer of technology in the field of foundry technology and, thus, contributing to the technological development of the foundry industry in Malaysia.

In this respect, having discussed thoroughly in November 1989, the Japanese Consultation Team and the Malaysian Team agreed that technology would be transferred through product development as shown in Annex 6.

The target products were tentatively selected as shown in Annex 10.

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1-2 FTU Activities

The FTU is a technology group under the Product and Machine Development Centre of the Research and Technology Development Division of SIRIM. The SIRIM organisation structure as of 1 January 1993 is as shown in Annex 11.

1-2-1 Advisory Services

A total of 114 foundries and factories (including revisits) were visited during the period since July 1989 to April 1993. The list of local foundries visited is as shown in Annex 12.

1-2-2 Information Services

The list of information services is as shown in Annex 13.

1-2-3 Test and Inspection Services

A total of 575 cases of Test and Inspection were carried out as shown in Annex 14.

1-2-4 Seminars

A total of 23 seminars were held during the period with participants from private companies and governmental organizations. The seminars organised are as shown in Annex 15.

1-2-5 Research and Development

Although R&D projects are beyond the scope of The Project, the Malaysian Team requested for assistance and guidance from the Japanese Experts in carrying out the R&D projects. The Japanese Experts agreed to cooperate. The products developed are as shown in Annex 16.

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1-3 Meetings for The Project

Regular and scheduled meetings were held to monitor and assess the progress of The Project as shown in Annex 17.

2. Input to The Project

2-1 Schedule of Implementation and Accomplishment

The Project accomplishment based on the schedule of implementation is as shown in Annex 4.

2-2 Input by the Japanese Side

2-2-1 Dispatch of Japanese Experts and Survey Teams

JICA has dispatched eight (8) long-term experts and thirty-seven (37) short-term experts, and also, sent seven (7) survey teams in relation with The Project as shown in Annex 18 and 19, respectively.

2-2-2 Acceptance of the Malaysian Counterpart Personnel for Training in Japan

JICA has accepted twenty-two (22) Malaysian counterpart personnel for training in Japan as shown in Annex 20.

2-2-3 Provision of Machinery and Equipment

Up to now, the machinery, equipment and materials equivalent to ¥ 385,995,000 have been provided by the Japanese Government through JICA as shown in Annex 21.

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2-2-4 Expenses by the Japanese Side

The total outlay of The Project by the Japanese side was ¥ 764,237,000 as shown in Annex 22.

2-3 Input by the Malaysian Side

2-3-1 Allocation of Malaysian Counterpart and Administrative Personnel

To date the Malaysian side has allocated the personnel as shown in Annex 23 and 24, respectively.

2-3-2 Provision of Infrastructure

The provision of infrastructure by the Malaysian side is as shown in Annex 25.

2-3-3 Purchase of Machinery and Equipment

The machinery and equipment with the total cost of RM 784,520 have been purchased by the Malaysian side as shown in Annex 26.

2-3-4 Expenses by the Malaysian Side

The total outlay of The Project by the Malaysian side was RM 3,844,949.53 as shown in Annex 27.

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3. Impact of the Project

3-1 Contents of Impact

After interviewing local foundries, the following results were acquired :

- (1) FTU contributes to local foundries through services such as Test and Inspection Services, Technical Advisory Services, Seminars, and Product Development Services.
- (2) To promote cooperation with local foundries, FTU has implemented and is implementing the following : support for vocational skill examination programme under the Ministry of Human Resources, Malaysia (MLVK - National Vocational Training Council), Casting Contest organised by FOMFEIA and JETRO, and holding of Casting Clinics.
- (3) Requests to FTU ;
 - Holding seminars to disseminate new technology and information
 - Further technical instruction about resin pattern making
 - Giving comments (technical instruction) to Test and Inspection Services and continuing to give specific advice
 - Revise the rate of charges for test and inspection services and other consultancy services

As a result of the implementation of The Project, there is great expectation from the foundry industry for FTU to play a major role in providing technical consultancy services in the future.

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3-2 Diffusion of Impact and the Range of Beneficiaries

- (1) It is obvious that FTU can contribute to the development of the foundry industry through implementing FTU's activities with stronger cooperation with the industry.
- (2) SIRIM has benefitted from the outcome of The Project as it has developed a structured and organised work approach for the FTU personnel.

4. The Prospect of Sustainability

4-1 The Prospect of Sustainability from the Organisational Aspect

- (1) The FTU is firmly positioned in the SIRIM's organisation structure and will have enough resources and capability to sustain the future programmes.
- (2) It is considered that FTU has the required staff to manage and implement the FTU programmes.
- (3) As the organisation has been restructured in January 1993, FTU is in a better position to strengthen cooperation and implement its activities with the foundry industry.

4-2 The Prospect of Sustainability from the Financial Aspect

- (1) As the FTU is a formal entity in the organisation structure of SIRIM, it will continue to be supported and sustained after the period of cooperation.
- (2) From 1995 SIRIM will be a corporatised institution and has plan to increase its revenue through undertaking contract research activities with industry. It is likely that a part of the cost to manage FTU will be financed through these contract research activities.

4-3 The Prospect of Sustainability from the Human Resource and Technical Aspect

- (1) Appropriate Japanese Experts were dispatched to transfer the necessary technology and this contributed to FTU's sustainability to enable it to be administered adequately.
- (2) FTU has enough qualified technical staff.
- (3) It is considered that staff who have undergone technology transfer programmes can instruct their colleagues and subordinates by using standard working procedures, standard operating procedures, data sheets, textbooks, and seminar materials.

4-4 Other Restrictions on Administration

- (1) It is desirable for staff who have undergone the technology transfer programmes to be retained within FTU.
- (2) It is important for FTU to cooperate with local foundries to develop technology and products.

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V. EVALUATION

1. Technology Transfer

The evaluation was made based on the Technical Cooperation Programme and the Items of Transferred Technology as shown in Annex 5 and Annex 6, respectively.

(1) Evaluation in Basic Training

In general, most of the items agreed upon in The R/D have been executed.

(2) Evaluation in Foundry Technology

In general, most of the target products as stipulated in The R/D have been accomplished.

2. Training Programme of the Malaysian Counterpart Personnel in Japan

The training programme of the Malaysian Counterpart personnel in Japan covered all areas as stipulated in The R/D. Most of them expressed their satisfaction of the training programme prepared by JICA.

3. Storage, Maintenance and Operation of Machinery and Equipment

The machinery, equipment and facilities provided by JICA to date have been put to practical use and well maintained as shown in Annex 21.

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VI CONCLUSION

As a result of the Joint Evaluation work and discussions, both Teams reached the following conclusions :

- (1) In general, most activities of The Project in The R/D are coming to the final stage of implementation.
- (2) The successful implementation of The Project is due largely to the effective and sincere cooperation between the Japanese authorities and experts, and the Malaysian authorities and counterpart personnel, who have overcome most of the difficulties in the course of implementing The Project.
- (3) It is considered that the Malaysian counterpart personnel will be able to carry out advisory services, information services, test and inspection services and seminars by themselves.
- (4) In conclusion, both Teams agreed that the technology transfer would be completed as planned in The R/D and The Project should be terminated on 11 October 1993 as scheduled in The R/D.

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VII. RECOMMENDATIONS

Based on the mutual basic understanding that the continuation of the development of the foundry industry is necessary as a long term programme for the progress of Malaysia and, at the same time, the self-reliance of FTU is very important to sustain the capabilities fostered from the results of The Project, both Teams agreed to recommend the following ;

- (1) That the Malaysian side takes measure to fully utilise all the FTU facilities within its foundry and testing laboratories, and to develop institutional relations with institutes and industries, to develop processes and products, and to generate income.

- (2) That the Japanese side takes measures to facilitate any possible governmental and non-governmental cooperation to enhance the progress of the FTU after the termination of The Project.

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LOGICAL FRAMEWORK

Technical Cooperation for the Project on Foundry Technology Unit In the Standards and Industrial Research Institute of Malaysia.

Summary of Project	Verifiable Indicators	Evaluation Result	Pre-conditions (Important assumptions)
<p><u>Objective of project (Indirect Impact)</u></p> <ul style="list-style-type: none"> Development of the local foundry industry in Malaysia. Foundry technology improvement of the local foundries in Malaysia. 	<p><u>Attainment of project purpose</u></p> <ul style="list-style-type: none"> The degree of FTU's contribution to the local industry interview. 	<ul style="list-style-type: none"> FTU has contributed to improvement on foundry technology in the local industry. FTU has been implementing Technical Authorisation Program, Contest of Casting and setting up study groups 	<ul style="list-style-type: none"> FTU has been established in support of policies to develop manufacturing industries based on Industrial Master Plan and New Economic Policies of the Government of Malaysia.
<p><u>Purpose of project (direct impact)</u></p> <ul style="list-style-type: none"> The establishment of technical support system for the local foundry industry by FTU. 	<p>Inquiry about FTU activities</p> <ol style="list-style-type: none"> Advisory service Information service Test and inspection service Seminar Research and development product 	<p>Oct. 1988 - Nov. 1993, total</p> <ol style="list-style-type: none"> Advisory services : 114 cases Information services : 19 cases Test and inspection services : 575 requests Seminars : 14 seminars and 9 groups trained Research and development products : 16 products 	<ul style="list-style-type: none"> Positioning FTU into the organisation chart of SIRIM. Making C/Ps remain in FTU Obtaining administrative costs.
<p><u>Output from project</u></p> <ul style="list-style-type: none"> Transferring required foundry technology to C/Ps to implement services of FTU. 	<ol style="list-style-type: none"> Transfer technology to each planned field Manufacturing of the target products 	<ol style="list-style-type: none"> The technology transfer almost completed as planned in the R&D All of the target products as scheduled in the R&D have been accomplished. 	<ul style="list-style-type: none"> Filing of job standard manuals and other materials Instruction of colleagues and subordinates.
<p><u>Activities</u></p> <ul style="list-style-type: none"> Basic training about the items agreed upon in the R/D. Practical technology based on manufacturing of target products agreed upon in the R/D. Training about important points by short-term experts. Support for vocational skill examination programme under the Ministry of Human Resources, Malaysia Organise Casting clinics Support for Casting Contest 	<p><u>Inputs by the Japanese side</u></p> <ol style="list-style-type: none"> Dispatch of the Japanese experts: 8 long-term experts, 37 short-term experts Acceptance of the Malaysian counterpart personnel in Japan : 22 persons Provision of the machinery and equipment: high frequency induction melting furnace, equipment for sand preparation, equipment for sand test, x-ray fluorescence analyzer Expenses: ¥ 764,237,000 (Oct 1988 - Oct 1993) <p><u>Inputs by the Malaysian side</u></p> <ol style="list-style-type: none"> Allocation of the Malaysian counterpart & administrative personnel: 24 persons Expenses: RM 3,844,949.53 Construction for the buildings: Construction building finished in Jun 1993. Purchase of the machinery and equipment: equivalent to RM 784,520 		

CHRONOLOGICAL REVIEW OF THE PROJECT

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Year	Month	Item
1986	Jul.	The Government of Malaysia requested to the Government of Japan for technical cooperation.
1987	Sep.	Dispatch of the Preliminary Survey Team by JICA
1988	Apr. Oct.	Dispatch of the Expert Survey Team Dispatch of the Implementation Survey Team
1989	Feb. Mar. Mar. Mar. May. Jun. Nov. Nov.	Training of the Malaysian Counterpart Personnel in Japan (1 person; project management) Dispatch of the long-term experts (2 persons; coordinator and melting) Dispatch of the Expert Survey Team Training of the Malaysian Counterpart Personnel in Japan (4 persons; pattern making, melting, moulding and draughting) Dispatch of the long-term expert (Chief Advisor) Dispatch of the long-term expert (1 person; moulding) Dispatch of the Consultation Team
1990	Jan. Feb. May May Sep. Oct. Nov.	Dispatch of the short-term experts (2 persons; melting and installation of equipment) Dispatch of short-term experts (3 persons; installation of equipment, 1 person; pattern making, 1 person; moulding) Dispatch of Expert Survey Team Training of the Malaysian Counterpart Personnel in Japan (4 persons; pattern making, moulding melting, test and inspection) Dispatch of the short-term experts (2 persons; quality control, test and inspection) Dispatch of the long-term expert (1 person; pattern making) Dispatch of the Technical Guidance Team (1 person; seminar on foundry technology)

1991	Mar. May.	Dispatch of the long-term expert (1 person; melting) Training of the Malaysian Counterpart Personnel in Japan (3 persons; pattern making, melting, test and inspection)
	Jun. Aug.	Dispatch of long-term expert (Chief Advisor) Dispatch of the short-term expert (1 person; casting design)
	Sep.	Training of the Malaysian Counterpart Personnel in Japan (1 person; product development)
	Sep.	Dispatch of the short-term expert (1 person; test and inspection)
	Oct. Nov.	Dispatch of the long-term expert (1 person; moulding) Dispatch of the short-term expert (1 person; seminar on foundry technology)
	Nov.	Training of the Malaysian Counterpart Personnel in Japan (3 persons; moulding, finishing and quality control)
1992	Feb.	Dispatch of the short-term expert (1 person; quality control)
	Feb. May	Dispatch of the Technical Guidance Team Dispatch of the short-term expert (1 person; X-Ray Fluorescence Analyzer)
	May	Training of the Malaysian Counterpart Personnel in Japan (3 persons; pattern making, moulding and quality control)
	Sep.	Dispatch of the short-term experts (3 persons; aluminium alloy casting, casting drawing and resin pattern making)
	Dec.	Dispatch of the Consultation Team
1993	Jan	Dispatch of the short-term experts (2 persons; resin sand moulding and copper alloy casting)
	May	Training of the Malaysian Counterpart Personnel in Japan (3 persons; moulding, test and inspection and draughting)
	May	Dispatch of the Evaluation Team

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TENTATIVE SCHEDULE OF IMPLEMENTATION

Term of The Project	Phase I												Phase II																																
	1987			1988			1989			1990			1991			1992			1993																										
	U	III	IV	I	II	III	IV	I	II	III	IV	I	II	III	IV	I	II	III	IV	I	II	III																							
<p>Malaysian Side</p> <p>I. Staff Recruitment</p> <p>II. Reconstruction of the Workshop</p> <p>1) Preparation</p> <p>2) Building Construction</p> <p>3) Foundation Construction</p> <p>III. Provision of Equipment</p> <p>Japanese Side</p> <p>I. Dispatch of Survey Team</p> <p>1) Preliminary Survey Team</p> <p>2) Experts Survey Team</p> <p>3) Implementation Survey Team</p> <p>4) Consultation Team</p> <p>5) Technical Guidance Team</p> <p>6) Technical Guidance Team</p> <p>7) Consultation Team</p> <p>8) Evaluation Team</p> <p>II. Long Term Experts</p> <p>1) Chief Advisor</p> <p>2) Coordinator</p> <p>3) Pattern Making</p> <p>4) Moulding</p> <p>5) Melting</p> <p>III. Short Term Experts</p> <p>1) Pattern Making</p> <p>2) Product Development</p> <p>3) Moulding</p> <p>4) Melting</p> <p>5) Quality Control</p> <p>6) Test and Inspection</p> <p>7) Finishing</p> <p>8) Installation and Operation</p> <p>IV. Training of C/Ps Personnel in Japan</p> <p>1) Pattern Making</p> <p>2) Product Development</p> <p>3) Moulding</p> <p>4) Melting</p> <p>5) Quality Control</p> <p>6) Test and Inspection</p> <p>7) Finishing</p> <p>V. Provision of Equipment</p>																																													

[Remarks] ○○○ ; Schedule

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SCHEDULE OF IMPLEMENTATION AND ACCOMPLISHMENT (1/3)

Annex 4

Phase	Phase I												Phase II											
	1987			1988			1989			1990			1991			1992			1993					
	II	III	IV	I	II	III	IV	I	II	III	IV	I	II	III	IV	I	II	III	IV	I	II	III		
Term of The Project	R/D																							
Malaysian Side	-----																							
1. Staff Recruitment	-----																							
1) Project Management	-----																							
2) Product Development	-----																							
3) Pattern Making	-----																							
4) Melting	-----																							
5) Moulding	-----																							
6) Test & Inspection	-----																							
7) Finishing	-----																							
8) Quality Control	-----																							
9) Stonographer	-----																							
10) Storekeeper	-----																							
11) Driver	-----																							
2. Construction of the workshop	-----																							
1) Preparation	-----																							
2) Building Construction	-----																							
3) Foundation Construction	-----																							
3. Provision of Equipment	-----																							

[Remark] ----- : Schedule, ----- : Accomplishment.

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SCHEDULE OF IMPLEMENTATION AND ACCOMPLISHMENT (2/3)

Annex 4

Phase	Phase I												Phase II											
	1987			1988			1989			1990			1991			1992			1993					
	II	III	IV	I	II	III	IV	I	II	III	IV	I	II	III	IV	I	II	III						
Calendar Year	1987			1988			1989			1990			1991			1992			1993					
Fiscal Year	II	III	IV	I	II	III	IV	I	II	III	IV	I	II	III	IV	I	II	III						
Term of The Project	R/D																							
Japanese Side	<p>1. Dispatch of Survey Teams</p> <p>1) Preliminary Survey Team</p> <p>2) Implementation Survey Team</p> <p>3) Consultation Team</p> <p>4) Technical Guidance Team</p> <p>5) Evaluation Team</p> <p>2. Long-Term Experts</p> <p>1) Chief Advisor</p> <p>2) Coordinator</p> <p>3) Pattern Making</p> <p>4) Moulding</p> <p>5) Melting</p> <p>3. Short-Term Experts</p> <p>1) Experts Survey Team</p> <p>2) Pattern Making</p> <p>3) Product Development</p> <p>4) Moulding</p> <p>5) Melting</p> <p>6) Quality Control</p> <p>7) Test & Inspection</p> <p>8) Finishing</p>																							

[Remark] : Schedule, : Accomplishment

MNC

SCHEDULE OF IMPLEMENTATION AND ACCOMPLISHMENT (3/3)

Phase	Phase I												Phase II							
	1987			1988			1989			1990			1991			1992			1993	
	II	III	IV	I	II	III	IV	I	II	III	IV	I	II	III	IV	I	II	III	IV	
Calendar Year	1987			1988			1989			1990			1991			1992			1993	
Fiscal Year	II	III	IV	I	II	III	IV	I	II	III	IV	I	II	III	IV	I	II	III	IV	
Term of The Project	R/D																			
Japanese Side	<p>8) Installation & Operation X-Ray Fluorescent Analyzer Moulding Machine Ins. Sand Preparation Sand Dryer Moulding Machine Ope. Induction Furnace Additional Fields Casting Design Aluminium Drawing Copper Alloy Resin Sand Mould Steel Casting Technology (Seminar)</p> <p>4. Training of C/P Personnel in Japan 1) Project Management 2) Pattern Making 3) Product Development 4) Moulding 5) Melting 6) Quality Control 7) Test & Inspection 8) Finishing 9) Drawing 10) Foundry Technology</p> <p>5. Provision of Equipment</p>																			

[Remark] : Schedule, --- : Accomplishment.

MVC

TECHNICAL COOPERATION PROGRAMME (1/2)

Phase	Phase I												Phase II											
	1987			1988			1989			1990			1991			1992			1993					
	II	III	IV	I	II	III	IV	I	II	III	IV	I	II	III	IV	I	II	III						
Calendar Year	1987			1988			1989			1990			1991			1992			1993					
Fiscal Year	1987			1988			1989			1990			1991			1992			1993					
Term of The Project				R/D																				
1. Preparation of Textbook																								
2. Lecture																								
3. Basic Technology																								
4. Practical Technology (target products)																								
① Brake Drum																								
② Pulley																								
③ Gear																								
④ Hub																								
⑤ Motor Cover																								
⑥ Disk Brake																								
⑦ Bracket																								
⑧ Pipe Fitting																								
⑨ Screw Press																								
⑩ Cooking Base																								
⑪ Copper Valve																								
⑫ Air Condition Bracket																								
⑬ Stainless Steel Valve																								
⑭ Impeller (pattern making only)																								
5. FTU R&D Projects (Detail is shown in the next page)																								
6. Advisory Service																								
7. Test & Inspection																								
8. Information Service																								
9. Seminar and Training Courses (Seminar) (Training)																								

[Remarks | --- : Schedule, --- : Revised Annual Work Plan, --- : Accomplishment

MVC

TECHNICAL COOPERATION PROGRAMME (2/2)

Annex 5

Phase	Phase I												Phase II											
	1987			1988			1989			1990			1991			1992			1993					
	II	III	IV	I	II	III	IV	I	II	III	IV	I	II	III	IV	I	II	III						
	R/D																							
Term of the Project	Detail of FTU R&D Projects																							
	1) Product Development																							
	① Plate (souvenir)																							
	② Ingot Case																							
	③ Aluminium Pattern Plate																							
	④ Test Pieces																							
	⑤ Kick Starter-Y80																							
	⑥ Kick Starter-Y100																							
	⑦ Lamp Post																							
	⑧ Tool Rest																							
	⑨ TV Support Bracket																							
	⑩ Track Roller-Single Flange																							
	⑪ Indian Screw Press (casting design only)																							
	⑫ Cooling Tower Propeller Holder																							
	⑬ Fire Hydrant																							
	⑭ Pelletizer																							
	○ Track Roller-Double Flange																							
	○ Casting Contest Wooden Patterns																							
	2) Investigation of Local Wood																							
	3) Investigation of Local Scrap																							
	4) Investigation of Local Sand																							
	5) Development of Moulding Process																							

[Remarks] : Schedule : Accomplishment

M/L

ITEMS OF TECHNOLOGY TRANSFER

TARGET PRODUCT	PATTERN MAKING	MOULDING	MELTING	FINISHING
by ① Brake drum ② Pulley ③ Gear ④ Hub ⑤ Motor cover ⑥ Disk brake ⑦ Bracket ⑧ Pipe fitting ⑨ Screw press ⑩ Cooking base ⑪ Copper Valve ⑫ Bracket ⑬ Stainless Steel Valve ⑭ Impeller	<p>1. Pattern Material</p> <ol style="list-style-type: none"> 1) Wood 2) Synthetic Resin 3) Metal 4) Gypsum <p>2. Additional Material</p> <ol style="list-style-type: none"> 1) Putty 2) Adhesive 3) Paint <p>3. Pattern Making Practice</p> <ol style="list-style-type: none"> 1) Wood Pattern 2) Resin Pattern 3) Metallic Pattern 4) Gypsum Pattern <p>4. Core Box Making Practice</p> <p>5. Inspection for Pattern and Core Box</p> <p>6. Whetting Method of Cutting tool</p> <p>7. Whetting on Stone</p> <p>8. Whetting on Machine</p> <p>9. Tool Usage</p> <p>10. Cutting Tool</p> <p>11. Measurement Tool</p>	<p>1. Moulding Material</p> <ol style="list-style-type: none"> 1) Sand 2) Binder 3) Additive <p>2. Treatment of Wet Sand</p> <p>3. Preparation of Green Sand</p> <ol style="list-style-type: none"> 1) Constitution of Green Sand 2) Mixing of Green Sand 3) Properties of Green Sand 4) Test Method of Green Sand <p>4. Hand Moulding with Green Sand</p> <p>5. Machine Moulding with Green sand</p> <ol style="list-style-type: none"> 1) Moulding by Jolt Machine 2) Moulding by Squeeze Machine 3) Moulding by High Pressure Machine 4) Moulding by Blow Squeeze Machine 5) Moulding by Sand Slinger <p>6. Core Making</p> <ol style="list-style-type: none"> 1) Hand Core Making 2) Machine Core Making <p>7. Moulding Using Cement Sand</p> <p>8. Moulding Using Water Glass Sand</p> <ol style="list-style-type: none"> 1) Self Hardening Process 2) CO₂ process 3) VNF Process <p>9. Moulding Using Resin Sand</p> <ol style="list-style-type: none"> 1) Furn 2) Phenol Urethane (Epoxy Set) 3) Alkali Phenol (Alpha Set) 4) Iso-cure (Cold Box) <p>10. Shell Mould Process</p> <p>11. Full Mould Process</p> <p>12. V Process</p> <p>13. Mould Wash</p> <p>14. Role and Using Method of Accessory Materials</p> <ol style="list-style-type: none"> 1) Chaperlet 2) Core Grid Ridding 3) Strainer Core 4) Chiller 5) Exothermic Sleeve 6) Gas Venting Aids 7) Moulding Flask 8) Weight and Clamp 9) Internal Chiller 	<p>1. Casting Material</p> <ol style="list-style-type: none"> 1) Cast Iron (Ductile, Grey, Malleable etc.) 2) Cast Steel 3) Aluminum Alloy <p>2. Melting of Cast Iron</p> <ol style="list-style-type: none"> 1) Induction Furnace Melting 2) Cupola Melting 3) Oil Furnace Melting <p>3. Melting of Cast Steel</p> <ol style="list-style-type: none"> 1) Induction Furnace Melting 2) Arc Furnace Melting 3) Oil Furnace Melting 4) Holding of Aluminum Alloy <p>4. Induction Furnace Melting</p> <ol style="list-style-type: none"> 1) Induction Furnace Melting 2) Melting of Copper Alloy <p>5. Melting of Copper Alloy</p> <ol style="list-style-type: none"> 1) Induction Furnace Melting 2) Oil Furnace Melting <p>6. Furnace Front Test of Cast Metal</p> <ol style="list-style-type: none"> 1) Cast Iron 2) Cast Steel 3) Aluminum Alloy 4) Copper Alloy <p>7. Manufacturing Procedure of Cast Iron</p> <ol style="list-style-type: none"> 1) Ductile Cast Iron 2) Grey Cast Iron 3) Austempering Ductile Iron 4) Malleable Cast Iron <p>8. Manufacturing Procedure of Cast Steel</p> <ol style="list-style-type: none"> 1) Carbon Steel 2) Stainless Steel <p>9. Alloy</p> <p>10. Manufacturing Procedure of Light Alloy</p> <p>11. Pouring of Cast Iron</p> <ol style="list-style-type: none"> 1) Pouring Ladle 2) Precaution for Pouring Procedure 3) Automatic Pouring Procedure <p>12. Pouring of Cast Steel</p> <p>13. Pouring of Aluminum Alloy</p> <p>14. Pouring of Copper Alloy</p>	<p>1. Shake Out</p> <p>2. Removal of Sprue, Runner and Riser</p> <ol style="list-style-type: none"> 1) Knocking-off 2) Machine Cutting 3) Gas and Electric Cutting <p>3. Cleaning of Castings</p> <p>4. Repairing for Castings</p> <ol style="list-style-type: none"> 1) Heat Treatment 2) Heat Treatment of Iron Casting 3) Heat Treatment of Steel Casting 4) Heat Treatment of Aluminum Alloy Casting <p>5. Heat Treatment of Copper Alloy Casting</p>
	<p>CASTING DESIGN</p> <ol style="list-style-type: none"> 1. Gating System of Cast Iron 1) Pattern 2) Mould 3) Casting Material <p>2. Design of Pattern and Core Box</p> <ol style="list-style-type: none"> 1. Determination of Moulding and Machining Allowance 2. Determination of Gate, Drag and Parting Plan. (Split Plane) 3. Determination of Shrinkage Rule 4. Setting of Chiller, Gas Vent etc. <p>3. Gating System of Cast Steel</p> <p>4. Gating System of Light Alloy</p> <p>5. Gating System of Copper Alloy</p> <p>6. Product Development</p>			
	<p>QUALITY CONTROL</p> <ol style="list-style-type: none"> 1. Method of Quality Control 2. Defects and Its Causes of Target Products 3. Defects and Its Causes of R&D Products 			

1) : only lecture 2) * : Not accomplished as of end of May 1993

MVC

LIST OF STANDARD OPERATING PROCEDURES

1. Pattern Making Section

No.	Title
1	Band Saw
2	Hand Feed Planer
3	Automatic Thickness Planner
4	Boring Machine
5	Router
6	Circular Saw
7	Sharpener and Grinder
8	Knife Grinder
9	Wood Lathe

2. Moulding section

No.	Title
1	Simpson Type Muller
2	Jolt Squeeze Moulding Machine
3	Shake Out Machine
4	Whirl Mix
5	Core Blowing Machine
6	Shell Core Machine
7	Sand Dryer

3. Melting Section

No.	Title
1	High Frequency Induction Furnace
2	Emergency Power Unit
3	Engine Pump
4	Pre-Heater
5	Weighing Scale
6	Immersion Pyrometer
7	Portable Pyrometer
8	Dust Collector
9	Temperature Recorder
10	Temperature Regulator

(3)

WNL

LIST OF STANDARD WORKING PROCEDURES

1. Pattern Making Section

No.	Title
1	Screw Press
2	Pipe Fitting
3	2 Inch Copper Alloy Valve and Stainless Steel valve
4	Air-Condition Bracket
5	Motor Cover
6	Brake Drum
7	Impeller
8	General Manual for Pattern Making
9	Disk Brake
10	Fire Hydrant
11	Bracket
12	Hub
13	Cooking Base
14	Gear and Pulley

2. Moulding section

No.	Title
1	Green Sand Moulding with Jolt Squeeze Machine
2	Green Sand Moulding with Open Type Flask
3	Green Sand Moulding with Air Rammer
4	Green Sand Moulding Using Single Pattern with Follow Board
5	Sand Test Procedures
6	CO ₂ Moulding with Jolt Squeeze Machine
7	CO ₂ Core Making by Manual
8	CO ₂ Moulding with Big Open Type Flask
9	Cement/Self-Set Moulding by Manual
10	Cement/Self-Set Core Making by Manual
11	Cement/Self-Set Moulding with Big Open Type Flask
12	Strength Test by T.P of Cement/Self-Set Mould
13	Moulding Using Loose Piece Pattern
14	Moulding Using Spin Stripping Pattern
15	Core Making on 2 Blowing Gates with Core Blowing Machine
16	Vertical Moulding by Manual
17	Usage of Core Grid

3. Melting Section

No.	Title
1	Grey Cast Iron Melting
2	Ductile Cast Iron Melting
3	Malleable Cast Iron Melting
4	Steel Casting Melting
5	Aluminium Alloy Melting
6	Copper Alloy Melting

(3)

MNL

LIST OF DATA SHEETS (1/3)

1. Moulding Section

No.	Title
1	Appropriate range of green sand properties in respective moulding machine
2	Formulation and usage of green sand mould
3	Pressure of the molten metal in the mould
4	Classification of the sand mould which uses water glass as binder
5	Characteristics of water glass
6	Mould or core coating
7	Cement mould
8	Strainer core
9	Countermeasure for mould drop during moulding
10	Moulding technique & countermeasure of defects in CO ₂ mould
11	Casting quality of aluminium pattern plate
12	Differences of compressive strength between the value measured with US type and measured with GF type
13	Mould tester for green sand
14	Active clay content
15	Properties of green sand mixed with new sand
16	Specification of bentonite
17	Analysis data of dust collected by dust collector in green sand preparation plant
18	Results of the gas content of green sand
19	Silica sand properties
20	Analysis data of local resin coated sand
21	Main point of pouring work
22	Comparison between high and low frequency induction furnace
23	Aluminium alloy casting in sand mould
24	Casting design
25	Application of MINI/HICASS system
26	Drawing system in FTU(Proposal)
27	Cutting condition for band saw machine(Type VM-1200)
28	Calculating procedure of regression line by method of least squares
29	5 S
30	Green sand moulding & sand analysis work sheet
31	CO ₂ sand moulding work sheet
32	Furan moulding work sheet
33	Sand analysis data
34	Working & maintenance record(Green sand preparation)
35	Standard operational procedure for Sand dryer
36	Alkali Phenol Process(α -set)
37	Phenol Urethane Process(Pep-set)
38	Furan Process
39	Iso Cure Process(Cold Box)

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MVC

LIST OF DATA SHEETS (2/3)

2. Melting Section

No.	Title
1	Calculation for charge mix
2	Ladle lining
3	Metal mould for sample of XRF
4	Test lug for casting
5	Castable refractory materials
6	Calibration of "YAMATO" 500Kg scale
7	Performance test of 100Kg high frequency furnace
8	Result of test for carburiser
9	Metallurgy of whiteheart malleable iron
10	Inoculation 1
11	Inoculation 2
12	Planning of experiment
13	Oxidation by mill scale
14	The change of chill depth & mottling tendency by inoculation
15	Result of test for carburiser--2
16	Annealing of souvenir
17	Structure of cast iron--1
18	Structure of cast iron--2
19	Classification of cast iron
20	Comparison table of specification
21	Annealing for whiteheart malleable iron
22	Japanese experience in casting industry(abstract)
23	Structure of cast iron--3
24	Structure of cast iron--4
25	Structure of cast iron--5
26	Performance test for 500Kg high frequency induction furnace
27	The secondary performance test for H.F.F.
28	Countermeasure on power failure for H.F.F.
29	Operation of 100 Kg H.F.F.
30	Calculation for charging formulation for DCI
31	Test piece preparation

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MNC

LIST OF DATA SHEETS (3/3)

No.	Title
32	Melting procedure on DCI using H.F.F.--1
33	Melting procedure on DCI using H.F.F.--2
34	Calculation of Mg addition
35	Several method of Mg addition
36	Determination of graphite spheroidizing rate
37	Standard microstructure of carbon steel
38	Procedures on stainless steel castings
39	Sulphur print
40	Demanganese process
41	Explanation of graphite type for grey cast iron
42	Typical model structure for spheroidal graphite iron
43	Instruction for aluminium alloy melting(general information)
44	Comparison of characteristics among grey cast iron, spheroidal graphite cast iron and malleable cast iron
45	Ni-hard cast iron making
46	ND Tester
47	High Mn steel melting
48	SCC 5 steel melting
49	Desulphurisation Method
50	Malleable cast iron
51	Melting procedure for black-heart malleable cast iron
52	Annealing procedure for black-heart malleable cast iron
53	Procedure for lining work for FTU High Frequency Induction Furnace
54	Melting technique for Steel castings(Basic theory)
55	Austempered Spheroidal Graphite Cast Iron(Basic theory)
56	Compacted/ Vermicular Graphite Cast Iron(Basic theory)
57	Melting procedure for Aluminium alloy castings

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TENTATIVE TARGET PRODUCTS

Products	Type of Metal								Year of Practice				Classification / Application
	FC	FCU	FCMB	SC	FC-al	Al-al	Cu-al		1990	1991	1992	1993	
1. Brake Drum	0												Automobiles
2. Pulley	0												Automobiles, Palm Oil, Cement
3. Gear	0	0						0	0			0	Automobiles, Machine Tool
4. Gear Housing	0	0				0							Automobiles, Machine Tool*
5. Motor Cover	0												Electrical Equipment
6. Screw Press (Worm Screw)		0		0					0	0			Palm Oil
7. Hydrant	0												Housing
8. Hub		0											Automobiles
9. Bracket		0											Automobiles
10. Pipe Fitting			0							0	0		Housing
11. Roller										0	0		Rubber
12. Crawler Shoes										0	0		Tractor
13. Crusher Teeth					0								Mining, Construction
14. Valve													Housing
15. Parts for Electrical Appliances													Electrical, Equipment
16. Propeller													Marine

Remarks : * Mining, Palm Oil, Rubber, Cement

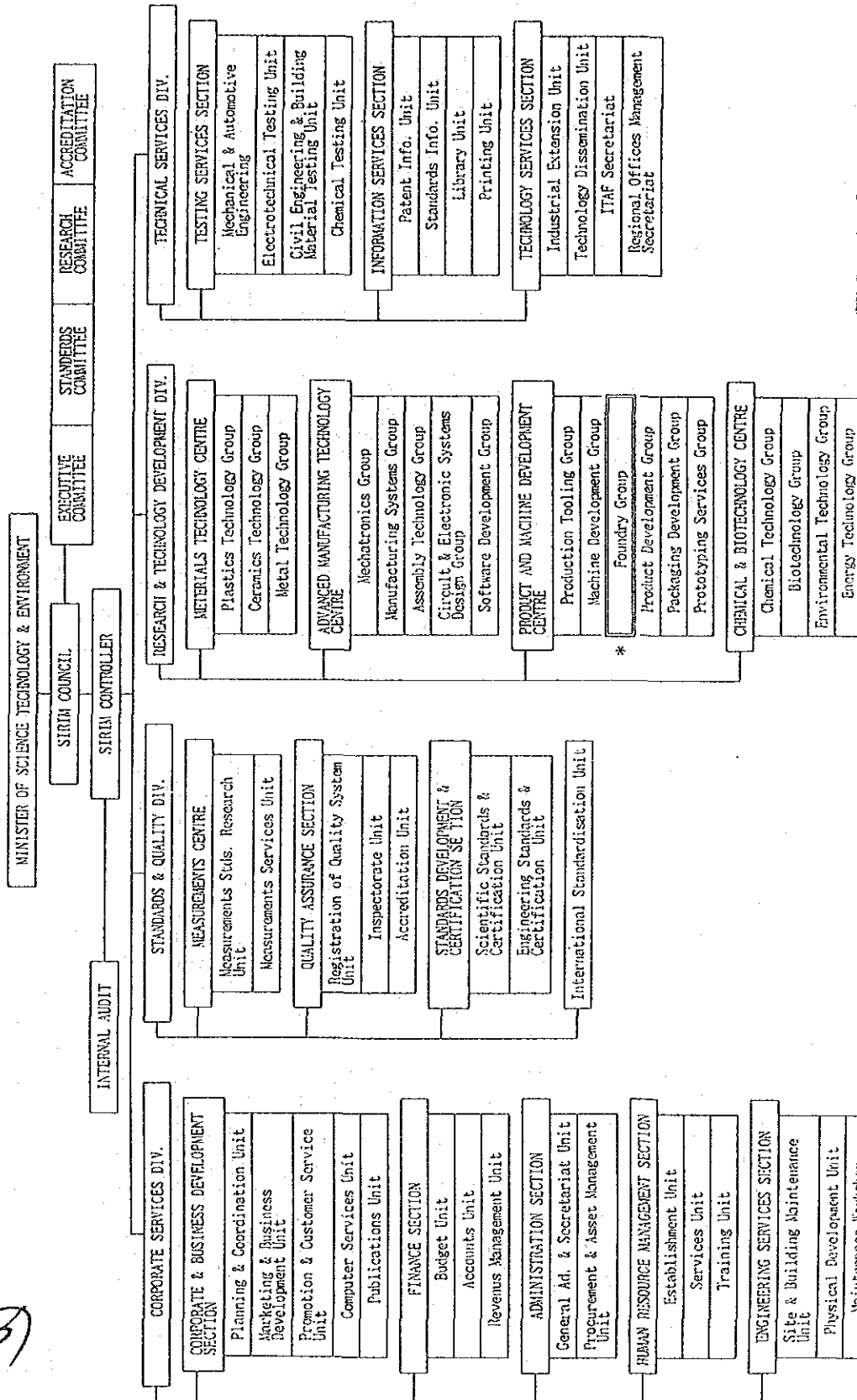
1) FC=Gray Cast Iron, FCD=Ductile Cast Iron, FCMB=Malleable Cast Iron, SC=Cast Steel, Al-al=Aluminum Alloy, Cu-al=Copper Alloy

2) Target products and year of practice are subject to change due to the level of acquired technology at FTU and requirements from industries.

LNC

SIRIM ORGANISATION STRUCTURE 1993

Annex 11



*: FTU Changed to Foundry Group (FG) in Jan. 1993 due to SIRIM organizational restructuring

MNC

LIST OF FOUNDRIES VISITED (1/3)

NO	COMPANY NAME	DATE	PLACE
1	SEE SENG FOUNDRY WORKS	04/07/89	KUALA LUMPUR
2	CHEONG FOUNDRY SDN. BHD	05/07/89	KUALA LUMPUR
3	YEW HUP SENG FOUNDRY SDN. BHD	11/07/89	KUALA LUMPUR
4	WENG SENG ENGINEERING WORKS	17/07/89	KUALA LUMPUR
5	LEAN HENG FOUNDRY	17/07/89	KUALA LUMPUR
6	WENG KIONG HARDWARE ENGINEERING	17/07/89	SELANGOR
7	SUN SANG HENG KEE FOUNDRY	26/07/89	KUALA LUMPUR
8	KWAN CHEONG ENGINEERING	26/07/89	KUALA LUMPUR
9	HENG YUEN FACTORY SDN. BHD	27/07/89	KUALA LUMPUR
10	NUM SOON METAL MFG. SDN. BHD	27/07/89	KUALA LUMPUR
11	ANSHIN CASTING	14/08/89	SELANGOR
12	YODOSHI MALLEABLE (M) SDN. BHD	23/08/89	MELAKA
13	SAPURA AUTOMOTIVE INDUSTRIES SDN. BHD	23/08/89	MELAKA
14	KINKO STEEL MILL SDN. BHD	23/08/89	JOHOR
15	SIN SOON HOE SDN. BHD	13/08/89	SELANGOR
16	NAM YONG FOUNDRY SDN. BHD	04/09/89	KUALA LUMPUR
17	DAH YUNG STEEL SDN. BHD	04/09/89	KUALA LUMPUR
18	WAH CHEONG FOUNDRY SDN. BHD	05/09/89	IPOH
19	TEAK HENG FOUNDRY SDN. BHD	19/09/89	IPOH
20	HUP NGAI LOONG FOUNDRY SDN. BHD	19/09/89	IPOH
21	YAU FONG FOUNDRY SDN. BHD	20/09/89	IPOH
22	TASEK IRON & STEEL SDN. BHD	20/09/89	IPOH
23	YOONSTEEL SDN. BHD	20/09/89	IPOH
24	PRUDENCE METAL SDN. BHD	21/09/89	IPOH
25	KWAN CHEONG ENGINEERING SDN. BHD	13/02/90	KUALA LUMPUR
26	SIN SOON HOE SDN. BHD	19/02/90	SELANGOR
27	UNITED CASTING COMPANY SDN. BHD	29/03/90	SELANGOR
28	SIN SOON HOE SDN. BHD	16/04/90	SELANGOR
29	SIN SOON HOE SDN. BHD	19/04/90	SELANGOR
30	ANSHIN CASTING SDN. BHD	24/05/90	SELANGOR
31	SIN SOON HOE SDN. BHD	01/06/90	SELANGOR
32	SIN SOON HOE SDN. BHD	08/06/90	SELANGOR
33	AMALGAMATED STEEL MILL SDN. BHD	30/07/90	SELANGOR
34	ANSHIN CASTING SDN. BHD	21/11/90	SELANGOR
35	KWAN CHEONG ENGINEERING SDN. BHD	22/11/90	KUALA LUMPUR
36	DAH YUNG FOUNDRY SDN. BHD	25/11/90	KUALA LUMPUR
37	HICOM ENGINEERING SDN. BHD	06/03/91	SELANGOR
38	CASTALL SDN. BHD.	13/05/91	SELANGOR
39	CHAN WEI WOODEN WARE FACTORY SDN. BHD	22/05/91	SELANGOR
40	YUN KOW WOOD PATTERN SDN. BHD	22/05/91	SELANGOR
41	CHEE SENG WOODEN MOULD FACTORY SDN. BHD	22/05/91	SELANGOR
42	AUTOMATED ENGINEERING PRODUCT SDN. BHD.	01/07/91	IPOH

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LIST OF FOUNDRIES VISITED (2/3)

NO	COMPANY NAME	DATE	PLACE
43	CAST IRON PRODUCTS SDN. BHD.	16/07/91	SELANGOR
44	INDAH FOUNDRY SDN. BHD.	16/07/91	SELANGOR
45	FINECAST INDUSTRY SDN. BHD.	18/07/91	SELANGOR
46	TAUNG LIANG INDUSTRY SDN. BHD.	23/07/91	SELANGOR
47	SOLIDCAST INDUSTRIES SDN. BHD.	25/07/91	SELANGOR
48	HUNG CHANG MACHINE MOULDING SDN. BHD.	25/07/91	SELANGOR
49	GUP HUP SENG SDN. BHD.	06/08/91	SELANGOR
50	YOONSTEEL MALAYSIA SDN. BHD.	19/08/91	IPOH
51	MELOKCAST SDN. BHD.	19/08/91	IPOH
52	TASEK IRON & STEEL FOUNDRY SDN. BHD.	20/08/91	IPOH
53	SUN WENG HING HUP KEE FOUNDRY SDN. BHD.	20/08/91	IPOH
54	CHEE PENG CASTING MANUFACTURER	21/08/91	IPOH
55	MENGLERU WAH CHEONG FOUNDRY SDN. BHD.	21/08/91	IPOH
56	CHAN BROTHERS ENGINEERING WORKS	21/08/91	IPOH
57	ARMCON DESIGN & FABRICATION SDN. BHD.	21/08/91	IPOH
58	TONG FOONG METALS INDUSTRIES	22/08/91	IPOH
59	PRUDENCE METALS SDN. BHD.	22/08/91	IPOH
60	CHUN KHONG ENGINEERING TRADE SDN. BHD.	23/08/91	IPOH
61	TEAK HENG FOUNDRY SDN. BHD.	23/08/91	IPOH
62	YUEN LEE ENGINEERING WORK	24/08/91	IPOH
63	HUP NGAI LOONG FOUNDRY SDN. BHD.	24/08/91	IPOH
64	YODOSHI MALLABLE SDN. BHD.	12/09/91	MELAKA
65	SAPURA AUTOMOTIVE SDN. BHD.	12/09/91	MELAKA
66	KWAN CHEONG MACHINE MOULDING & TRADING	20/11/91	KUALA LUMPUR
67	CHEONG FOUNDRY SDN. BHD.	20/11/91	KUALA LUMPUR
68	AUTOMATED ENGINEERING PRODUCTS SDN. BHD.	18/12/91	SELANGOR
69	MATSUSHITA FOUNDRY INDUSTRIES SDN. BHD.	12/11/91	MELAKA
70	SENG FATT ENGINEERING	29/01/92	KUALA LUMPUR
71	SUN HENG ENGINEERING WORKS	17/03/92	SELANGOR
72	GAH HUP SENG SDN. BHD.	27/03/92	SELANGOR
73	KINKO STEEL MILL SDN. BHD.	27/01/92	JOHOR
74	JOHORE SILICA SAND SDN. BHD.	28/01/92	JOHOR
75	SIME DARBY/BKT. RAJA PALM OIL PLANTATION	21/04/92	SELANGOR
76	MALAYSIAN SHEET GLASS BERHAD	28/04/92	SELANGOR
77	CHAN WEI WOODEN WARE FACTORY	24/06/92	KUALA LUMPUR
78	MENTRADE ENGRA & FOUNDRY	22/04/92	IPOH
79	YOONSTEEL SDN. BHD.	25/05/92	IPOH
80	METLOKCAST	25/05/92	IPOH
81	A. A. TECHNOLOGIES SDN. BHD.	26/05/92	IPOH
82	BRADKEN MALAYSIA	26/05/92	IPOH
83	IPOH PATTERN MAKING	27/05/92	IPOH
84	TEAK HENG FOUNDRY	27/05/92	IPOH

4

MVC

LIST OF FOUNDRIES VISITED (3/3)

NO	COMPANY NAME	DATE	PLACE
85	T. F. METAL INDUSTRIES SDN. BHD.	27/05/92	IPOH
86	ARMCON ENGINEERING SDN. BHD.	27/05/92	IPOH
87	WIN KEY PATTERN WORKS SDN. BHD.	28/05/92	IPOH
88	CHEE PENG CASTING SDN. BHD.	28/05/92	IPOH
89	ASSOCIATED METAL WORKS SDN. BHD.	30/06/92	SARAWAK
90	SYARIKAT SEBANGUN SDN. BHD.	01/07/92	SARAWAK
91	ASIAN FOUNDRY CENTRE SDN. BHD.	03/07/92	FEDERAL TERRITORY, LABUAN
92	SHIN SOON HOE FOUNDRY ENGINEERING	03/09/92	SELANGOR
93	YOONSTEEL (M) SDN. BHD.	02/11/92	IPOH
94	A. A. TECHNOLOG SDN. BHD.	02/11/92	IPOH
95	WIN KEY PATTERN	03/11/92	IPOH
96	CHEE PENG WOOD PATTERN	03/11/92	IPOH
97	SUN WENG HING KEE FOUNDRY	03/11/92	IPOH
98	CHEE PENG WOOD PATTERN	04/11/92	IPOH
99	IPOH PATTERN MAKING	04/11/92	IPOH
100	CCH HARDWARE INDUSTRIES	29/10/92	SELANGOR
101	SEE SANG FOUNDRY WORKS	04/11/92	SELANGOR
102	N. S. AUTO PARTS	09/11/92	NEGERI SEMBILAN
103	SHIN SOON HOE FOUNDRY ENGINEERING	04/01/93	SELANGOR
104	REKA-BERSATU FOUNDRY	12/01/93	SELANGOR
105	神戸製鋼所・銅製品工場	21/01/93	SELANGOR
106	METROD	03/02/93	SELANGOR
107	HICOM ENGINEERING SDN. BHD	08/02/93	SELANGOR
108	再友成铸造	08/02/93	SELANGOR
109	GAH HUP SENG SDN. BHD	17/02/93	SELANGOR
110	LEOS METAL INDUSTRIES	23/02/93	IPOH
111	MATERIAL PERFORMANCE ENGINEERING	22/02/93	SELANGOR
112	海味興船物零件公司	02/03/93	SELANGOR
113	YODOSI MALLABLE SDN. BHD.	20/04/93	MELAKA
114	SAPURA AUTOMOTIVE SDN. BHD.	20/04/93	MELAKA

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LIST OF INFORMATION SERVICES

No	Date	Name of Company	Type of Service Requested
1	08/01/90	JASNI NIAGA ENTERPRISE	Advisory Service
2	10/01/90	TEAK HENG FOUNDRY SDN BHD	Consultation
3	12/05/90	TAF ENGINEERING	Consultation
4	20/05/90	CHUN KHONG ENGINEERING TRADE SDN BHD	Advisory Service
5	27/08/90	UNIVERSITI TEKNOLOGI MALAYSIA	Technical Advice
6	19/12/90	AA TECHNOLOGIES SDN BHD	Consultation
7	20/08/91	TASEK IRON & STEEL FOUNDRY SDN BHD	Consultation
8	18/09/90	FOUNDRY TECH ENT SDN BHD	Information
9	15/12/92	BRIGHTYIELD SDN. BHD.	Consultation
10	21/12/92	HICOM DIE-CASTING	Information
11	21/01/93	HICOM ENGINEERING SDN BHD	Information
12	08/02/93	HICOM ENGINEERING SDN BHD	Consultation
13	16/02/93	NOURELLES ENGINEERING SDN BHD	Consultation
14	20/02/93	LEOS METAL INDUSTRIES SDN BHD	Consultation
15	24/02/93	MATERIAL PERFORMANCE ENGINEERING	Technical Advice
16	25/02/93	SUKMA FOUNDRY	Consultation
17	26/02/93	YOONSTEEL (M) SDN BHD	Information
18	13/03/93	INKWA FOUNDRY	Improve
19	25/03/93	TEIPENG LINER/T.P LINER S/B	Technical

LIST OF TEST AND INSPECTION SERVICES**(For the period of Jan. 1991 to May 1993)**

Types of Material Tested	Year		
	1991	1992	1993
Ferrous	90	173	86
Non-Ferrous	77	60	40
Sand	3	25	8
Others	4	6	3
Total	174	264	137

*B**MV*

LIST OF SEMINARS (1/2)

I. SEMINARS

No	DATE / VENUE	MAIN THEME	SUB THEME	LECTURER
1	25 November, 1990 Block K, SIRIM	INTRODUCTION TO FTU AND ITS ACTIVITIES & FOUNDRY TECHNOLOGY IN OTHER COUNTRIES	<ol style="list-style-type: none"> 1) Role of FTU in Malaysian Industry 2) Computer Software Application in Casting Design 3) Mould Properties toward Dimensional Accuracy of Casting 4) Controlling of Composition in Cast Iron 5) Application of Wavelength Dispersive Method in Compositional Analyses of Metals 6) The Present Status of Iron Foundry Industry 7) Japanese Investment in Thai Foundry Industry 8) Development of Foundry Technology and Its Prospects 	Helme Hashim Muhammad Fauzi bin Ismail Jamil bin Suleiman Mohd. Akbar bin Yeop Kamaruddin Lee Lay Kuan Denni Sukhotanang Takeshi Izumi Kenji Chijiwa
2	29-30 May, 1991 Titanium Room, SIRIM	MOULDING TECHNOLOGY	<ol style="list-style-type: none"> 1) Advanced Foundry Shop Layout 2) Introduction to The State-of-art Moulding Equipment & Process 3) Characteristics of Moulding Materials and Their Effect to The Mould Properties 4) Sand Testing - Its Importance & Practice 	Shouhei Ono Shouhei Ono Nobuyuki Fukai Jamil bin Suleiman
3	21 November, 1991 Titanium Room, SIRIM	QUALITY CASTING THROUGH QUALITY MELTING	<ol style="list-style-type: none"> 1) Production of Gray Cast Iron - Fundamental of Melting Practice 2) Production of Quality As-Cast Ductile Iron by Induction Furnace Melting 3) Fundamentals of Steel Casting and Its Recent Development 4) Induction Furnace and Ladle Refractories for the Production of Quality Iron and Steel Casting 	Katsuhiko Fujihira Mohd. Akbar bin Yeop Kamaruddin Senri Okada David. R. Newsome
4	20 February, 1992 Block 24, SIRIM	Ductile Iron Casting Clinic		John Wheelton
5	21 July, 1992 Titanium Room, SIRIM	CASTING DESIGN, PATTERN MAKING AND INSPECTION	<ol style="list-style-type: none"> 1) Casting Design and Simulation 2) Test and Inspection of Casting 3) Pattern Making 4) Marketing and Export of Casting 	Azmaizam Hj. Mohd Zain Lee Lay Kuan Tsuneto Nonaka Charlie Martella
6	6 October, 1992 Block 24, SIRIM	SEMINAR ON RECENT DEVELOPMENT OF FOUNDRY TECHNOLOGY	<ol style="list-style-type: none"> 1) Fundamentals Technology of Induction Furnace 2) Furan Process Sand Reclamation 3) Technical Features and Economical Application of the Japanese Foundry Vacuum Replacement Hardness (VRH) Process Moulding and Sand Reclamation 4) Vacuum Replacement Hardness (VRH) Process Moulding and Sand Reclamation 	Michio Kawasaki Tokuyuki Yamanaka Michio Kawasaki Tokuyuki Yamanaka
7	25 November, 1992 Titanium Room, SIRIM	UPGRADING CASTING QUALITY THROUGH MOULDING	<ol style="list-style-type: none"> 1) Local Sand Characteristics - An Interim Report 2) Off-Line Quality Control in Foundry - Taguchi Method 3) Fundamental Concept of Green Sand Control and Treatment 4) The Foundry Industry in ASEAN - The Way Forward 	Romzee Ismail Hasnul Akmal Haron Akinaga Ohdaira Tetsuji Iseegawa
8	30 March, 1993 Titanium Room, SIRIM	Control and Prevention of Casting Defects		Raydn Thomas

II. COLLOQUIUMS

No	DATE	VENUE	THEME	LECTURER
9	12 March, 1991	Block 24, SIRIM	Towards Upgrading of Foundry Industry in Malaysia	Shinjiro Kasamoto
10	14 April, 1992	Titanium Room, SIRIM	Application of Quality Control Technique in a Foundry	Nobuyuki Ohsawa
11	27 May, 1992	DOHFEIA Room, IPOH	Pattern Making	Tsuneto Nonaka
12	5 November, 1992	Block 24, SIRIM	Aluminium Alloy Casting Method and Its Future Prospect	Iitromi Matsuhara
13	13 April, 1993	ISO Room, SIRIM	Impregnation Process for Casting Products	Kunitoshi Ueda
14	27 April, 1993	Block 24, SIRIM	Copper and Copper Alloy Casting : Quality Casting Through Scraps Control	Kohitaro Kashim

LIST OF SEMINARS (2/2)

No.	date	from	name
1	19/06/89~13/07/89	UNIVERSITY TECHNOLOGY MALAYSIA	1) Kamaruzaman Shaari 2) Jamalul Khair 3) Mohd Hasnan Hanafi 4) Juraidah Jahan
2	19/06/89~13/07/89	INSTITUTE TECHNOLOGY MARA	1) Mahd Faisal 2) Abd. Nasia 3) Mohd. Nor Ismail 4) Abd. Aziz Chik 5) Rakimi Apandi
3	26/02/90~03/03/90	UNIVERSITY SAINS MALAYSIA, IPOH, PERAK	1) Norjamilah Chekari
4	21/05/90~30/06/90	UNIVERSITY TECHNOLOGY MALAYSIA, JOHOR BAHRU	1) Noorhisham Abdulah 2) Nor Azman Mansor 3) Noorman Ilias 4) Noranaz Mohd. Noor
5	04/09/90~29/09/90	UNIVERSITY TECHNOLOGY MALAYSIA	1) Wan Mohd. Sokri 2) Mohd. Rosli Hussain
6	14/11/90	HICOM ENGINEERING Sdn. Bhd.	1) Roslan Abdul Ghani 2) Musa Othman 3) Muhamad Rais Salleh 4) Mustafa Kamar Alias 5) Izhar Kahar
7	06/05/91~18/05/91	UNIVERSITY KEBANGSAAN MALAYSIA	1) Riyaz Hj. M. Mohamad
8	01/06/92~30/06/92	UNIVERSITY SAINS MALAYSIA, PERAL	1) Abd. Rashid b. Selamat
9	14/12/92~31/05/93	INSTITUTE KEMAHIRAN MARA, LUMUT, PERAK	1) Harun Mohd. 2) Ahmad Wazir 3) Abu Bakar 4) Faizul Hisham

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LIST OF R&D PRODUCTS

Products	Type of Metal										Year of Practice				Classification / Application
	FC	FCD	FCMW	SC	FC-al	Al-al	Cu-al	1990	1991	1992	1993				
1. Plate	0	0						0						Souvenir	
2. Ingot Case	0	0					0							Mould	
3. Aluminium Plate						0		0						Pattern	
4. Test Piece		0		0		0		0		0			0	Test piece	
5. Kick Starter-Y80				0				0						Automobiles	
6. Kick Starter-Y100				0				0						Automobiles	
7. Lump Post								0						Decorative	
8. Tool Rest	0							0						Machine	
9. TV Support Bracket	0							0						Machine	
10. Track Roller - Single Flange														Earth Moving Equipment	
11. Indian Screw Press (casting design only)				0										Earth Moving Equipment	
12. Cooling Tower Propeller Holder														Cooling Tower	
13. Fire Hydrant														Sefty Equipment	
14. Pelletizer	0													Housing	
15. Track Roller - Double Flange				0										Earth Moving Equipment	
16. Casting Contest Pattern (pattern only)	0			0										Automobiles	
		0												Test piece	

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LIST OF MEETINGS HELD IN FTU

Meeting	Purpose	Participant	Time
1. Technology transfer meeting	To review and discuss the progress of the previous week activities and to plan the schedule for the following week	All FTU members including Japanese Experts and Malaysian Counterparts	Weekly, Monday morning
2. Japanese Expert Meeting	To review and discuss the activities of previous week and to plan the schedule for the following week	All Japanese Experts	Weekly, Friday morning
3. Japanese Expert and Malaysian Counterpart Meeting	To review the activities of the previous week and to plan and schedule for the following week at officer/expert level	All Japanese Experts and Malaysian Counterparts (Research Officers)	Fortnightly, Friday afternoon
4. FTU Management Meeting	To discuss the overall activities of the Unit	All Malaysian Counterparts including management staffs	Monthly
5. Safety Members Meeting	To review and discuss on the safety aspect in FTU	All safety members	Monthly
6. Quality Control Circle (QCC) Meeting	To discuss on the specific matter regarding to the quality of work	Quality Control Circle Members	Weekly

JAPANESE EXPERTS DISPATCHED BY JICA

(a) Long-Term Experts

- Chief Advisor

- | | | |
|----|---------------|---------------------------------|
| 1. | Naomichi Hara | June 7, 1989 - June 5, 1991 |
| 2. | Hideaki Ota | June 1, 1991 - October 12, 1993 |

- Coordinator

- | | | |
|----|------------------|-----------------------------------|
| 3. | Hiroshi Kanamori | March 16, 1989 - October 12, 1993 |
|----|------------------|-----------------------------------|

- Melting

- | | | |
|----|--------------------|----------------------------------|
| 4. | Shinjiro Masamoto | March 16, 1989 - March 15, 1991 |
| 5. | Katsuhiko Fujihira | March 8, 1991 - October 12, 1993 |

- Moulding

- | | | |
|----|----------------|-------------------------------------|
| 6. | Nobuyuki Fukai | November 9, 1989 - November 5, 1991 |
| 7. | Akinaga Odaira | October 12, 1991 - October 12, 1993 |

- Pattern Making

- | | | |
|----|----------------|-------------------------------------|
| 8. | Tsuneto Nonaka | October 24, 1990 - October 12, 1993 |
|----|----------------|-------------------------------------|

(b) Short - Term Experts

- Expert Survey Team (4)

April 28, 1988 - May 12, 1988

- | | |
|----|--------------------|
| 1. | Makoto Yamashita |
| 2. | Katsuhiko Fujihira |
| 3. | Noriyasu Oe |
| 4. | Takeo Ohno |

- Expert Survey Team (6)

March 29 1989 - April 3, 1989

- | | |
|-----|------------------|
| 5. | Naomichi Hara |
| 6. | Makoto Yamashita |
| 7. | Noriyasu Oe |
| 8. | Takeo Ohno |
| 9. | Kohiro Ohshita |
| 10. | Nobuyuki Fukai |

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- Expert Survey Team (2) September 20, 1989 - September 30, 1989.
 - 11. Noriyasu Oe
 - 12. Takeo Ohno

- Melting January 10, 1990 - May 25, 1990
 - 13. Fumio Obata

- Moulding February 2, 1990 - May 25, 1990
 - 14. Yoshiaki Matsunami

- Pattern Making February 2, 1990 - May 25, 1990
 - 15. Hideo Kikuchi

- Installation of Equipment
 - 16. Soujiro Ohta January 10, 1990 - January 25, 1990
 - 17. Takeo Ohno February 2, 1990 - March 16, 1990
 - 18. Hiroshi Kuroki February 8, 1990 - March 8, 1990
 - 19. Akira Takeuchi February 22, 1990 - March 16, 1990

- Expert Survey Team (3) May 3, 1990 - May 12, 1990
 - 20. Makoto Yamashita
 - 21. Noriyasu Oe
 - 22. Katsuhiko Fujihira

- Installation of Equipment July 5, 1990 - July 19, 1990
 - 23. Takeo Ohno
 - 24. Satoru Kanbe

- Quality Control September 26, 1990 - December 1, 1990
 - 25. Akihiro Kato

- Test and Inspection September 26, 1990 - December 1, 1990
 - 26. Yojiro Kotani

- Foundry Technology (Seminar) November 22, 1990 - November 27, 1990
 - 27. Kenji Chijiwa

5)

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- Casting Design August 2, 1991 - September 27, 1991
28. Yoshio Akatsuka
- Test and Inspection September 25, 1991 - November 21, 1991
29. Toshiyuki Nishio
- Foundry Technology (Seminar) November 18, 1991 - November 24, 1991
30. Senri Okada
- Quality Control February 20, 1992 - April 19, 1992
31. Nobuyuki Osawa
- X-Ray Fluorescence May 11, 1992 - May 29, 1992
32. Nobuyasu Ohara
- Aluminium Alloy Casting September 17, 1992 - November 17, 1992
33. Hiromi Matsubara
- Casting Drawing September 17, 1992 - November 17, 1992
34. Kazumi Ishikawa
- Resin Pattern Making September 17, 1992 - November 17, 1992
35. Michiharu Tsuchiya
- Resin Sand Moulding January 14, 1993 - March 13, 1993
36. Takashi Inanaga
- Copper Alloy Casting January 14, 1993 - April 29, 1993
37. Kohtaro Kashima

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JAPANESE TEAMS DISPATCHED BY JICA

Preliminary Survey Team (5)	September 21, 1987 - October 2, 1987
Implementation Survey Team (5)	October 5, 1988 - October 13, 1988
Consultation Team (6)	November 9, 1989 - November 17, 1989
Technical Guidance Team (6)	November 22, 1990 - December 1, 1990
Technical Guidance Team (4)	February 24, 1992 - March 1, 1992
Consultation Team (4)	December 7, 1992 - December 16, 1992
Evaluation Team (5)	May 19, 1993 - June 2, 1993

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COUNTERPART PERSONNEL TRAINED IN JAPAN

1.	Helme Hashim	Project Management	Feb. 20, 1989 - Mar. 7, 1989
2.	Mohd Yusoff Sopian	Pattern Making	May. 14, 1989 - Aug. 16, 1989
3.	Zain Azlan Ujang	Melting	May. 14, 1989 - Aug. 16, 1989
4.	Mohd Faiz Eyub	Moulding	May. 14, 1989 - Aug. 16, 1989
5.	Rosli Hussain	Casting Drawing	May. 14, 1989 - Aug. 16, 1989
6.	Muhammad Fauzi Ismail	Pattern Making	May. 27, 1990 - Sep. 29, 1990
7.	Mohd Akhir Yeop Kamaruddin	Melting	May. 27, 1990 - Sep. 29, 1990
8.	Jamil Suleiman	Moulding	May. 27, 1990 - Sep. 29, 1990
9.	Lee Lay Kuan	Test & Inspection	May. 27, 1990 - Sep. 29, 1990
10.	Mohd Radzi Harun	Pattern Making	May. 9, 1991 - Aug. 13, 1991
11.	Hisham Mohd Aris	Melting	May. 9, 1991 - Aug. 13, 1991
12.	Azhar Abdullah	Test & Inspection	May. 9, 1991 - Aug. 13, 1991
13.	Azmaizam Hj. Mohd Zain	Product Development	Sep. 4, 1991 - Mar. 8, 1992
14.	Kamarullail Mahad	Quality Control	Nov. 5, 1991 - Feb. 11, 1992
15.	Ahmad Kamal Ariffin	Moulding	Nov. 5, 1991 - Feb. 11, 1992
16.	Nor Baha Kassim	Finishing	Nov. 5, 1991 - Feb. 11, 1992
17.	Rosman Iteng	Pattern Making	May. 20, 1992 - Aug. 12, 1992
18.	Romzee Ismail	Moulding	May. 20, 1992 - Aug. 12, 1992
19.	Hasnul Akmal Haron	Quality Control	May, 20, 1992 - Aug. 12, 1992
20.	Kathiga Kumar Lechumanan	Casting Drawing	May. 13, 1993 - Aug. 10, 1993
21.	Ahmad Fozi Surati	Moulding	May. 13, 1993 - Aug. 10, 1993
22.	Inas Saidin	Test & Inspection	May. 13, 1993 - Aug. 10, 1993

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MACHINERY AND EQUIPMENT PROVIDED BY JICA
(EQUIPMENT LIST)

TITLE	PAGE
1. Melting	1 - 3
2. Moulding	4 - 5
3. Core Making	6
4. Sand Preparation	7
5. Finishing	8 - 9
6. Air Compressor	10
7. Instrumental Analysis	11 - 15
8. Physical Test	16
9. Sand Test	17 - 20
10. Pattern Making	21 - 26
11. Information Instrument	27 - 28
12. Vehicle	29
13. Book	1 - 17

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Equipment List / Foundry Group

R/D NO	NAME OF EQUIPMENT	QUANTITY	ARRIVAL	PLACE	IN CHARGE	CONDITION	PRICE	BUDGET
1	MELTING							
101-1	500kg DURA-LINE FURNACE (#84319) WITH RING HOOD	1 pc	14/12/89 YPK - 23	MELTING SECTION	ROSMAN	SERVICEABLE	¥ 6,000,000.-	昭和63年度供与機材 (本部購送)
101-2	MELTING POWER SUPPLY 325KW-3000HZ VIP POWER - TRAK (#89-84200-245-11)	1 pc	"	MELTING SECTION	ROSMAN	SERVICEABLE	¥21,500,000.-	"
102	100kg DURA-LINE FURNACE (#83271) WITH RING HOOD	1 pc	14/12/89 YPK - 23	MELTING SECTION	ROSMAN	SERVICEABLE	¥3,100,000.-	昭和63年度供与機材 (本部購送)
103	#60 SINGLE PUSH-OUT FURNACE (#84200)	1 pc	14/12/89 YPK - 23	MELTING SECTION	ROSMAN	SERVICEABLE	¥1,800,000.-	昭和63年度供与機材 (本部購送)
104	HYDRAULIC POWER SUPPLY	19 pcs	14/12/89 YPK - 23	MELTING SECTION	ROSMAN	SERVICEABLE	¥700,000.-	昭和63年度供与機材 (本部購送)
	WATER COOLED MODULE	5 pcs	"	OUT SIDE FOUNDRY	ROSMAN	SERVICEABLE	¥4,700,000.-	"
	TRANSFORMER	1 pc	"	MELTING SECTION	ROSMAN	SERVICEABLE	¥4,500,000.-	"
	ACCESSORIES & SPARE PARTS	399 pcs	"	MELTING SECTION	ROSMAN	SERVICEABLE	¥1,200,000.-	"
105	DUST COLLECTOR	1 set	07/12/89 NPK - 002	MELTING SECTION	ROSMAN	SERVICEABLE	¥5,900,000.-	昭和63年度供与機材 (本部購送)
106-1	FLOOR SCALE, MODEL NUMBER DI-2	1 unit	12/08/89 YPK - 08	MELTING SECTION	ROSMAN	SERVICEABLE	¥3,200,000.-	昭和63年度供与機材 (本部購送)
106-2	SCALE, MODEL NUMBER SD-50	1 unit	"	MELTING SECTION	ROSMAN	SERVICEABLE	¥51,000.-	"
107-1	GEARED CRANE LADLE, MODEL NIG-500	2 units	12/08/89 YPK - 08	MELTING SECTION	ROSMAN	SERVICEABLE	¥1,320,000.-	昭和63年度供与機材 (本部購送)
107-2	GEARED CRANE LADLE, MODEL NIG-100	2 units	"	MELTING SECTION	ROSMAN	SERVICEABLE	¥1,320,000.-	"
107-3	GEARED CRANE LADLE, MODEL NIG-50 WITH BRICKS	1 unit	"	MELTING SECTION	ROSMAN	SERVICEABLE	¥437,000.-	"
108	GAS BURNER, MODEL TMG-68-L-D WITH STAND	1 set	12/08/89 YPK - 08	MELTING SECTION	ROSMAN	SERVICEABLE	¥1,650,000.-	昭和63年度供与機材 (本部購送)
109	OVER HEAD HOIST CRANE	2 sets	"	WORK SHOP	ZAIN	SERVICEABLE	-	PREPARATION OF SIRM SIDE
110	FORK LIFT CAR	1 unit	31/03/89	WORK SHOP	ZAIN	SERVICEABLE	¥\$78,500.-	昭和63年度供与機材 (現地購送)
111-1	MODEL 743 c/w STD EQPT YOKOGAWA RECORDER MODEL: 3701-86 (LR 8100) WITH STANDARD ACCESSORIES;	1 set	06/02/92 YHPS-07	MELTING SECTION	ROSMAN	SERVICEABLE	¥1,550,000.-	平成 3年度供与機材 (本部購送)

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Equipment List / Foundry Group

R/D NO	NAME OF EQUIPMENT	QUANTITY	ARRIVAL	PLACE	IN CHARGE	CONDITION	PRICE	BUDGET
1	MELTING							
111-2	OPTIONAL FEATURE FOR YOKOGAWA RECORDER MODEL 3701-86 (LR 8100) 1. DC Power Source 2. RS-232-C Interface 3. Mathematical Function 4. Alarms 5. Remote Controls 6. F Display	1 set	06/02/92 YHPK-07	MELTING SECTION	ROSMAN	SERVICEABLE	¥446,500	平成 3年度供与機材 (本邦贈送)
		"	"	"	"	"	"	"
112-1	MAGNESITE CRUCIBLE 230 X 200 X 370	2 pcs	06/02/92	MELTING SECTION	ROSMAN	SERVICEABLE	¥302,000	平成 3年度供与機材 (本邦贈送)
-2	SPINEL CRUCIBLE 230 X 200 X 370	2 pcs	YHPK-07	MELTING SECTION	ROSMAN	SERVICEABLE	¥302,000	"
113	C/F FUSE 800 AMP : PART NO.A.135, A.105	3 pcs	16/01/93	STORE	ROSMAN	SERVICEABLE	¥52,520	平成 4年度現地研究費
114	WEAT RESISTANCE WIRELESS CRANE SCALES Cap.: 1,000kggs Reading scale: 1kg Receiver (AC100-10% Accessories: Battery Charger for 100V Transformer (1φ, 240V, 50Hz/100V) Spare Battery Rack Stand	1 set	06/02/92 YHPK-07	MELTING SECTION	ROSMAN	SERVICEABLE	¥1,553,000	平成 3年度供与機材 (本邦贈送)
		"	"	"	"	"	"	"
115-1	K MOLD (2pcs/set)	1 set	10/09/92	MELTING SECTION	ROSMAN	SERVICEABLE	¥70,000	松原専門委託機材 (平成 4年度)
115-2	GRAPHITE MELTING POT	10 pcs	232-86922-791				¥40,000	
115-3	PHOSPHORIZER A3 (STANDARD TYPE)	3 pcs					¥21,600	
115-4	MOREX BOTTLE NO.3	3 pcs					¥10,500	
115-5	-ditto- NO.5	3 pcs					¥18,000	
115-6	HALF CYLINDER (HLS250/250G)	2 pcs					¥92,000	
115-7	STANDARD BLOCK (AS60)	2 pcs					¥56,000	
115-8	THERMO CONTROL UNIT (NP2030D)	1 pc					¥247,000	
115-9	CASSETE RIBBON (B9585SH)	4 pcs					¥10,000	
115-10	FOLDING CHART	20 sets					¥30,000	
115-11	PEN CARTRIDGE	10 sets					¥24,000	

Equipment List / Foundry Group

R/D NO	NAME OF EQUIPMENT	QUANTITY	ARRIVAL	PLACE	IN CHARGE	CONDITION	PRICE	BUDGET
1	<u>MELTING</u>							
115-12	LIFT COVER (B9585AY)	1 pc	10/09/92	MELTING SECTION	ROSMAN	SERVICEABLE	¥5,000	松原専門家移行機材
115-13	LITHIUM CELL (A9588ZB)	1 pc	232- 86922791				¥2,000	
115-14	-ditto- (9586JU)	2 pcs					¥1,000	
115-15	LEAD CORD (89408JA)	20 pcs					¥30,000	
115-16	MEMORY CORD (3789-01)	1 pc					¥6,000	

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Equipment List / Foundry Group

R/D NO	NAME OF EQUIPMENT	QUANTITY	ARRIVAL	PLACE	IN CHARGE	CONDITION	PRICE	BUDGET
2	<u>MOULDING</u>							
201	JOLT SQUEEZE STRIPPER MOULDING MACHINE	2 sets	07/12/89 YPK - 002	MOULDING SECTION	ROMZEE	SERVICEABLE	¥3,300,000.-	昭和63年度供与機材 (本邦購送)
202	ROLLER CONVEYOR, HH TYPE (PARALLEL) WIDTH : 300mm. LENGTH : 3,000 mm.	1 set	12/08/89 YPK - 08	MOULDING SECTION	ROMZEE	SERVICEABLE	¥203,600.-	昭和63年度供与機材 (本邦購送)
203-1	MOULDING FLASK 1000 X 800 X 300 / 250 WITH MOULDING BOARD, GAGGER, CLAMP, GUIDE PINBUSH & HUNGER	3 sets	19/10/89 YPK - 15	MOULDING SECTION	ROMZEE	SERVICEABLE	¥3,300,000.-	昭和63年度供与機材 (本邦購送)
203-2	MOULDING FLASK 580 X 460 X 250 / 250 WITH MOULDING BOARD, GAGGER, CLAMP, GUIDE PINBUSH & HUNGER	5 sets	"	MOULDING SECTION	ROMZEE	SERVICEABLE	¥3,600,000.-	"
203-3	MOULDING FLASK 300 X 240 X 200 / 200 WITH MOULDING BOARD, GAGGER, CLAMP, GUIDE PINBUSH & HUNGER	10 sets	"	MOULDING SECTION	ROMZEE	SERVICEABLE	¥5,400,000.-	"
204	AIR RAMMER, MODEL FR - 0, FR - 01.	2 sets	12/08/89 YPK - 08	SAND TESTING ROOM	ROMZEE	SERVICEABLE	¥202,500.-	昭和63年度供与機材 (本邦購送)
205-1	TOOLING OF TEST BAR (FOR FLASK SIZE 580 X 460)	1 set	19/10/89 YPK - 16	SAND TESTING ROOM	ROMZEE	SERVICEABLE	¥1,300,000.-	昭和63年度供与機材 (本邦購送)
205-2	TOOLING OF TEST PIECE (FOR FLASK SIZE 300 X 240)	1 set	"	SAND TESTING ROOM	ROMZEE	SERVICEABLE	¥1,100,000.-	"
206	ALUMINIUM OPENING AND SHUTTING METAL FRAME NO. 13 300 X 400 X 100 / 100	2 sets	05/01/89 232- 98041484	SAND TESTING ROOM	ROMZEE	SERVICEABLE	¥167,000.-	深井専門家携行機材 (本邦購送)
207	HYDROMETER 7/pcs/set 16cm long	1 set	05/01/89 232- 98041484	SAND TESTING ROOM	ROMZEE	SERVICEABLE	¥32,000.-	平成2年度供与機材 (現地購送)
208	CARBONIC ACID GAS PRESSURE REGULATOR FCR803K 220V.	1 set	05/01/89 232- 98041484	SAND TESTING ROOM	ROMZEE	SERVICEABLE	¥37,500.-	深井専門家携行機材 (本邦購送)
209	MEASURING APPARATUS YAMATO YSD-30	1 set	05/01/89 232- 98041484	SAND TESTING ROOM	ROMZEE	SERVICEABLE	¥30,500.-	深井専門家携行機材 (本邦購送)
210	- ditto- YAMATO YSD-8	1 set	05/01/89 232- 98041484	SAND TESTING ROOM	ROMZEE	SERVICEABLE	¥12,800.-	深井専門家携行機材 (本邦購送)
211	MOULDING FLASK 580 X 460 X 250 X 250	3 set	30/03/91	MOULDING SECTION	ROMZEE	SERVICEABLE	¥\$12,000.-	平成2年度供与機材 (現地購送)

Equipment List / Foundry Group

R/D NO	NAME OF EQUIPMENT	QUANTITY	ARRIVAL	PLACE	IN CHARGE	CONDITION	PRICE	BUDGET
212	<u>MOULDING</u> ABRASIVE CUTTER NO 95 - C1800 - 400	1 unit	30/03/91	SAND TEST	ROMZEE	SERVICEABLE	¥19,825.-	平成2年度供与機材 (現地調達)
213	GREEN SAND CONVEYING SYSTEM	1 unit	26/10/91	MOULDING SECTION	ROMZEE	SERVICEABLE	¥92,000.-	平成2年度供与機材 (現地調達)
214	MOULDING FLASK 580 X 460 X 250 X 250	2 set	30/12/92	MOULDING SECTION	ROMZEE	SERVICEABLE	¥8,000.-	平成3年度供与機材 (現地調達)

W/C

Equipment List / Foundry Group

R/D NO	NAME OF EQUIPMENT	QUANTITY	ARRIVAL	PLACE	IN CHARGE	CONDITION	PRICE	BUDGET
3	CORE MAKING							
301	CORE BLOWING MACHINE (S80-3C) SUPPER BLOW	1 set	05/12/89 NPK - 002	MOULDING SECTION	ROMZEE	SERVICEABLE	¥3,200,000.-	昭和63年度供与器材 (本邦赠送)
302	SHELL MOULDING MACHINE TYPE. TD - 330	1 set	05/12/89 NPK - 002	MOULDING SECTION	ROMZEE	SERVICEABLE	¥6,200,000.-	昭和63年度供与器材 (本邦赠送)
303-1	CORE BOX FOR CORE BLOWING MACHINE	1 set	19/10/89	MOULDING SECTION	ROMZEE	SERVICEABLE	¥500,000.-	昭和63年度供与器材 (本邦赠送)
303-2	CORE BOX FOR SHELL CORE MACHINE	1 set	"	MOULDING SECTION	ROMZEE	SERVICEABLE	¥1,200,000.-	"
304	ELECTRIC HEATER SHELL MOULDING PROCESS	10 Pes	05/02/92	MOULDING SECTION	ROMZEE	SERVICEABLE	¥58,300.-	平成3年度供与器材 (本邦赠送)

WNL

Equipment List / Foundry Group

R/D NO	NAME OF EQUIPMENT	QUANTITY	ARRIVAL	PLACE	IN CHARGE	CONDITION	PRICE	BUDGET
4	SAND PREPARATION (CO ₂ & ORGANIC SAND)							
401	CO ₂ SELF - SETTING SAND PLANT BUCKET ELEVATOR (WITH GRATE HOPPER)	1 set	06/12/89 NPK - 002	MOULDING SECTION	ROMZEE	SERVICEABLE	¥18,200,000.-	昭和63年度供与機材 (本邦勝送)
402	SAND HOPPER (WITH BELT CONVEYER)	1 set	06/12/89 NPK - 002	MOULDING SECTION	ROMZEE	SERVICEABLE	"	"
403	MIXER CONTROL PANEL	1 set	06/12/89 NPK - 002	MOULDING SECTION	ROMZEE	SERVICEABLE	"	"
404	DUST COLLECTOR	1 set	06/12/89 NPK - 002	MOULDING SECTION	ROMZEE	SERVICEABLE	"	"
	(GREEN SAND)							
405	GREEN SAND PLANT SHAKE OUT MACHINE (WITH 1000)	1 set	06/12/89 NPK - 002	MOULDING SECTION	ROMZEE	SERVICEABLE	¥28,700,000.-	昭和63年度供与機材 (本邦勝送)
406	BELT CONVEYER (WITH MAGNET PULLEY AND MAGNET SEPARATOR)	1 set	06/12/89 NPK - 002	MOULDING SECTION	ROMZEE	SERVICEABLE	"	"
407	BUCKET ELEVATOR	1 set	06/12/89 NPK - 002	MOULDING SECTION	ROMZEE	SERVICEABLE	"	"
408	SAND HOPPER BELT CONVEYER	1 set	06/12/89 NPK - 002	MOULDING SECTION	ROMZEE	SERVICEABLE	"	"
409	MIXER (WITH TURN CONVEYER) CONTROL PANEL	1 set	06/12/89 NPK - 002	MOULDING SECTION	ROMZEE	SERVICEABLE	"	"
410	DUST COLLECTOR ACCESSORY AND SPARE PARTS	1 set	06/12/89 NPK - 002	MOULDING SECTION	ROMZEE	SERVICEABLE	"	"
411	SAND DRYER	1 unit	15/01/90 YPK - 008	MOULDING SECTION	ROMZEE	SERVICEABLE	¥5,610,000.-	昭和63年度供与機材 (本邦勝送)
	POWER HEATER	1 unit	15/01/90 YPK - 008	MOULDING SECTION	ROMZEE	SERVICEABLE	¥10,340,000.-	"
	HOT AIR GENERATOR	1 unit	15/01/90 YPK - 008	MOULDING SECTION	ROMZEE	SERVICEABLE	¥6,190,000.-	"
	MAIN CONTROL BOX	1 unit	15/01/90 YPK - 008	MOULDING SECTION	ROMZEE	SERVICEABLE	¥4,430,000.-	"
	BAG FILTER	1 unit	15/01/90 YPK - 008	MOULDING SECTION	ROMZEE	SERVICEABLE	¥4,430,000.-	"
	SPARE PARTS	1 unit	15/01/90 YPK - 008	STOR	MOHD ARDULLAH	SERVICEABLE	"	"

CWC

Equipment List / Foundry Group

R/D NO	NAME OF EQUIPMENT	QUANTITY	ARRIVAL	PLACE	IN CHARGE	CONDITION	PRICE	BUDGET
5	<u>FINISHING</u>							
501	SHOT BLAST	1 set	06/12/89 NPK - 002	FINISHING SECTION	INAS	SERVICEABLE	¥8,000,000.-	昭和63年度供与機材 (本邦贈送)
502	DOUBLE HEAD GRINDER MODEL MNC - 20 Dia. 510 mm ROTATION : 1,900 rpm POWER SOURCE : 415V/3ph/50HZ DUST COLLECTOR FOR DOUBLE HEADS GRINDER	1 set	12/08/89 YPK - 08	FINISHING SECTION	INAS	SERVICEABLE	¥3,550,000.-	昭和63年度供与機材 (本邦贈送)
503	VERTICAL BANDSAWING MACHINE VN - 1200	1 set	30/03/91 YPK - 21	FINISHING SECTION	INAS	SERVICEABLE	¥3,526,340.-	平成2年度供与機材 (本邦贈送)
504	1 CIRCULAR TABLE DAIWA KOKI TCT - 300	1 set	15/10/90 232-8102 1835	FINISHING SECTION	INAS	SERVICEABLE	¥ 828,700.-	小谷専門家携行機材
505	SURFACE GAUGE Y18-430 Y18-434 Y18-442 Y18-444 Y18-446	1 PCE 1 PCE 1 PCE 1 PCE 1 PCE	15/10/90 232 8102 1835	FINISHING SECTION	INAS	SERVICEABLE	2,800.- 4,000.- 11,000.- 15,300.- 31,200.-	小谷専門家携行機材
	CIRCULAR CALIPER Y18-486 Y18-490 Y18-566	1 PCE 1 PCE 1 PCE					780.- 1,950.- 1,100.-	
	PADDING CALIPERS Y18-541 Y18-543	1 PCE 1 PCE					1,600.- 1,100.-	
	COMPASS WITH SPRING Y18-566 Y18-568	1 PCE 1 PCE					2,400.- 1,100.-	
	THICKNESS GAUGE 172-ME	2 PSC	"	"	"	"	1,600.-	"
	SCALE Y07-004 Y07-003 Y07-001	2 PSC 2 PSC 6 PSC					3,920.- 4,560.- 2,400.-	
	VERNIER CALIPERS "MITUTOYO" N-60	1 PCE					1,820.-	
	HOLDER "RIKEN" B-3	2 PCS					40,560.-	
	SQUARE "RIKEN" Y11-380	1 PCE					58,200.-	
	SQUARE WITH STAND 300mm.	1 PCE					14,100.-	
	DIAL CALIPER "PEACOCK" LO-8	1 PCE					20,600.-	

MNC

Equipment List / Foundry Group

R/D NO	NAME OF EQUIPMENT	QUANTITY	ARRIVAL	PLACE	IN CHARGE	CONDITION	PRICE	BUDGET
505	DIAL CALIPER GAUGE "PEACOCK" LO-2	1 PCE	15/10/90 232	FINISHING SECTION	INAS	SERVICEABLE	53,500.- 53,000.-	小台専門家携行機材
	WHITE SPRAY	24 PCS	8102 1835				¥ 18,240.-	
	HAMMER "OH" HK02	2 PCS					1,740.-	
	RADIUS GAUGE "FUJI TOOL" 178A	1 PCE					3,050.-	
	" " " " 178MB	1 PCE					3,480.-	
	" " " " 178NC	1 PCE					9,580.-	
	" " " " 178ND	1 PCE					11,700.-	
	CENTER JACK "GOLD JAGER" CJ-7	6 PSC					9,120.-	
	" " " " CJ-8	6 PSC					11,760.-	
	" " " " CJ-9	6 PSC					14,340.-	
	" " " " CJ-10	6 PSC					16,200.-	
	" " " " CJ-11	6 PSC					21,540.-	
	" " " " CJ-12	6 PSC					26,760.-	
	PARTING SAND 30KGS	1 PCE	"	"	"	"	3,040.-	"
	CB TEST PIECE TUBE	1 PCE					72,800.-	
	PIN BUSH GAUGE NO.1-4	4 PSC					56,000.-	
	SPATULA	2 PCS					5,000.-	
	GATE TRUMPET 40 x 230	1 PCE					12,000.-	
	GATE MODEL	6 PCS					40,440.-	
	RUNNER GAUGE	1 PCE					51,000.-	
	RUNNER MAKING ALUMINIUM 3KGS	1 PCE					4,770.-	
506	WILSON DEEP THROAT BRINELL TESTER AP-24-24	1 SET	-	-	-	-	¥ 49,818.-	平成4年度供与機材 (現地調達)

M/L

Equipment List / Foundry Group

R/D NO	NAME OF EQUIPMENT	QUANTITY	ARRIVAL	PLACE	IN CHARGE	CONDITION	PRICE	BUDGET
601	AIR COMPRESSOR etc AIR COMPRESSOR, MODEL KST15A - 5C ACTUAL DISCHARGE AIR VOLUME 2.4 m ³ /min. POWER SOURCE : 415V/3ph/50Hz	1 set	12/08/89 YPK - 08	OUT SIDE FOUNDRY	FAUZI	SERVICEABLE	¥2,540,000.-	昭和63年度供与機材 (本邦贈送)
602	GENERATOR MODEL : DCA-45SPI	1 set	24/05/89 YPK - 15	OUT SIDE FOUNDRY	FAUZI	SERVICEABLE	¥2,036,000.-	昭和63年度供与機材 (本邦贈送)

WNC

Equipment List / Foundry Group

R/D NO	NAME OF EQUIPMENT	QUANTITY	ARRIVAL	PLACE	IN CHARGE	CONDITION	PRICE	BUDGET
701 18	STANDARD SAMPLE CTIF01-FT-3	28 pcs	10/11/89 KPK - 24	X-RAY ROOM	LEE	SERVICEABLE	¥116,200.-	昭和63年度供与機材 (本邦贈送)
19	AUTO TRANSFORMER 10KV1 φ	1 set	10/11/89 KPK - 24	X-RAY ROOM	LEE	SERVICEABLE	¥87,800.-	昭和63年度供与機材 (本邦贈送)
20	AUTO TRANSFORMER 5KV3 φ	1 set	10/11/89 KPK - 24	X-RAY ROOM	LEE	SERVICEABLE	¥140,500.-	昭和63年度供与機材 (本邦贈送)
21	AUTO-TRANSFORMER 10KV3 φ	1 set	10/11/89 KPK - 24	X-RAY ROOM	LEE	SERVICEABLE	¥191,500.-	昭和63年度供与機材 (本邦贈送)
22	SPARE AND CONSUMABLE PARTS	1 set (170 pcs)	10/11/89 KPK - 24	X-RAY ROOM	LEE	SERVICEABLE	¥804,500.-	昭和63年度供与機材 (本邦贈送)
23	SAMPLE CUTTER WITH DUST COLLECTING SYSTEM	1 set	10/11/89 KPK - 24	X-RAY ROOM	LEE	SERVICEABLE	¥588,500.-	昭和63年度供与機材 (本邦贈送)
24	VIBRATION MILL WITH TUNGSTEN CARBIDE VESSEL	1 set	10/11/89 KPK - 24	X-RAY ROOM	LEE	SERVICEABLE	¥2,807,000.-	昭和63年度供与機材 (本邦贈送)
25	AUTOMATIC HYDRAULIC PRESS 50 TON	1 set	10/11/89 KPK - 24	X-RAY ROOM	LEE	SERVICEABLE	¥1,595,000.-	昭和63年度供与機材 (本邦贈送)
26	DUST COLLECTING MACHINE	1 set	10/11/89 KPK - 24	X-RAY ROOM	LEE	SERVICEABLE	¥840,500.-	昭和63年度供与機材 (本邦贈送)
27	AIR COOLING SYSTEM HEAT EXCHANGER	1 set	10/11/89 KPK - 24	X-RAY ROOM	LEE	SERVICEABLE	¥1,448,000.-	昭和63年度供与機材 (本邦贈送)
28	DOUBLE HEAD SYSTEM BELT GRINDER	1 set	10/11/89 KPK - 24	X-RAY ROOM	LEE	SERVICEABLE	¥420,300.-	昭和63年度供与機材 (本邦贈送)
29	SAMPLE GRINDER WITH DRESSER AND GRINDING WHEEL	1 set	10/11/89 KPK - 24	X-RAY ROOM	LEE	SERVICEABLE	¥554,000.-	昭和63年度供与機材 (本邦贈送)
30	FLEXIBLE PIPE	1 set	10/11/89 KPK - 24	X-RAY ROOM	LEE	SERVICEABLE	¥326,900.-	昭和63年度供与機材 (本邦贈送)
31	PR GAS CYLINDER	1 set	10/11/89 KPK - 24	X-RAY ROOM	LEE	SERVICEABLE	¥176,000.-	昭和63年度供与機材 (本邦贈送)
32	SPARE PARTS - AUTOMATIC X-RAY SPECTROMETER SYSTEM 3070E/S	147 sets	10/11/89 KPK - 24	X-RAY ROOM	LEE	SERVICEABLE	¥398,210.-	昭和63年度供与機材 (本邦贈送)
33	AIR COOLING TYPE HEAT EXCHANGER (4838B1)	9 pcs	10/11/89 KPK - 24	X-RAY ROOM	LEE	SERVICEABLE	¥271,070.-	昭和63年度供与機材 (本邦贈送)
34	AUTOMATIC X-RAY SPECTROMETER SYSTEM 3070E/S	14 pcs	10/11/89 KPK - 24	X-RAY ROOM	LEE	SERVICEABLE	¥135,220.-	昭和63年度供与機材 (本邦贈送)

M/C

Equipment List / Foundry Group

R/D NO	NAME OF EQUIPMENT	QUANTITY	ARRIVAL	PLACE	IN CHARGE	CONDITION	PRICE	BUDGET
702	CARBON SULFUR DETERMINATOR MODEL : CS - 244	1 set	12/08/89 YPK - 08	X-RAY ROOM	LEE	SERVICEABLE	¥13,462,120.-	昭和63年度供与機材 (本邦購送)
2	VOLTAGE REGULATOR (5KVA)	1 set	12/08/89 YPK - 08	X-RAY ROOM	LEE	SERVICEABLE	¥230,000.-	昭和63年度供与機材 (本邦購送)
3	TRANSFORMER (5KVA)	1 set	12/08/89 YPK - 08	X-RAY ROOM	LEE	SERVICEABLE	¥140,000.-	昭和63年度供与機材 (本邦購送)
4	OXYGEN REGULATOR	1 set	12/08/89 YPK - 08	X-RAY ROOM	LEE	SERVICEABLE	¥30,000.-	昭和63年度供与機材 (本邦購送)
5	NITROGEN REGULATOR	1 set	12/08/89 YPK - 08	X-RAY ROOM	LEE	SERVICEABLE	¥30,000.-	昭和63年度供与機材 (本邦購送)
6	CONSUMABLES PARTS	8 boxes 198 pcs	12/08/89 YPK - 08	X-RAY ROOM	LEE	SERVICEABLE	¥2,196,280.-	昭和63年度供与機材 (本邦購送)
703	AUTOMATIC VOLTAGE REGULATOR	1 set	20/09/89	X-RAY ROOM	LEE	SERVICEABLE	¥11,000.-	昭和63年度供与機材 (現地購送)
704	MBH SPECTROSCOPIC REFERENCE MATERIALS	63 pcs	23/08/91	X-RAY ROOM	LEE	SERVICEABLE	¥35,276.-	平成2年度供与機材 (現地購送)
-1	L-08852-36 ULTRASONIC CLEANER WITH HEATER	1 set	23/08/91	X-RAY ROOM	LEE	SERVICEABLE	¥4,196.-	
-2	L-08852-41 INSERT TRAY (SOLID)	1 set	23/08/91	X-RAY ROOM	LEE	SERVICEABLE	¥324.-	
-3	L-08852-42 INSERT TRAY (PERFORATED)	1 set	23/08/91	X-RAY ROOM	LEE	SERVICEABLE	¥343.-	
-4	L-08852-43 BEAKER HOLDER	1 set	23/08/91	X-RAY ROOM	LEE	SERVICEABLE	¥133.-	
-5	L-08897-10 VERTICAL ACRYLIC DESSICATOR	1 set	23/08/91	X-RAY ROOM	LEE	SERVICEABLE	¥2,516.-	
705	FUSE XRF 3070 BILC-0.5A (2pcs), BILC-1.0A (2pcs) BILC-2.0A (2pcs), BILC-3.0A (2pcs) BILC-1.0A (2pcs), BLA0-6.0A (2pcs)	1 set	12/01/91	X-RAY ROOM	LEE	SERVICEABLE	¥2,040.-	平成2年度供与機材 (本邦購送)
706	XRF USE STANDARD SAMPLE ORE CLAY NO.2 R-602 50gs	2 pcs	05/03/91 232-8196- 5586	X-RAY ROOM	LEE	SERVICEABLE	¥10,300.-	平成2年度供与機材 (本邦購送)
2	CLAY NO.3 R-603 50gs	2 pcs	05/03/91	X-RAY ROOM	LEE	SERVICEABLE	¥10,300.-	
3	GLASS USE KEISA R-403 80gs	2 pcs	05/03/91	X-RAY ROOM	LEE	SERVICEABLE	¥10,300.-	
4	FELDSPAR R-701 50gs	2 pcs	05/03/91	X-RAY ROOM	LEE	SERVICEABLE	¥10,300.-	
5	BRICK JRRM 102 20gs	4 pcs	05/03/91	X-RAY ROOM	LEE	SERVICEABLE	¥41,200.-	

MVC

Equipment List / Foundry Group

R/D NO	NAME OF EQUIPMENT	QUANTITY	ARRIVAL	PLACE	IN CHARGE	CONDITION	PRICE	BUDGET
7								
706	6 BRICK JRRM 104 20 gs	4 pcs	05/03/91 232-8196 -5586	X-RAY ROOM	LEE	SERVICEABLE	¥41,200.00	平成2年度供与機材 (奔放贈送)
7	BRICK JRRM 105 20 gs	4 pcs		X-RAY ROOM	LEE	SERVICEABLE	¥41,200.00	
8	BRICK JRRM 106 20 gs	4 pcs		X-RAY ROOM	LEE	SERVICEABLE	¥41,200.00	
9	SILICA JRRM 201 20 gs	4 pcs	"	X-RAY ROOM	LEE	SERVICEABLE	¥41,200.00	"
10	SILICA JRRM 205 20gs	4 pcs		X-RAY ROOM	LEE	SERVICEABLE	¥41,200.00	
11	SILICA JRRM 208 20gs	4 pcs		X-RAY ROOM	LEE	SERVICEABLE	¥41,200.00	
12	SILICA JRRM 210 20gs	4 pcs		X-RAY ROOM	LEE	SERVICEABLE	¥41,200.00	
707	1 31X TB 1-4 TRACE E. IN BRASS	4 pcs	23/08/91	X-RAY ROOM	LEE	SERVICEABLE	¥3,080.00	平成3年度供与機材 (現地調達)
2	31X WSB 1-6 SILICON BRASS	6 pcs	23/08/91	X-RAY ROOM	LEE	SERVICEABLE	¥5,040.00	
3	54XG25D 1-D5 AL/SI	5 pcs	23/08/91	X-RAY ROOM	LEE	SERVICEABLE	¥2,205.00	
4	54XG06H 1-H5 AL/SI	5 pcs	23/08/91	X-RAY ROOM	LEE	SERVICEABLE	¥2,205.00	
5	54XG13H 1-H5 AL/SI	5 pcs	23/08/91	X-RAY ROOM	LEE	SERVICEABLE	¥2,205.00	
6	55XG000J1-J5 AL/SI/Cu	5 pcs	23/08/91	X-RAY ROOM	LEE	SERVICEABLE	¥2,205.00	
7	55XG04H1-13-H4 AL/SI/Cu	3 pcs	23/08/91	X-RAY ROOM	LEE	SERVICEABLE	¥1,323.00	
8	55XG26HJ-H5 AL/SI/Cu	5 pcs	23/08/91	X-RAY ROOM	LEE	SERVICEABLE	¥2,205.00	
9	55XG02D6-D10 AL/SI/Ch	5 pcs	23/08/91	X-RAY ROOM	LEE	SERVICEABLE	¥2,205.00	
10	56X G14H1-H5 AL/Cu	5 pcs	23/06/91	X-RAY ROOM	LEE	SERVICEABLE	¥2,205.00	"
11	32X PB1 PHOSPHOR BRONZE	1 pcs	23/08/91	X-RAY ROOM	LEE	SERVICEABLE	¥5840.00	
12	32X PB2 PHOSPHOR BRONZE	1 pcs	23/08/91	X-RAY ROOM	LEE	SERVICEABLE	¥5840.00	
13	32X PB5 PHOSPHOR BRONZE	1 pcs	23/08/91	X-RAY ROOM	LEE	SERVICEABLE	¥5840.00	
14	32X LB1 LEADED BRONZE	1 pcs	23/08/91	X-RAY ROOM	LEE	SERVICEABLE	¥5840.00	
15	32X LB2 LEADED BRONZE	1 pcs	23/08/91	X-RAY ROOM	LEE	SERVICEABLE	¥5840.00	
16	32X LB3 LEADED BRONZE	1 pcs	23/08/91	X-RAY ROOM	LEE	SERVICEABLE	¥5840.00	
17	32X ALB1 ALUMINIUM BRONZE	1 pcs	23/08/91	X-RAY ROOM	LEE	SERVICEABLE	¥5840.00	
18	32X ALB2 ALUMINIUM BRONZE	1 pcs	23/08/91	X-RAY ROOM	LEE	SERVICEABLE	¥5840.00	

Equipment List / Foundry Group

R/D NO	NAME OF EQUIPMENT	QUANTITY	ARRIVAL	PLACE	IN CHARGE	CONDITION	PRICE	BUDGET
707 19	32X ALB6 ALUMINIUM BRONZE	1 pcs	23/08/91	X-RAY ROOM	LEE	SERVICEABLE	M\$840.00	平成3年度供与機材 (現地調達)
20	32A UE15 BRONZES	1 pcs	23/08/91	X-RAY ROOM	LEE	SERVICEABLE	M\$840.00	"
21	32A UE40 BRONZES	1 pcs	23/08/91	X-RAY ROOM	LEE	SERVICEABLE	M\$840.00	"
22	41X Z2-Z5 PURE ZINC	4 pcs	23/08/91	X-RAY ROOM	LEE	SERVICEABLE	M\$2,250.00	"
708 1	SAMPLE HOLDER RIGAKU 3380A	6 pcs	02/06/92	X-RAY ROOM	LEE	SERVICEABLE	¥221,400.00	平成3年度供与機材 (本邦調達)
2	SAMPLE HOLDER RIGAKU (MASK) 3336S7	6 pcs	02/06/92	X-RAY ROOM	LEE	SERVICEABLE	¥60,000.00	"
3	SAMPLE HOLDER RIGAKU (MASK) 3336S6	6 pcs	02/06/92	X-RAY ROOM	LEE	SERVICEABLE	¥60,000.00	"
4	RING RIGAKU 3481N FOR POWDER SAMPLE	1 set	02/06/92	X-RAY ROOM	LEE	SERVICEABLE	¥51,000.00	"
709 1	54X G23H1-H4 AL/SI	4 pcs	29/09/92	X-RAY ROOM	LEE	SERVICEABLE	M\$2,036.00	平成4年度供与機材 (現地調達)
2	56X G11H1E-5E AL/Cu	5 pcs	29/09/92	X-RAY ROOM	LEE	SERVICEABLE	M\$2,546.00	"
3	511X G05H1-H5 AL/Mg	5 pcs	29/09/92	X-RAY ROOM	LEE	SERVICEABLE	M\$2,546.00	"
4	511X G10H1-H5E AL/Mg	5 pcs	29/09/92	X-RAY ROOM	LEE	SERVICEABLE	M\$2,546.00	"
710 1	C2423, C2423a C2424, C2424a C2425, C2425a DS2 φ E.F.G.K.P.R.W	5 pcs	12/11/92	X-RAY ROOM	LEE	SERVICEABLE	M\$15,787.00	平成4年度供与機材 (現地調達)
711 1	31X WNB1-6 MANGANESE BRONZE	7 pcs	12/11/92	X-RAY ROOM	LEE	SERVICEABLE	M\$5,615.00	平成4年度供与機材 (現地調達)
2	32X PR3 & PD4 PHOSPHOR BRONZE	6 pcs	17/12/92	X-RAY ROOM	LEE	SERVICEABLE	M\$4,788.00	"
3	32N C51.11-14 ALUMINIUM BRONZE	2 pcs	17/12/92	X-RAY ROOM	LEE	SERVICEABLE	M\$1,596.00	"
4	33X GM4-7 ALUMINIUM BRONZE	4 pcs	17/12/92	X-RAY ROOM	LEE	SERVICEABLE	M\$4,008.00	"
712	STRUERS PRESTOPRESS-3	4 pcs	17/12/92	X-RAY ROOM	LEE	SERVICEABLE	M\$2,772.00	平成4年度供与機材 (現地調達)
		1 unit	05/01/93	X-RAY ROOM	LEE	SERVICEABLE	M\$15,073.00	平成4年度供与機材 (現地調達)

WMC

Equipment List / Foundry Group

R/D NO	NAME OF EQUIPMENT	QUANTITY	ARRIVAL	PLACE	IN CHARGE	CONDITION	PRICE	BUDGET
801	PHYSICAL TEST CE METER MODEL : EH100-01 WITH STANDARD ACCESSORY PAPER TRANSFORMER SI CUP G W LOT 200 200	1 unit	24/05/89 YPK - 15	MELTING SECTION	ROSMAN	SERVICEABLE	¥1,323,000.-	昭和63年度供与機材 (本邦贈送)
802	THERMOMETER MODEL : NSP - 203 (R) WITH STANDARD ACCESSORY	1 set	24/05/89 YPK - 15	MELTING SECTION	ROSMAN	SERVICEABLE	¥373,000.-	昭和63年度供与機材 (本邦贈送)
803	AL FAITH GAS ANALYSER MODEL : DP-MK II WITH STANDARD ACCESSORY	1 set	24/05/89 YPK - 15	X-RAY ROOM	LEE	SERVICEABLE	¥4,156,000.-	昭和63年度供与機材 (本邦贈送)
804	DIGITAL THERMOMETER	1 set	31/03/89	MELTING SECTION	ROSMAN	SERVICEABLE	¥294,000.-	正本球門家携行機材 (本邦贈送)
805	ULTRASONIC DETECTOR MODEL : ND - JESTER - QTA	1 set	02/01/91 YPR - 04	X-RAY ROOM	LEE	SERVICEABLE	¥2,744,000.-	昭和63年度供与機材 (本邦贈送)
806	OLYMPUS INVERTED METALLURGICAL MICROSCOPE PEH 3 - 313 UN	1 Unit	25/03/91	X-RAY ROOM	LEE	SERVICEABLE	¥556,847.50 -	平成 2年度供与機材 (現地贈送)
807	DIGITAL THERMOMETER NSP 203 (R) W / TRANS	1 Set	06/02/92	MELTING SECTION	ROSMAN	SERVICEABLE	¥380,000.-	平成 3年度供与機材 (本邦贈送)

MNC

Equipment List / Foundry Group

R/D NO	NAME OF EQUIPMENT	QUANTITY	ARRIVAL	PLACE	IN CHARGE	CONDITION	PRICE	BUDGET
9	SAND TEST							
901	SINTO-SIMPSON LABORATORY MIX-KULLER MODEL NSF-0L	1 set	19/10/89 YPK - 16	SAND TEST	ROMZEE	SERVICEABLE	¥1,320,000.-	昭和63年度供与機材 (本邦贈送)
902	MIXER MODEL MSU-1	1 set	19/10/89 YPK - 16	SAND TEST	ROMZEE	SERVICEABLE	¥2,340,000.-	昭和63年度供与機材 (本邦贈送)
903	SAND RAMMER FOR SAND SPECIMEN MODEL SR	1 set	19/10/89 YPK - 16	SAND TEST	ROMZEE	SERVICEABLE	¥203,600.-	昭和63年度供与機材 (本邦贈送)
904	RO-TAP SIEVE SHAKER MODEL SS WITH SAND TESTING SIEVES MODEL STS	1 set	19/10/89 YPK - 16	SAND TEST	ROMZEE	SERVICEABLE	¥814,000.-	昭和63年度供与機材 (本邦贈送)
905	ROTATING SAND WASHER MODEL SW	1 set	19/10/89 YPK - 16	SAND TEST	ROMZEE	SERVICEABLE	¥203,600.-	昭和63年度供与機材 (本邦贈送)
906	PERMEABILITY TESTER MODEL PT	1 set	19/10/89 YPK - 16	SAND TEST	ROMZEE	SERVICEABLE	¥305,000.-	昭和63年度供与機材 (本邦贈送)
907	MOTOR-DRIVEN UNIVERSAL SAND STRENGTH MACHINE MODEL US-M WITH US-A	1 set	19/10/89 YPK - 16	SAND TEST	ROMZEE	SERVICEABLE	¥1,015,000.-	昭和63年度供与機材 (本邦贈送)
908	INFRARED MOISTURE METER MODEL F-2B	1 set	19/10/89 YPK - 16	SAND TEST	ROMZEE	SERVICEABLE	¥407,200.-	昭和63年度供与機材 (本邦贈送)
909	GREEN HARDNESS TESTER & SCALE 473	1 set	19/10/89 YPK - 16	SAND TEST	ROMZEE	SERVICEABLE	¥78,300.-	昭和63年度供与機材 (本邦贈送)
910	CORE HARDNESS TESTER NO. 674	1 set	19/10/89 YPK - 16	SAND TEST	ROMZEE	SERVICEABLE	¥132,700.-	昭和63年度供与機材 (本邦贈送)
911	METHYLENE BLUE CLAY TESTER NO. 535-A WITH ULTRASONIC METHYLENE BLUE ACCESSORY NO. 536 AND PH METER	1 set	19/10/89 YPK - 16	SAND TEST	ROMZEE	SERVICEABLE	¥712,600.-	昭和63年度供与機材 (本邦贈送)
912	MOULDABILITY TESTER WITH TRANSFORMER, TRAY, BRUSH & SIEVE	1 unit	12/08/89 YPK - 08	SAND TEST	ROMZEE	SERVICEABLE	¥1,420,000.-	昭和63年度供与機材 (本邦贈送)
913	SAND SURFACE TESTING APPARATUS MODEL : POF	1 unit	12/08/89 YPK - 08	SAND TEST	ROMZEE	SERVICEABLE	¥1,115,000.-	昭和63年度供与機材 (本邦贈送)
914	CONTACTABILITY MODEL : NS-CBT-2 WITH STANDARD ACCESSARY	1 set	24/05/89 YPK - 15	SAND TEST	ROMZEE	SERVICEABLE	¥1,015,000.-	昭和63年度供与機材 (本邦贈送)
915	UNIVERSAL STRENGTH MACHINE MODEL : PFG HIGH PRESSURE GAUGE BREAK JIG	1 unit	12/08/89 YPK - 08	SAND TEST	ROMZEE	SERVICEABLE	¥1,422,000.-	昭和63年度供与機材 (本邦贈送)
916	BALANCE MODEL : FR-300 WITH STANDARD ACCESSARY	1 set	24/05/89 YPK - 15	SAND TEST	ROMZEE	SERVICEABLE	¥509,000.-	昭和63年度供与機材 (本邦贈送)

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R/D NO	NAME OF EQUIPMENT	QUANTITY	ARRIVAL	PLACE	INCHARGE	CONDITION	PRICE	BUDGET
917	DRYING OVEN, MODEL : DX-41	1 set	12/08/89 YPK - 08	SAND TEST	ROMZEE	SERVICEABLE	¥124,200.-	昭和63年度供与機材 (本邦購送)
918	MUFFLE FURNACE FOR ELECTRIC OVEN	1 set	19/10/89 YPK - 16	SAND TEST	ROMZEE	SERVICEABLE	¥407,000.-	昭和63年度供与機材 (本邦購送)
919	CO ₂ - GASSING CONTROLLER MODEL : FBC	1 set	12/08/89 YPK - 08	SAND TEST	ROMZEE	SERVICEABLE	¥203,600.-	昭和63年度供与機材 (本邦購送)
920	SURFACE THERMOMETER ANRITSU KEIKI HI-200	1 set	05/01/90 232- 98041484	SAND TEST	ROMZEE	SERVICEABLE	¥85,000.-	深井専門家携行機材 (本邦購送)
	SENSOR FOR ABOVE UT- M300 COND 2 MTS. TYPE K	1 set	98041484	SAND TEST	ROMZEE	SERVICEABLE	¥36,800.-	深井専門家携行機材 (本邦購送)
	-DITTO- BS-2 COND 2 MTS. TYPE K	1 set	"	SAND TEST	ROMZEE	SERVICEABLE	¥22,400.-	深井専門家携行機材 (本邦購送)
921	HYDROMETER 7 pcs/set. 16cm. long.	1 set	05/01/90 232- 98041484	SAND TEST	ROMZEE	SERVICEABLE	¥32,000.-	深井専門家携行機材 (本邦購送)
922	BALANCE MS-500	1 set	05/01/90 232- 98041484	SAND TEST	ROMZEE	SERVICEABLE	¥37,000.-	深井専門家携行機材 (本邦購送)
923	ANALYSER	1 set	05/01/90 232- 98041484	SAND TEST	ROMZEE	SERVICEABLE	¥131,100.-	深井専門家携行機材 (本邦購送)
924	MAGNETIC STIRRERS, BATTERY TYPE 0 - 500ml. 50 - 1,000 rpm	1 set	05/01/90 232- 98041484	SAND TEST	ROMZEE	SERVICEABLE	¥35,700.-	深井専門家携行機材 (本邦購送)
925	ROTOR TEFLOW 40mm.	1 set	05/01/90 232- 98041484	SAND TEST	ROMZEE	SERVICEABLE	¥1,380.-	深井専門家携行機材 (本邦購送)
926	CASTING INTENSITY METER	1 set	08/08/90	SAND TEST	ROMZEE	SERVICEABLE	¥232,000.-	深井専門家携行機材 (本邦購送)
927	PYRAMID SURFACE PLATE, STAND	1 set	20/03/91	SAND TEST	ROMZEE	SERVICEABLE	¥13,850.-	平成2年度供与機材 (現地調達)
928	STEREO MICROSCOPE PHOTOGRAPHY	1 set 1 set	27/03/91	SAND TEST	ROMZEE	SERVICEABLE	¥4,140.- ¥5,220.-	平成2年度供与機材 (現地調達)

MAC

Equipment List / Foundry Group

R/D NO	NAME OF EQUIPMENT	QUANTITY	ARRIVAL	PLACE	IN CHARGE	CONDITION	PRICE	BUDGET
929	TRANSVERSE STRENGTH CORE BOX TYPE PBK	1 set	30/03/91	SAND TEST	RONZEE	SERVICEABLE	M\$ 7,130.-	平成2年度供与機材 (現地調達)
	VOLATILES APPARATUS TYPE PBA	1 set	30/03/91	SAND TEST	RONZEE	SERVICEABLE	M\$ 2,684.-	"
930	95-C4200-250 SPECIMEN DRYER	1 unit	30/03/91	SAND TEST	RONZEE	SERVICEABLE	M\$ 2,540.-	平成2年度供与機材 (現地調達)
	95-C2241-250 METASERVE GRINDER	1 unit	30/03/91	SAND TEST	RONZEE	SERVICEABLE	M\$ 3,600.-	"
	95-C2441-250 METASERVE UNIVERSAL POLISHER	1 unit	30/03/91	SAND TEST	RONZEE	SERVICEABLE	M\$ 3,450.-	"
931	GEORGE FISHER HIGH-DRY COMPRESSIVE STRENGTH ATTACHMENT	1 unit	23/03/91	SAND TEST	RONZEE	SERVICEABLE	M\$12,450.-	平成3年度供与機材 (現地調達)
932	SILICA TUBE	1 unit	23/03/91	SAND TEST	RONZEE	SERVICEABLE	M\$ 3,436.-	平成3年度供与機材 (現地調達)
	COPPER SAMPLES	12 pcs	23/03/91	SAND TEST	RONZEE	SERVICEABLE	M\$ 150.-	"
	3/4 COMBINED FILTER, REGULATOR + LUBRICATOR C/W GAUGE + ADAPTORS, VANGUARD MODEL CFRL 103-5	2 sets	23/03/91	SAND TEST	RONZEE	SERVICEABLE	M\$ 927.-	"
933	ELECTRIC BALANCE METTLER PJ 3000 (220V)	1 set	18/07/91	SAND TEST	RONZEE	SERVICEABLE	¥ 158,000.-	太陽硝子家務行機材
	DIGITAL THERMO METER YEW NO.2455-16	1 pcs	18/07/91	SAND TEST	RONZEE	SERVICEABLE	¥ 42,500.-	"
934	GAS PRESSURE DETERMINATOR MODEL : PGD	1 set	02/01/91	SAND TEST	RONZEE	SERVICEABLE	¥ 3,996,960.-	深井硝子家務行機材
935	L-08852-36 ULTRASONIC CLEANER WITH HEATER TIMER	1 unit	23/03/91	SAND TEST	RONZEE	SERVICEABLE	M\$ 4,196.-	平成3年度供与機材 (現地調達)
	L-08852-41 INSERT TRAY (SOLID)	1 unit	23/03/91	SAND TEST	RONZEE	SERVICEABLE	M\$ 324.-	"
	L-08852-42 INSERT TRAY (PERFORATED)	1 unit	23/03/91	SAND TEST	RONZEE	SERVICEABLE	M\$ 343.-	"
	L-08852-43 BEAKER HOLDER	1 unit	23/03/91	SAND TEST	RONZEE	SERVICEABLE	M\$ 133.-	"
	L-08790-20 1 x 5 gal. MICRO CLEANING SOLUTION	1 unit	23/03/91	SAND TEST	RONZEE	SERVICEABLE	M\$ 408.-	"
	L-08897-10 VERTICAL ACRYLIC DESSICATOR	1 unit	23/03/91	SAND TEST	RONZEE	SERVICEABLE	M\$ 2,196.-	"
	POLAROID FILM (TYPE 665)	1 unit	23/03/91	SAND TEST	RONZEE	SERVICEABLE	M\$ 30.-	"

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R/D NO	NAME OF EQUIPMENT	QUANTITY	ARRIVAL	PLACE	IN CHARGE	CONDITION	PRICE	BUDGET
935	3/4" COMBINED FILTER, REGULATOR + LUBRICATOR C/W GAUGE + ADAPTORS, VANGUARD MODEL 108-6	1 unit	23/08/90	SAND TEST	ROMZEE	SERVICEABLE	¥5,492.00	平成3年度供与機材 (現地調達)
936	3/4" FILTER, REGULATOR + LUBRICATOR C/W GAUGE + ADAPTOR, VANGUARD MODEL PRL 100-6 BRUSH 5 - 250mesh GLASS BOTTLE SINTO SW USE INFRARED LAMP - KEIT INFRARED MOISTURE F-28 USE	1 unit 2 sets 4 pcs 6 pcs	23/08/90 06/02/92 06/02/92 06/02/92	SAND TEST SAND TEST SAND TEST SAND TEST	ROMZEE ROMZEE ROMZEE ROMZEE	SERVICEABLE SERVICEABLE SERVICEABLE SERVICEABLE	¥5,480.00 ¥73,000.00 ¥126,200.00 ¥26,400.00	" 平成3年度供与機材 (本邦調達) "

M/C

Equipment List / Foundry Group

R/D NO	NAME OF EQUIPMENT	QUANTITY	ARRIVAL	PLACE	IN CHARGE	CONDITION	PRICE	BUDGET
10	<u>PATTERN MAKING</u>							
1001	THICKNESS PLANNER MODEL : SX-632 MAKER : IIDA KOGYO CO. LTD.	1 set	19/10/89 YPK - 16	PATTERN MAKING ROOM	AZAIIZAM	SERVICEABLE	¥2,160,000.-	昭和63年度供与機材 (本邦購送)
1002	HAND FEED PLANNER MODEL : EJ-302 MAKER : IIDA KOGYO CO. LTD.	1 set	12/08/89 YPK - 08	PATTERN MAKING ROOM	AZAIIZAM	SERVICEABLE	¥710,000.-	昭和63年度供与機材 (本邦購送)
1003	BAND SAW MODEL : JRS-650 MAKER : JONAN SEISAKUSYO	1 set	24/05/89 YPK - 15	PATTERN MAKING ROOM	AZAIIZAM	SERVICEABLE	¥940,500.-	昭和63年度供与機材 (本邦購送)
1004	UNIVERSAL DRILLING MACHINE MODEL : EF-40 MAKER : YAMAMOTO CO. LTD.	1 set	12/08/89 YPK - 08	PATTERN MAKING ROOM	AZAIIZAM	SERVICEABLE	¥610,000.-	昭和63年度供与機材 (本邦購送)
1005	WOOD WORKING LATHE MODEL : TF-24 MAKER : FUJIKYU MACHINERY INDUSTRY	1 set	12/08/89 YPK - 08	PATTERN MAKING ROOM	AZAIIZAM	SERVICEABLE	¥2,590,000.-	昭和63年度供与機材 (本邦購送)
1006	WOOD WORKING TOOL GRINDER MODEL : TF MAKER : FUJIKYU MACHINERY INDUSTRY	1 set	12/08/89 YPK - 08	PATTERN MAKING ROOM	AZAIIZAM	SERVICEABLE	¥303,000.-	昭和63年度供与機材 (本邦購送)
1007	ELECTRIC PLANNER MODEL : P-40 MAKER : HITACHI KOKI CO. LTD.	1 set	12/08/89 YPK - 08	PATTERN MAKING ROOM	AZAIIZAM	SERVICEABLE	¥52,900.-	昭和63年度供与機材 (本邦購送)
	ELECTRIC DRILL MODEL : BU-SH3 MAKER : HITACHI KOKI CO. LTD.	1 set	12/08/89 YPK - 08	PATTERN MAKING ROOM	AZAIIZAM	SERVICEABLE	¥33,500.-	昭和63年度供与機材 (本邦購送)
	ELECTRIC JIG SAW MODEL : JH-60A MAKER : HITACHI KOKI CO. LTD.	1 set	12/08/89 YPK - 08	PATTERN MAKING ROOM	AZAIIZAM	SERVICEABLE	¥33,500.-	昭和63年度供与機材 (本邦購送)
	ELECTRIC ORBITAL SANDER MODEL : SY 12Y1 MAKER : HITACHI KOKI CO. LTD.	1 set	12/08/89 YPK - 08	PATTERN MAKING ROOM	AZAIIZAM	SERVICEABLE	¥40,200.-	昭和63年度供与機材 (本邦購送)
1008	DIAL COUNT HEIGHT GAGE MODEL : H-730N HEIGHT GAGE 1 MODEL : H-760	1 pc 1 pc	24/05/89 YPK - 15	PATTERN MAKING ROOM	AZAIIZAM	SERVICEABLE	¥50,900.- ¥114,000.-	昭和63年度供与機材 (本邦購送)
	ANGLE VISE W/SWIVEL BASE MODEL : P-400AS	1 pc	24/05/89 YPK - 15	PATTERN MAKING ROOM	AZAIIZAM	SERVICEABLE	¥50,900.-	昭和63年度供与機材 (本邦購送)
	BOX PARALLEL MODEL : RP15M SURFACE GAUGE MODEL : NY17-311 SURFACE GAUGE MODEL : NY17-313 SURFACE GAUGE MODEL : NY17-314	1 pc 1 pc 1 pc 1 pc	24/05/89 YPK - 15	PATTERN MAKING ROOM	AZAIIZAM	SERVICEABLE	¥30,500.- ¥4,500.- ¥4,500.- ¥4,500.-	昭和63年度供与機材 (本邦購送)

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R/D NO	NAME OF EQUIPMENT	QUANTITY	ARRIVAL	PLACE	IN CHARGE	CONDITION	PRICE	BUDGET
1008	VENNIER CALIPER MODEL : NE-20 VENNIER CALIPER MODEL : NE-30 STRAIGHT EDGE 1000mm SQUARE MODEL : OA-150 SQUARE MODEL : OA-300 STEEL RULER 300mm STEEL RULER 600mm	1 pc 1 pc 1 pc 1 pc	24/05/89 YPK - 15	PATTERN MAKING ROOM	AZNAIZAM	SERVICEABLE	¥12,800.- ¥12,800.-	昭和63年度供与様材 (本部赠送)
1009	JACK SCREW MODEL : NO.5 JACK SCREW MODEL : J45 SURFACE PLATE MODEL : OS-5060 SURFACE PLATE MODEL : OS-90180	1 pc 1 pc	24/05/89 YPK - 15	PATTERN MAKING ROOM	AZNAIZAM	SERVICEABLE	¥21,300.- ¥15,750.- ¥15,750.-	昭和63年度供与様材 (本部赠送)
1010	ROUTER MACHINE MODEL : RO-116	1 pc	24/05/89 YPK - 15	PATTERN MAKING ROOM	AZNAIZAM	SERVICEABLE	¥875.- ¥875.-	昭和63年度供与様材 (本部赠送)
1011	TILTS SAW APINKE TYPE CIRCULAR SAW BENCH MAKER : ISHIZU MANUFACTURING CO. LTD.	1 pc	24/05/89 YPK - 15	PATTERN MAKING ROOM	AZNAIZAM	SERVICEABLE	¥4,575.- ¥4,575.-	昭和63年度供与様材 (本部赠送)
1012	ELECTRIC BENCH GRINDER MODEL : AYT-4 WITH FLOOR STAND MAKER : HITACHI KOKI CO. LTD.	1 pc	24/05/89 YPK - 15	PATTERN MAKING ROOM	AZNAIZAM	SERVICEABLE	¥73,300.- ¥305,000.-	昭和63年度供与様材 (本部赠送)
1013	KNIFE GRINDER MODEL MODEL : JG-T60 MAKER : TAMEGAWA IRON CO. LTD.	1 unit	24/05/89 YPK - 15	PATTERN MAKING ROOM	AZNAIZAM	SERVICEABLE	¥1,015,000.-	昭和63年度供与様材 (本部赠送)
1014	CARPENTER TOOLS PLANE, BLADE SIZE : 3/4, FINISH PLANE, BLADE SIZE : 3/4, ROUGH PLANE, BLADE SIZE : 3/4, SMALL PLANE, BLADE SIZE : 3/4, LONG DOUBLE-EDGE WOOD SAW, LENGTH : 300mm DOUBLE-EDGE WOOD SAW, LENGTH : 240mm MINI PLANE, SIZE : 40mm MINI PLANE, SIZE : 30mm SIDE PLANE FOR LIGHT SIZE : 300mm SIDE PLANE FOR RIGHT SIZE : 300mm TRIANGLE GIMLET, REGULAR SQUARE GIMLET, REGULAR JAR GIMLET, SIZE : 9mm JAR GIMLET, SIZE : 5mm WOOD CHISELS FOR FLAT, SIZE : 30mm WOOD CHISELS FOR FLAT, SIZE : 18mm WOOD CHISELS FOR FLAT, SIZE : 9mm WOOD CHISELS FOR ROUND, SIZE : 3.3mm WOOD CHISELS FOR ROUND, SIZE : 3.7mm	2 pcs 1 pc	19/10/89 YPK - 16 12/05/89 YPK-08 24/05/89 YPK - 15 14/12/89 YPK - 23	PATTERN MAKING ROOM PATTERN MAKING ROOM PATTERN MAKING ROOM PATTERN MAKING ROOM	AZNAIZAM AZNAIZAM AZNAIZAM AZNAIZAM	SERVICEABLE SERVICEABLE SERVICEABLE SERVICEABLE	¥824,000.- ¥108,000.- ¥895,000.- ¥385,450.-	昭和63年度供与様材 (本部赠送) 昭和63年度供与様材 (本部赠送) 昭和63年度供与様材 (本部赠送) 昭和63年度供与様材 (本部赠送)

Equipment List / Foundry Group

R/D NO	NAME OF EQUIPMENT	QUANTITY	ARRIVAL	PLACE	IN CHARGE	CONDITION	PRICE	BUDGET
1014	<p>CARPENTER TOOLS</p> <p>SMALL TOOLS WITH COVERED KNIVES</p> <p>WHEAT STONE FOR ROUND CHISEL, MEDIUM</p> <p>WHEAT STONE FOR ROUND CHISEL, FINISH</p> <p>BUSH HAMMER, WEIGHT : 300g</p> <p>BUSH HAMMER, WEIGHT : 115g</p> <p>WOOD CHISELS FOR FLAT - 10pcs/set</p> <p>WOOD CHISELS FOR ROUND - 10pcs/set</p> <p>WOOD CHISELS FOR FLAT WITH HANDLE</p> <p>WOOD CHISELS FOR CONVEX WITH HANDLE</p> <p>STEEL BACK PLATE</p> <p>EMERY POWDER</p> <p>WHEAT STON FOR FINISH</p> <p>WHEAT STON FOR MEDIUM</p> <p>WHEAT STON FOR ROUGH</p> <p>KNIVES</p> <p>DRILL CHUCK, SIZE : 13mm</p> <p>STRAIGHT SHANK DRILL, SIZE : 1-13mm</p> <p>TIPS AUGER, SIZE : 6, 9, 12MM EACH-2PCS</p> <p>TIPS SAW, SIZE : 405mm</p> <p>SMALL JACK, TYPE : J-45</p> <p>MULTI VISE, JAW WIDTH : 150mm</p>	<p>1 set</p> <p>1 pc</p> <p>1 pc</p> <p>1 pc</p> <p>1 pc</p> <p>1 set</p> <p>1 set</p> <p>1 set</p> <p>1 pc</p> <p>1 pc</p> <p>1 pc</p> <p>1 pc</p> <p>1 pc</p> <p>1 pc</p> <p>1 pc</p> <p>1 pc</p> <p>1 pc</p> <p>1 pc</p> <p>1 pc</p> <p>2 sets</p> <p>6 pcs</p> <p>1 pc</p> <p>1 pc</p> <p>4 pc</p>	14/12/89 YR - 23	PATTERN MAKING ROOM	AZMAIZAM	SERVICEABLE	¥385,450.-	昭和63年度供与機材 (本邦贈送)
1015	<p>BUG FILTER DUST COLLECTOR</p> <p>MODEL : NDC - 750P 80m³/min. 415V/5.5kW</p> <p>MAKER : NIPPON DUST COLLECTOR</p>	1 set	12/08/89 YR - 08	PATTERN MAKING ROOM	AZMAIZAM	SERVICEABLE	¥2,560,000.-	昭和63年度供与機材 (本邦贈送)
1016	<p>RYOMA PORTABLE BAND SAW</p> <p>MODEL : BSW-200 WITH TRANSFORMER</p> <p>WITH BLADE (5X40X3, 120mm) 10PCS</p>	1 set	21/03/90 232- 98041613	PATTERN MAKING ROOM	AZMAIZAM	SERVICEABLE	¥357,200.-	原研門家携行機材 (本邦贈送)
1017	<p>A SET SQUARE</p> <p>COMPASS 75, 125, 250, set</p> <p>DISPTCH</p> <p>SURFACE GAUGE 250, 400, set.</p> <p>CHISEL & CLAMP 300mm, 6 pcs/set.</p> <p>MARKING GAUGE</p> <p>10 pcs/set</p> <p>BITS</p> <p>10 sets</p> <p>HAND SAW</p> <p>FLAT CURVE EDGE EITH HANDLE 10 set</p> <p>PRECISION SQUARES LEVELES 200 X 130mm</p> <p>BEVEL RULER 15cm</p> <p>GRADIATOR</p>	<p>2 pcs</p> <p>1 set</p> <p>1 set</p> <p>1 set</p> <p>1 set</p> <p>1 set</p> <p>1 set</p> <p>1 set</p> <p>1 set</p> <p>1 set</p> <p>1 set</p> <p>1 set</p> <p>1 set</p> <p>1 set</p> <p>2 pcs</p>	05/01/90 232- 98041484	PATTERN MAKING ROOM	AZMAIZAM	SERVICEABLE	<p>¥1,380.-</p> <p>¥6,100.-</p> <p>¥9,200.-</p> <p>¥13,700.-</p> <p>¥7,690.-</p> <p>¥1,920.-</p> <p>¥51,750.-</p> <p>¥57,000.-</p> <p>¥41,800.-</p> <p>¥5,180.-</p> <p>¥1,490.-</p> <p>¥1,150.-</p>	<p>深井研門家携行機材 (本邦贈送)</p>
1018	<p>VERNIER CALIPER 0 - 150mm</p> <p>VERNIER CALIPER 0 - 300mm</p> <p>DIGIMATIC HEIGHT GAGE 0 - 600mm</p> <p>VERNIER DEPTH GAGE CODE 527-201 0 - 150mm</p> <p>VERNIER DEPTH GAGE CODE 527-103 0 - 300mm</p> <p>4 GAUGE, BLOCK SET</p>	<p>2 pcs</p> <p>2 pcs</p> <p>1 pc</p> <p>2 pcs</p> <p>2 pcs</p> <p>112 pcs</p>	08/02/91 21/03/91 27/03/91	PATTERN MAKING ROOM	AZMAIZAM	SERVICEABLE	<p>¥\$ 200.-</p> <p>¥\$ 578.-</p> <p>¥\$4,790.-</p> <p>¥\$ 336.-</p> <p>¥\$ 579.-</p> <p>¥\$5,359.-</p>	平成2年度供与機材 (現地調達)

MVC

Equipment List / Foundry Group

R/D NO	NAME OF EQUIPMENT	QUANTITY	ARRIVAL	PLACE	IN CHARGE	CONDITION	PRICE	BUDGET
1019	VERNIER HEIGHT GAGE 506-201 VERNIER HEIGHT GAGE 514-160 VERNIER CALIPE 160-128	1 pc 1 pc 1 pc	23/08/91 23/08/91 23/08/91	PATTERN MAKING ROOM	AZMAIZAM	SERVICEABLE	MS 463.00 MS 645.00 MS 731.00	平成3年度供与機材 (現地調達)
1020	WHETSTONE NO 1000 (RED COLOR) 207 X 66 X 34 WHETSTONE NO 1000 (RED COLOR) 207 X width wide X 34 WHETSTONE S-1 OIL WHETSTONE KNIFE CHISEL 10pcs/set MAKING GAUGE STRETCH GAUGE (500mm) STRETCH GAUGE (700mm) GRAVER 4pcs/set MICRO PROTRACTOR MP-101 ANGLE PLATE AGD-1 TOSUWAN 400-500 HICH. SCALE STAND AUTOMATIC DRIVER 1500-240 WOODEN SCREW DRIVER 1.6 - 2.4mm RADIUS GAUGE 178MAA (0.1-1mm) RADIUS GAUGE 178MA (1.0-7mm) RADIUS GAUGE 178MR (7.5-15mm) COMPASS FOR WOODEN SC75 COMPASS FOR WOODEN SC100 COMPASS FOR WOODEN SC125 COMPASS FOR WOODEN SC150 COMPASS FOR WOODEN SC250 ANGLE GAGE NO 466 (1 - 45°) 18pcs/set	4 pcs 1 pc 5 pcs 3 pcs 1 pc 1 pc 1 set 2 pcs 1 pc 2 sets 1 set 1 set 2 pcs 2 pcs 1 pc 1 pc 1 pc 1 pc 2 pcs 2 pcs 2 pcs 2 pcs 1 set	10/12/91 YPK-4712027 "	PATTERN MAKING ROOM "	AZMAIZAM "	SERVICEABLE "	¥ 7,520.00 ¥ 3,640.00 ¥ 19,875.00 ¥ 11,050.00 ¥ 6,620.00 ¥ 42,390.00 ¥ 8,270.00 ¥ 13,275.00 ¥ 24,275.00 ¥ 12,330.00 ¥ 69,320.00 ¥ 93,880.00 ¥ 27,790.00 ¥ 53,100.00 ¥ 2,380.00 ¥ 2,665.00 ¥ 13,275.00 ¥ 3,200.00 ¥ 3,850.00 ¥ 1,760.00 ¥ 1,760.00 ¥ 1,760.00 ¥ 3,300.00 ¥ 9,950.00	大平研門家供与機材 (本邦調達)
1021	CASTING SIDE CALLIPERS 8/1000 X 300mm CASTING SIDE CALLIPERS 10/1000 X 300mm CASTING SIDE CALLIPERS 15/1000 X 300mm CASTING SIDE CALLIPERS 25/1000 X 300mm	2 pcs 2 pcs 2 pcs 2 pcs	05/03/91 232-8196-5586	PATTERN MAKING ROOM "	AZMAIZAM "	SERVICEABLE "	¥ 58,000.00 ¥ 58,000.00 ¥ 58,000.00 ¥ 58,000.00	平成2年度供与機材 (本邦調達)
1022	CASTING RULE 1 - 8/1000 X 300mm CASTING RULE 1 - 10/1000 X 300mm CASTING RULE 1 - 15/1000 X 300mm CASTING RULE 1 - 20/1000 X 300mm	2 pcs 2 pcs 2 pcs 2 pcs	05/03/91 232-8196-5586	PATTERN MAKING ROOM "	AZMAIZAM "	SERVICEABLE "	¥ 4,000.00 ¥ 4,000.00 ¥ 4,000.00 ¥ 4,000.00	平成2年度供与機材 (本邦調達)
1023	DEPTH GAUGE (VERNIER CALIPER) 1) SMD j5 150mm x 0.02 2) SMD 30 300mm x 0.02 BADER MACHINE MODEL.: DMA AC 415V, 3 Phase BEND PLANE SIZE : R=50-300mm, 9 pcs/set	1 pc 1 pc 1 set	02/01/91 YPK-04 "	PATTERN MAKING ROOM "	AZMAIZAM "	SERVICEABLE "	¥ 12,300.00 ¥ 19,200.00 ¥ 905,000.00 ¥ 33,700.00	平成2年度供与機材 (本邦調達)

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MVC

Equipment List / Foundry Group

R/D NO	NAME OF EQUIPMENT	QUANTITY	ARRIVAL	PLACE	IN CHARGE	CONDITION	PRICE	BUDGET
1023	<p>CROSS REND PLANE SIZE : R-5-50mm, 50-300mm 8 pcs/set WOOD WISE WS-10</p> <p>SCREW CENTRE JACK 1) No.7 55x75mm 2) No.9 77x110mm 3) No.10 100x150mm</p> <p>L-CLAMP SIZE : Each 6 pcs of 300x140, 250x120, 200x100, 160x80, 120x60mm.</p> <p>WOOD SMALL CUTTING MACHINE T-21 TOOT BIT HOLDER STAND TOOT BIT HOLDER (large & small size each 1pc)</p> <p>GRINDING WHEEL FOR JG-100 1 star (4pcs), Mill-stone (20 pcs) STEEL STRAIGHT EDGE SIZE : 1000x50x6mm</p>	<p>2 sets 2 pcs 4 pcs 4 pcs 4 pcs 30 pcs</p>	02/01/91 YPK-04	PATTERN MAKING ROOM	AZMATZAM	SERVICEABLE	<p>¥ 69,600.00 ¥ 92,000.00 ¥ 6,200.00 ¥ 9,800.00 ¥ 11,600.00 ¥199,500.00</p>	平成2年度供与機材 (本邦製造)
1024	<p>WOOD CHISEL, FLAT TYPE 10pcs/set WOOD CHISEL, ROUND TYPE 10pcs/set</p> <p>ENGRAVERCHISEL, FLAT TYPE 10pcs/set ENGRAVERCHISEL, ROUND TYPE 10pcs/set</p> <p>SCOOP UP CHISEL 10pcs/set POOL ROUND PLANE 10pcs/set</p> <p>SIDE PLANE Each 1pc of Right (24mm) & Left (24mm)</p> <p>SMALL PLANE 1 Each; Large (42mm), Middle (30mm), Small (18mm)</p> <p>GAS PRESSURE DETERMINATOR MODEL: PGD AC240V, SINGLE PHASE</p> <p>MELTING MATERIAL, TDOR-5 Fe-Si-Mg (5.8%) MELTING MATERIAL, TD-3 Fe-Si-Mg (3.8%) MELTING MATERIAL, TD-3 Fe-Si-Re (30%) MELTING MATERIAL, TD-3 Stream, Si-72% MELTING MATERIAL, TD-3 Carbon, C-99% MELTING MATERIAL, TD-3 Wiska 10mm</p>	<p>1 set 1 set 1 set 1 set 1 set 1 set 1 set 1 set 1 set 1 set 1 set 1 set 1 set 1 set 150 kg 200 kg 50 kg 20 kg 300 kg 100 kg</p>	02/01/91 YPK-04	PATTERN MAKING ROOM	AZMATZAM	SERVICEABLE	<p>¥ 20,400.00 ¥ 46,200.00 ¥ 49,600.00 ¥ 25,700.00 ¥ 28,500.00 ¥ 30,100.00 ¥ 46,000.00 ¥ 15,600.00 ¥ 12,300.00 ¥3,996,360.00 ¥ 67,400.00 ¥ 89,800.00 ¥ 45,900.00 ¥ 10,200.00 ¥ 64,300.00 ¥ 27,800.00</p>	平成2年度供与機材 (本邦製造)

M/C

Equipment List / Foundry Group

R/D NO	NAME OF EQUIPMENT	QUANTITY	ARRIVAL	PLACE	IN CHARGE	CONDITION	PRICE	BUDGET
1025	BOX PARALLEL OV200R.OV300B per each PLANNER FINISHING 2 Blades PLANNER CUT END PLANNING 1 Blade SAW - both side usable 266mm HAMMER STEEL HEAD DRIER "YAMATO" MODEL DN-63-2R, 240V, 50Hz Single phase RACK OF DRIER "YAMATO" MODEL OT-62 SQUARE FLAT TYPE 1,000 X 500 X 5	1 set 4 pcs 2 pcs 2 pcs 2 pcs 1 set 1 set 1 pc	05/02/92 YIPK-07 "	PATTERN MAKING ROOM "	AZAMIZAM "	SERVICABLE "	¥660,000.00 ¥102,400.00 ¥ 46,200.00 ¥ 40,600.00 ¥ 6,000.00 ¥338,000.00 ¥ 59,000.00 ¥ 36,000.00	平成3年度供与機材(本邦贈送) "

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INC

Equipment List / Foundry Group

R/P NO	NAME OF EQUIPMENT	QUANTITY	ARRIVAL	PLACE	IN CHARGE	CONDITION	PRICE	BUDGET
1.1	INFORMATION INSTRUMENT							
1101	COPY MACHINE (MINOLTA) MODEL 8707 3/NO 412177	1 set	29/03/89	HUSETTIA UTF	NORSAH	SERVICEABLE	MS27,300.-	昭和63年度供与機材 (現地調達)
1102	PERSONAL COMPUTER COMPAQ DESKPRO 286 MODEL 40 MS-DOS V3.3 COMPAQ LAPTOP SLT/286 MODEL 20 INTERNAL MODERN 2400 BAND PRINTER OKI ML 391	1 set 1 set 1 set 1 set 1 set	"	COMPUTER ROOM	FAUZI	SERVICEABLE	MS33,859.-	昭和63年度供与機材 (現地調達)
1103	VIDEO SET SONY CCDV200 SONY VIDEO CAMERA XV-C700 SONY COLOR MONITOR KA-21HG1 HITACHI VIDEO CASSETTE RECORDER VT-498EM	1 set 1 set 1 set 1 set	15/05/89	VIDEO ROOM	ROSJI	SERVICEABLE	MS15,432.-	昭和63年度供与機材 (現地調達)
1104	AUTOMATIC VOLTAGE REGULATOR	1 set	20/09/80	X-RAY ROOM	LEE	SERVICEABLE	MS11,300.-	昭和63年度供与機材 (現地調達)
1105	UNINTERRUPTIBLE POWER SUPPLY (UPS)	1 set	04/07/89	X-RAY ROOM	LEE	SERVICEABLE	MS3,500.-	昭和63年度供与機材 (現地調達)
1106	CANON α335 CANON CW-CF04 CANON CW-HP02	1 set 1 set 1 set	20/07/89	EXPERT ROOM	ODAIRA	SERVICEABLE	MS14,046.-	平成元年度供与機材 (現地調達)
1107	CANONWORD L3 SUPER II	1 set	18/07/89 232-880 4112	EXPERT ROOM	OTA	SERVICEABLE	Y126,600.-	原研門家供与機材 (本邦調達)
1108	CANON α-5	1 set	17/11/89 232-880 4137	EXPERT ROOM	ODAIRA	SERVICEABLE	Y152,600.-	深井門家供与機材 (本邦調達)
1109	HITACHI PERSONAL COMPUTER (B-16 EX-41) HITACHI KB 102 KEYBOARD HITACHI DC-244 14" COLOR CRT HITACHI MC-570 1MB RAM HITACHI KS-100 HAND IMAGE SCANNER HITACHI C60 PD-604B KANJI 16"DOT PRINTER HITACHI C60 AS 800 AUTO SHEET FEEDER	1 set 1 set 1 set 1 set 1 set 1 set	10/01/90	COMPUTER ROOM	FAUZI	SERVICEABLE	MS152,489.80	平成元年度供与機材 (現地調達)
1110	COPY MACHINE (MINOLTA EP 4230)	1 set	28/02/90	CO-ORDINATOR ROOM	KANAMORI	SERVICEABLE	MS12,000.-	原研門家供与機材 (現地調達)
1111	KODAK CAROUSEL SLIDE PROJECTOR (SAV 1050)	1 set	07/03/90	VIDEO ROOM	ROSJI	SERVICEABLE	MS2,800.-	原研門家供与機材 (現地調達)

ENC

Equipment List / Foundry Group

R/D NO	NAME OF EQUIPMENT	QUANTITY	ARRIVAL	PLACE	IN CHARGE	CONDITION	PRICE	BUDGET
1112	CABIN OVERHEAD PROJECTOR (MODEL : 21 F)	1 set	07/03/90	COMPUTER ROOM	FAUZI	SERVICEABLE	MS1,900.-	原研門家携行器材 (現地調達)
1113	HP LASER JET SERIES II PRINTER	1 set	10/03/90	COMPUTER ROOM	FAUZI	SERVICEABLE	MS11,380.-	原研門家携行器材 (現地調達)
1114	COMPUTER PROJECTION PANEL	1 set	13/03/90	COMPUTER ROOM	FAUZI	SERVICEABLE	MS3,280.-	原研門家携行器材 (現地調達)
1115	COMPAQ DESKPRO 386/20e COMPUTER SYSTEM	1 set	27/02/90	COMPUTER ROOM	FAUZI	SERVICEABLE	MS45,382.-	原研門家携行器材 (現地調達)
1116	COMPAQ STL/286 MODEL 40 LAPTOP COMPUTER C/W WORD PROCESSOR CANONRD. 4100 CANON WITH PRINTER, TRANSFORMER, PULG	1 set	21/03/90 22 98041613	CHIEF ADVISOR ROOM	OTA	SERVICEABLE	¥903,000.-	"
1117	COMPAQ 386/20E 1J13131-001 MEMORY MODULE 16M 32 BIT (100 NS)	1 set	26/07/90	COMPUTER ROOM	FAUZI	SERVICEABLE	MS 3,832.-	平成2年度供与器材 (現地調達)
1118	NEC POWERMATE 386/20 NEC P/LAWRITER PG300 PAINTJET COLOUR GRANICS PRINTER UPS MODEL 2075 QUATRO PRO VER 2.0 MICROSOFT PROJECT VER 1.0	1 set 1 set 1 set 1 set 1 set 1 set	26/08/90 " " " " "	COMPUTER ROOM " "	FAUZI FAUZI FAUZI FAUZI FAUZI	SERVICEABLE SERVICEABLE SERVICEABLE SERVICEABLE SERVICEABLE	MS12,530.- MS 2,450.- MS 4,000.- MS 5,557.- MS 2,200.- MS 1,700.-	平成2年度供与器材 (現地調達)
1119	FILM RECORDER FOR MACINTOSH	1 set	04/09/91	MEETING ROOM	FAUZI	SERVICEABLE	MS 6,130.-	平成2年度供与器材 (現地調達)
1120	CANON WORD PROCESSOR α60	1 pct	26/03/91	EXPERT ROOM	FUJIIHITO	SERVICEABLE	¥228,400.-	藤広門家携行器材
1121	TEXT BOOK	60 Books	07/09/91	LIBRARY	LEE	SERVICEABLE	MS12,300.-	平成3年度技術普及広報費
1122	CANON WORD PROCESSOR CANONRD - 4500	1 set	06/02/92	COORDINATOR ROOM	KANAMORI	SERVICEABLE	¥690,000.-	平成3年度供与器材 (本邦調達)

MIC

Equipment List / Foundry Technology Unit

R/D NO	NAME OF EQUIPMENT	QUANTITY	ARRIVAL	PLACE	IN CHARGE	CONDITION	PRICE	BUDGET
12	<u>VEHICLE</u>							
1201	MINIBUS MERCEDES 03090/35	1 unit	15/07/88	ADMINISTRATION	YUSOF	SERVICEABLE	MS108,155.80	昭和63年度供与機材 (現地調達)
1202	LAND CRUISER MITSUBISHI (PAJERO)	1 unit	31/01/80	ADMINISTRATION	JALIL	SERVICEABLE	MS82,746.11	平成元年度供与機材 (現地調達)

MNC

BOOK List / Foundry Group

R/D NO	NAME OF EQUIPMENT	QUANTITY	ARRIVAL	PLACE	IN CHARGE	CONDITION	PRICE	BUDGET
13	<u>BOOK</u>							
1301	TYUTETSU YOKAI HAND BOOK (NIHON IMONO KYOKAI)	1	31/03/89	CHIEF ADVISOR ROOM	KANAMORI	SERVICEABLE	¥8,800.-	正本専門家発行機材 (本邦購送)
1302	TYUTETSU YOKAI HAND BOOK (NIHON IMONO KYOKAI)	1	19/07/89	CHIEF ADVISOR ROOM	KANAMORI	SERVICEABLE	¥8,800.-	原研専門家発行機材 (本邦購送)
2	IMONO BINRAN (KAITEI 4 HAN) (NIHON IMONO KOGYOKAI)	1	19/07/89				¥32,000.-	
3	TYUTETSU NO ZAIHIITSU (NIHON IMONO KOGYOKAI)	1	19/07/89				¥5,700.-	
4	KINZOKU ZAIRYO DATA BOOK (NIHON KIKAKU KYOKAI)	1	19/07/89				¥2,900.-	
5	JIS HAND BOOK #1 TETSUKOU (NIHON KIRAKU KYOKAI)	1	19/07/89				¥5,260.-	
6	JIS HAND BOOK #2 HIETSU (NIHON KIKAKU KYOKAI)	1	19/07/89				¥4,430.-	
7	JIS HAND BOOK #10 KUGAI (NIHON KIRAKU KYOKAI)	1	19/07/89				¥5,930.-	
8	JIS HAND BOOK #21 ANZEN (NIHON KIKAKU KYOKAI)	1	19/07/89				¥4,600.-	
9	JIS HAND BOOK #22 YUATU KUUATU. (NIHON KIRAKU KYOKAI)	1	19/07/89				¥4,950.-	
10	JIS HAND BOOK #1 KINZOKUBUNSEKI (NIHON KIRAKU KYOKAI)	1	19/07/89				¥4,950.-	
11	TYUTETSU IMONO TYUJIZOHOUJAN NO KANGAEKATA (NIHON IMONO KOGYOKAI)	1	19/07/89				¥4,400.-	
12	IMONO ZOUKEI GIZYUTU NO YOUTEN (NIHON IMONO KOGYOKAI)	1	19/07/89				¥1,500.-	
1303	IGATA ZOKEIHO (TYUZOFUKYUOKAI)	1	19/07/89	CHIEF ADVISOR ROOM	KANAMORI	SERVICEABLE	¥12,000.-	深井専門家発行機材 (本邦購送)
2	TETUKOBINRAN KISO (MARUZEN)	1	05/01/90				¥23,000.-	
3	TETUKOBINRAN ZONEI (MARUZEN)	1	05/01/90				¥19,000.-	
4	KINZOKU DATA BOOK (NIHON KIKAKU KYOKAI)	1	05/01/90				¥7,500.-	

MIC

BOOK List / Foundry Group

R/W NO	NAME OF EQUIPMENT	QUANTITY	ARRIVAL	PLACE	IN CHARGE	CONDITION	PRICE	BUDGET
1304 1	H. I. ANGUS Cast iron physical and engineering properties.	1	01/03/90 09/03/90	LIBRARY	LEE	SERVICEABLE	M\$562.80	平成元年年度供与機材 (現地調達)
2	R. C. HURST Design of high temperature metallic components.	1					M\$142.89	
3	P. MARSHALL Austenitic stainless steels. Microstructure and mechanical properties.	1					M\$233.32	
4	P. R. BEELEY Foundry technology	1					M\$289.28	
5	P. D. WEBSTER Fundamentals of foundry technology.	1					M\$305.52	
6	I. MINOFF The physical metallurgy of cast iron.	1					M\$247.47	
7	M. A. J. RIGAUD Proceedings of the Intl Symposium on advances in refractories for the metallurgical industries.	1					M\$202.64	
8	MICHAEL B. BEVER Encyclopedia of materials science and engineering Vols. 1 to 8 set.	1					M\$7,236.00	
9	FREDERICK HAYES ROTH Building expert systems.	1					M\$142.31	
10	W. BURKART Grinding and polishing Theory and practice.	1					M\$308.74	
11	V. GUTTMANN Corrosion and mechanical stress at high temperatures.	1					M\$255.47	
12	PAUL A. SAND Advanced PASCAL Programming techniques	1					M\$70.59	
13	MICHAEL F. ASHBY Engineering materials 1 - An introduction to their properties and applications.	1					M\$167.23	
14	D. F. ALLSOP Pressure diecasting Part 2.	1					M\$115.78	

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BOOK List / Foundry Group

R/D NO	NAME OF EQUIPMENT	QUANTITY	ARRIVAL	PLACE	IN CHARGE	CONDITION	PRICE	BUDGET
15	O. VAN DER BIEST Analysis of high temperature materials.	1	01/03/90 09/03/90	LIBRARY	LEE	SERVICEABLE	M\$160.21	平成元年年度供与機材 (現地調達)
16	MARNOUD H. FARAG Materials and process selection in engineering.	1					M\$203.51	
17	B. T. KELLY Physics of graphite.	1					M\$324.75	
18	ERWIN PLOCKINGER Electric furnace steel production.	1					M\$610.88	
19	JAMES E. SOPCAK Handbook of lost wax or investment casting.	1					M\$112.56	
20	VITO J. COLANGELO Analysis of metallurgical failures.	1					M\$160.64	
21	CHRISTIAN The theory of transformations in metals and alloys PART I.	1					M\$286.22	
22	J. B. HARRIOTT High temperature alloys - their exploitability potential.	1					M\$259.80	
23	HOWARD E. BOYER Atlas of stress strain curves.	1					M\$411.65	
24	BETZALEL AVITZUR Handbook of metal forming processes	1					M\$369.84	
25	GEORGE E. DIETER Mechanical metallurgy.	1					M\$35.44	
26	I. MINKOFF Solidification and cast structure.	1					M\$208.88	
27	P. N. RAO Manufacturing technology.	1					M\$28.73	
28	GUIDE TO MATERIALS ENGINEERING DATA AND INFORMATION.	1					M\$225.12	
29	DAVID F. ROGERS Techniques for computer graphics.	1					M\$195.96	
30	G. KATEMAN Quality control in analytical chemistry.	1					M\$218.69	

ENC

BOOK List / Foundry Group

R/D NO	NAME OF EQUIPMENT	QUANTITY	ARRIVAL	PLACE	IN CHARGE	CONDITION	PRICE	BUDGET
31	YOSHISADA OGINO Catalysis and surface properties of liquid metal and alloys.	1	01/03/90 09/03/90	LIBRARY	LEE	SERVICEABLE	MS288.10	平成元年炭素与機材 (現地調達)
32	ARTHUR C. STREET The diecasting book.	1					MS305.52	
33	SIMS/STOLOFF/HAGEL Superalloys II. High temperature materials for aerospace and industrial power.	1					MS223.51	
34	E. HERRMANN Handbook on continuous casting.	1					MS1,688.40	
35	JOHN GAY Cast iron.	1					MS44.86	
36	THE POSECO FOUNDRYMAN'S HANDBOOK. 5TH ED.	1					MS176.88	
37	L. COUDURIER Fundamentals of metallurgical process.	1					MS254.06	
38	R. D. WALKER Small scale steelmaking.	1					MS125.57	
39	H. F. ASHBY Perspectives in hydrogen in metals.	1					MS353.76	
40	HERT TREATMENT '87 LONDON MAY 1987.	1					MS225.12	
41	HERT TREATMENT '84	1					MS218.69	
42	HERT TREATMENT SANGHAI '83	1					MS308.74	
43	SOLIDIFICATION TECHNOLOGY IN THE FOUNDRY AND CASTHOUSE.	1					MS353.76	
44	R. I. L. GUTHRIE Engineering in process metallurgy.	1					MS315.17	
45	R. C. KRUTENAT Metallurgical coatings 1987- VOLT 1 to 4	4					MS1,372.61	
46	V. SEDLACEK Non ferrous metals and alloys.	1					MS384.30	
47	P. T. HOULCROFT Materials data sources.	1					MS51.96	
48	J. H. CHESTERS Refractories - Production and properties.	1					MS100.80	

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BOOK List / Foundry Group

R/D NO	NAME OF EQUIPMENT	QUANTITY	ARRIVAL	PLACE	IN CHARGE	CONDITION	PRICE	BUDGET
49	P. L. JAIN Principles of foundry technology	1	01/03/90 09/03/90	LIBRARY	LEE	SERVICEABLE	M\$18.30	平成元年度供与機材 (現地調達)
50	D. N. NANDI Handbook of refractories.	1					M\$62.93	
51	P. L. JAIN Foundry patterns - Design and manufacture.	1					M\$42.89	
52	R. W. COCHRANE Rapidly quenched metals 6-VOLS. 1-3 VOLS.	3					M\$1,082.50	
53	INTERPRETING ENGINEERING DRAWINGS. INSTRUCTOR'S GUIDE.	1					M\$25.57	
54	LARRY JEFFUS Welding principles and applications. Instructor's Guide.	1					M\$24.12	
55	LARRY JEFFUS Welding principles and applications.	1					M\$180.82	
56	R. G. KING Surface treatment and finishing of aluminium	1					M\$128.64	
57	K. H. PRADIUDEV Handbook of heat treatment of steels.	1					M\$142.33	
58	MICHAEL EDELHART The Brady book of turbo pascal.	1					M\$64.16	
59	T. J. SMITH Modelling the flow and solidification of metals.	1					M\$207.90	
60	PHILIP KLAHR Expert systems. Techniques, tools, and applications.	1					M\$131.69	
61	LARRY KERSCHBERG Expert database systems.	1					M\$155.98	
62	EDWARD G. HOFFMAN Jig and fixture design.	1					M\$50.94	
63	DAVID L. GOETSCH Structural drafting.	1					M\$86.67	
64	RUDOLF O. MÜLLER Spectrochemical analysis by X-ray Fluorescence.	1					M\$176.88	

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R/D NO	NAME OF EQUIPMENT	QUANTITY	ARRIVAL	PLACE	IN CHARGE	CONDITION	PRICE	BUDGET
65	J. S. PLEX Introduction to fluorescence microscopy	1	01/03/90 09/03/90	LIBRARY	LEE	SERVICABLE	MS25.72	平成元年年度供与機材 (現地調達)
66	LARRY JOEL GOLDSTEIN Advanced BASIC for the IBM PC and compatibles : Types and techniques.	1					MS160.64	
67	RON JENKINS X-ray fluorescence spectrometry	1					MS209.04	
68	R. A. EARNSHAW Geometric modelling and computer graphics. Techniques and applications.	1					MS321.60	
69	S. S. RAO The finite element method in engineering.	1					MS221.90	
70	D. N. CRYTHER Heat transfer fuels & refractories fluid flow in furnace technology.	1					MS72.04	
71	M. YUSSOUFF Current trends in the physics of materials.	1					MS215.47	
72	PETER JACKSON Introduction to expert systems.	1					MS79.60	
73	PAUL F. HOGAN Modelling and simulation on microcomputers 1987.	1					MS90.05	
74	ROBERT HAWKINS Tools for the simulation profession.	1					MS51.46	
75	KNUD ERIK WICHMANN / JOHANNES RETTI Simulation in computer integrated techniques	1					MS96.48	
76	RICHARD K. MILLER Artificial intelligence applications in manufacturing.	1					MS424.51	
77	M. A. J. RIGAUD Proceedings of the International Symposium on advances in refractives for the metallurg ical industries vol. 4.	1					MS192.96	
78	DONALD V. BROWN Basic metallurgy.	1					MS48.24	
79	M. ZANDI Computer aided design & drafting.	1					MS80.24	

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R/P NO	NAME OF EQUIPMENT	QUANTITY	ARRIVAL	PLACE	IN CHARGE	CONDITION	PRICE	BUDGET
80	GARY R. BERTOLINE Fundamentals of CAD.	1	01/03/90 06/03/90	LIBRARY	LEE	SERVICEABLE	MS\$77.02	平成元年年度供与機材 (現地調達)
81	ROBERT E. SMALLWOOD Refractory metals and their industrial applications.	1					MS\$61.10	
82	BEHAL / MELILLI Stainless steel castings.	1					MS\$144.72	
83	NISBETT / MELILLI Steel forgings.	1					MS\$189.74	
84	BALBIR S. DHILLON Quality control, reliability and engineering design.	1	13/03/90 30/03/90	LIBRARY	LEE	SERVICEABLE	MS\$223.78	平成元年年度供与機材 (現地調達)
85	HAROLD L. GILMORE Integrated product testing and evaluation.	1					MS\$59.46	
86	ROBERT M. EASTMAN Materials handling.	1					MS\$288.10	
87	ROBERT M. RETHEA Statistical methods for engineers and scientists.	1					MS\$179.66	
88	RALPH J. HARRISON Artificial intelligence applications in materials science.	1					MS\$180.10	
89	DON M. INGELS What every engineer should know about computer modeling and simulation.	1					MS\$112.56	
90	DONALD L. HUSTON Finite element methods - An introduction.	1					MS\$191.35	
91	WILLIAM D. ENGELKE How to integrate CAD/CAM systems.	1					MS\$241.20	
92	J. K. HENGLITZ X-ray spectrometry.	1					MS\$369.84	
93	ULRICH REMBOLD Interface technology for computer controlled manufacturing processes.	1					MS\$223.78	
94	WHAT EVERY ENGINEER SHOULD KNOW ABOUT ARTIFICIAL INTELLIGENCE.	1					MS\$80.70	

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R/D NO	NAME OF EQUIPMENT	QUANTITY	ARRIVAL	PLACE	IN CHARGE	CONDITION	PRICE	BUDGET
95	THE PRACTICAL FOUNDRYMAN'S GUIDE TO FEEDING & RUNNING GRAY C. G. & S. G. CASTINGS.	1	13/03/90 30/03/90	LIBRARY	LEE	SERVICEABLE	MS\$22.42	平成元年度供与機材 (現地調達)
96	FUNDAMENTALS CORE TECHNOLOGY.	1					MS\$6.84	
97	METAL CASTING DICTIONARY.	1					MS\$4.56	
98	COST ACCOUNTING.	1					MS\$93.68	
99	GUIDE TO SAND ADDITIVES.	1					MS\$129.12	
100	FOUNDRY ENERGY MANAGEMENT.	1					MS\$290.52	
101	SHELL PROCESS FOUNDRY PRACTICE.	1					MS\$161.40	
102	FURAN RESIN AIRSET SAND.	1					MS\$2.28	
103	CUPOLA HANDBOOK.	1					MS\$287.36	
104	DUCTILE IRON MOLTEN PROCESS.	1					MS\$129.12	
105	CASTING COPPER BASE ALLOYS.	1					MS\$235.96	
106	BASIC PRINCIPLES OF RISERING.	1					MS\$36.84	
107	BASIC PRINCIPLES OF GATING.	1					MS\$6.84	
108	MOLD & CORE COATINGS MANUAL.	1					MS\$129.12	
109	INTERNATIONAL ATLAS OF CASTING.	1					MS\$129.12	
110	GRAPHITE FLOTATION IN DUCTILE IRO.	1					MS\$4.56	
111	GREEN SAND ADDITIVES.	1					MS\$129.12	
112	WAX BINDER & SLURRY TEST HANDBOOK.	1					MS\$58.24	
113	INVESTMENT CASTING WAXES.	1					MS\$161.40	
114	SHELL CRACKING.	1					MS\$129.12	
115	GRAY IRON MICROSTRUCTURE RATING CHART.	1					MS\$2.28	
116	FOUNDRYMAN'S GUIDE TO DUCTILE IRON MICROSTRUCTURES.	1					MS\$161.40	
117	FUNDAMENTAL MOLDING SAND TECHNOLOGY.	1					MS\$6.84	
118	FOUNDRY HEALTH & SAFETY GUIDE.	1					MS\$93.68	
119	PATTERN MAKING.	1					MS\$6.84	

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R/D NO	NAME OF EQUIPMENT	QUANTITY	ARRIVAL	PLACE	IN CHARGE	CONDITION	PRICE	BUDGET
120	PATTERN MAKER'S MANUAL.	1	13/03/90	LIBRARY	LEE	SERVICEABLE	¥322.80	平成元年提供与様材 (現地調達)
121	DUCTILE IRON MICROSTRUCTURE RATING CHART.	1	30/03/90				¥32.28	
122	COST ACCOUNTING METHOD FOR IRON FOUNDRIES.	1					¥48.42	
123	PLASTER MOLD HANDBOOK.	1					¥28.89	
124	HISTORY CAST IN METAL.	1					¥96.84	
125	CUPOLA OPERATIONS GUIDE.	1					¥38.74	
126	STEEL CASTING HANDBOOK.	1					¥112.98	
127	PROCEEDINGS OF THE AFS/CFI CONF. ON THERMAL ANALYSIS OF MOLTEN ALUMINUM.	1					¥161.40	
128	THE KEY MINIMUM MAXIMUM STANDARDS PROCESS CONTROL SYSTEM.	1					¥161.40	
129	THE REGULATION OF AIR FOR ENERGY CONSERVATION IN ENGINEERING GUIDELINES.	1					¥96.84	
130	BASIC PRINCIPLES OF METALLURGY VOL. 1	1					¥96.84	
131	CONFERENCE ON CLEANING ROOM TECHNOLOGY.	1					¥64.56	
132	CONFERENCE ON CUPOLA OPERATIONS.	1					¥64.56	
133	CORELESS INDUCTION FURNACE TYPE.	1					¥32.28	
134	FOUNDRY VENTILATION MANUAL	1					¥93.68	
135	PROCEEDINGS OF AFS/CFI FOUNDRY MAINT. CONF.	1					¥64.56	
136	CORELESS FURNACE POWER SYSTEM.	1					¥32.28	
137	METALCASTER'S REFERENCE GUIDE.	1					¥90.52	
138	PRINCIPLES OF SHELL PROCESS.	1					¥96.84	
139	INDUSTRIAL ENGINEERING IN THE FOUNDRY.	1					¥25.96	
140	CUPOLA MELTING SYSTEM SELECTIONS.	1					¥32.28	
141	CLEANING CASTINGS.	1					¥29.12	
142	ENERGY & THE FOUNDRY.	1					¥32.28	
143	NICKEL AS AN ALLOY IN CAST IRON.	1					¥32.28	
144	BASIC PRINCIPLES OF METALLURGY VOL. 2	1					¥96.84	

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R/D NO	NAME OF EQUIPMENT	QUANTITY	ARRIVAL	PLACE	IN CHARGE	CONDITION	PRICE	BUDGET
145	CUPOLA MELTING VOL. I	1	13/03/80	LIBRARY	LEE	SERVICEABLE	M\$96.84	平模元年度供与器材 (现值调适)
146	CUPOLA MELTING VOL. II	1	30/03/80				M\$96.84	
147	FINISHING CASTINGS IN THE CLEANING ROOM	1					M\$96.84	
148	GUIDELINES FOR DEVELOPING NATURAL GAS REDUCTION PHASEOUT PLANS FOR FOUNDRIES.	1					M\$32.28	
149	HOT TEAR CONTROL HANDBOOK FOR ALUMINIUM FOUNDRIES AND CASTING DESIGNERS.	1					M\$32.28	
150	INDUSTRIAL NOISE CONTROL.	1					M\$103.68	
151	INTRODUCTION TO CAST METALS INDUSTRY.	1					M\$96.84	
152	CORE & MOLD PROCESS CONTROL.	1					M\$123.12	
153	RI-SER.	1					M\$2,098.20	
154	LEAST COST CHARGE.	1					M\$2,098.20	
155	GATING OF STEEL.	1					M\$2,098.20	
156	GATING OF IRON	1					M\$2,098.20	
157	CUPOLA OPERATIONS EVAL.	1					M\$2,582.40	
158	PROGRAMMED LEARNING SERIES OF *13 TEXTBOOKS.	1					M\$807.00	
159	METHODS FOR MODERN SCULPTORS.	1					M\$51.46	
160	PATTERNMAKERS GUIDE.	1					M\$321.60	
161	DUCTILE IRON PRODUCTION PRACTICES.	1					M\$160.80	
162	ANALYSIS OF CASTING DEFECTS.	1					M\$182.96	
163	PRINCIPLES OF INDUCTION MELTING.	1					M\$26.11	
164	CASTING DEFECTS HANDBOOK.	1					M\$128.64	
165	CAST METALS TECHNOLOGY.	1					M\$86.83	
166	METAL CASTING & MOLDING PROCESSES.	1					M\$160.80	
167	MOLD & CORE TEST HANDBOOK	1					M\$321.60	
168	METALS HANDBOOK VOL. 15 - CASTING.	1					M\$482.40	
169	INFORMATION SOURCES ON THE FOUNDRY INDUSTRY.	1					M\$12.66	

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R/D NO	NAME OF EQUIPMENT	QUANTITY	ARRIVAL	PLACE	IN CHARGE	CONDITION	PRICE	BUDGET
170	BOOK VOL.1 : Properties & selections : Irons and Steels. VOL.2 : Properties & selections : Nonferrous alloys and pure metals. VOL.3 : Properties & selections : Stainless steels, tool materials and special purpose metals. VOL.4 : Heat treating VOL.5 : Surface cleaning, finishing and coating. VOL.6 : Welding, brazing and soldering. VOL.7 : Powder metallurgy. VOL.8 : Mechanical testing. VOL.9 : Metallography & microstructures. VOL.10 : Materials characterization. VOL.11 : Failure analysis and prevention. VOL.12 : Fractography & atlas of fractographs VOL.13 : Corrosion. VOL.14 : Forming and forging. VOL.15 : Casting. VOL.16 : Machining. VOL.17 : Nondestructive evaluation & quality control.	1 1	22/01/91	LIBRARY	LEE	SERVICEABLE	M\$ 359.64	平成2年度供与様材 (現地調達)

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R/D NO	NAME OF EQUIPMENT	QUANTITY	ARRIVAL	PLACE	IN CHARGE	CONDITION	PRICE	BUDGET
H41006GK001	<u>BOOK</u> International Foundry Dictionary	1	28/08/92	LIBRARY	LEE	SERVICEABLE	RM 429.00	平成 4年度現地研究費
H41006GK002	Iron Castings Handbook	1					130.00	
H41006GK003	Austempered Ductile Iron	1					176.80	
H41006GK004	Casting Magnesium	1					140.40	
H41006GK005	The Expendable Pattern Casting Process Vol 1	1					122.20	
H41006GK006	The Expendable Pattern Casting Process Vol 2	1					122.20	
H41006GK007	The Expendable Pattern Casting Process Vol 3	1					122.20	
H41006GK008	Gas Defect in Grey & Ductile Iron Casting	1					195.00	
H41006GK009	Gas Porosity in Aluminium Casting	1					122.20	
H41006GK010	Gating & Riserling of Aluminium	1					122.20	
H41006GK011	Gating & Riserling of Cast Iron	1					195.00	
H41006GK012	Gating & Riserling of Copper Base Alloy	1					122.20	
H41006GK013	Gating & Riserling of Steel	1					176.00	
H41006GK014	Inclusion in Cast Iron	1					104.00	
H41006GK015	Inclusion in Steel	1					140.40	
H41006GK016	Inoculation of Grey & Ductile Iron	1					176.80	
H41006GK017	Sand Reclamation	1					140.40	
H41006GK018	Transaction 1991 Vol. 99	1					377.00	
H41006GK019	Transaction 1990 Vol. 98	1					377.00	
H41006GK020	Transaction 1989 Vol. 97	1					377.00	
H41006GK021	Transaction 1988 Vol. 96	1					358.80	
H41006GK022	Transaction 1987 Vol. 95	1					340.60	
H41006GK023	Transaction 1986 Vol. 94	1					322.40	
H41006GK024	Transaction 1984 Vol. 92	1					231.40	
H41006GK025	Application of Thermal Parameter Based Porosity Criteria to Long - Freezing Range Aluminium Alloys	1					87.60	

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R/D NO	NAME OF EQUIPMENT	QUANTITY	ARRIVAL	PLACE	IN CHARGE	CONDITION	PRICE	BUDGET
	BOOK							
H41006GR026	Report on Furnace Toughness A 357	1	28/08/02	LIBRARY	LEE	SERVICEABLE	RM 85.80	平成 4年度現地研究費
H41006GR027	A Literature Review of Theories for the Formation of Metal Penetration Defects	1					85.80	
H41006GR028	Lead-Free Reduced - Lead Plumbing Alloy Evaluation	1					156.80	
H41006GR029	Report on Fracture Toughness in B201	1					85.80	
H41006GR030	Alternate Utilization of Foundry Waste Sand Phase 1	1					85.80	
H41006GR031	Alternate Utilization of Foundry Waste Sand Phase 2	1					195.00	
H41006GR032	Fatigue Properties of Heavy Section AII - Summary of Work	1					49.40	
H41006GR033	Composition Section Size & Microstructural Effects on the Tensile Properties of Pearlitic Grey Iron	1					195.00	
H41006GR034	Phase 1 - Report on Process Modelling of Cupola Furnaces	1					195.00	
H41006GR035	Phase 1 - Report on EPC Technology	1					195.00	
H41006GR036	Phase 2 - Report on EPC Technology	1					195.00	
H41006GR037	Laboratory Leaching of Organic Compounds in Ferrous Foundry Process Waste	1					195.00	
H41006GR038	Identification of Emissions & Solid Waste Generated from the EPC Process:- Literature Review & Analysis	1					104.00	
H41006GR039	Evaluation of Formcoke Potential for Cupola Furnaces	1					85.80	
H41006GR040	Feasibility of Reclaiming Investment Shell Material	1					85.80	
H41006GR041	Solidification Characteristics of Aluminium Alloys - Vol. 2	1					723.30	

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R/D NO	NAME OF EQUIPMENT	QUANTITY	ARRIVAL	PLACE	IN CHARGE	CONDITION	PRICE	BUDGET
H41007GK001	<u>BOOK</u> 1992 JIS Hand book : Ferrous metal and metallurgy.	1	10/10/92	LIBRARY	LEE	SERVICEABLE	M\$ 474.52	平成4年度現地研究費
H41007GK002	1992 JIS Hand book : Non-ferrous metal and metallurgy.	1					423.52	
H41107GK001	1992 Annual book of ASTM Section 1 Iron and Steel products.	7	05/11/92	LIBRARY	LEE	SERVICEABLE	M\$ 1,023.00	平成4年度現地研究費
H41107GK003								
H41107GK004								
H41107GK005								
H41107GK006								
H41107GK007								
H41107GK008	1992 Annual book of ASTM Section 2 Non-ferrous metals products.	5	05/11/92	LIBRARY	LEE	SERVICEABLE	M\$ 778.82	平成4年度現地研究費
H41107GK009								
H41107GK010								
H41107GK011								
H41107GK012								
H41113GK001	Non-ferrous alloys 25 types.	1 set					¥ 180,000.00	
H41113GK002	Standard microstructure book-Group 0, S	1					¥ 2,500.00	
H41113GK003	Standard microstructure book-Group 2	1					¥ 2,500.00	
H41113GK004	Standard microstructure book-Group 3	1					¥ 2,500.00	
H41113GK005	Standard microstructure book-Group 4	1	20/11/92	X-RAY ROOM	LEE	SERVICEABLE	¥ 2,500.00	平成4年度現地研究費

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R/D NO	NAME OF EQUIPMENT	QUANTITY	ARRIVAL	PLACE	IN CHARGE	CONDITION	PRICE	BUDGET
	BOOK							
H41120GK001	Brain Power	1	28/11/92	LIBRARY	LEE	SERVICEABLE	RM 38.50	平成 4年度現地研究費
H41120GK002	Understanding Local Area Network	1					53.15	
H41120GK003	Kamus Dewan	1					95.00	
H41120GK004	Word Perfect S. I	1					88.15	
H41120GK005	Using Clipper	1					58.75	
H41120GK006	Handbook of Business Letters	1					53.90	
H41120GK007	Turbo Pascal	1					40.25	
H41120GK008	Quality Engineering in Production System	1					21.65	
H41120GK009	AI in Process Control	1					40.40	
H41120GK010	Materials for Engineering	1					41.85	
H41120GK011	Mechanical Drawing	1					40.50	
H41120GK012	Introduction to Materials Science for Engineers	1					40.50	
H41120GK013	Newsletters	1					44.80	
H41120GK014	Engineering Materials Vol.2	1					26.45	
H41120GK015	Engineering Materials Vol.1	1					21.60	
H41120GK016	Engineering Materials	1					45.35	
H41120GK017	Technical Drawing	1					42.40	
H41120GK018	Total Quality Control	1					43.50	
H41120GK019	Basic Engineering Drawing	1					21.30	
H41120GK020	Mini Dictionary of Physics	1					17.05	
H41120GK021	Mini Dictionary of Chemistry	1					17.05	
H41120GK022	Introduction to Quality Engineering	1					40.50	
H41120GK023	The Pocket Oxford Dictionary	1					35.10	
H41120GK024	Business and Technical	1					25.55	
H41120GK025	Technical Presentation Skills	1					25.75	

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R/D NO	NAME OF EQUIPMENT	QUANTITY	ARRIVAL	PLACE	IN CHARGE	CONDITION	PRICE	BUDGET
	BOOK							
H41120GK026	Practical Time Management	1	28/11/92	LIBRARY	LEE	SERVICEABLE	RM 44.90	平成 4年度現地研究費
H41120GK027	Malaysia Engineering Supporting Industries	1	28/11/92				48.00	
H41120GK028	Total Quality Control	1	28/11/92				34.50	
H41120GK029	Taguchi Techniques for Quality Engineering	1	28/11/92				34.50	
H41120GK030	Technology of Machine Tools	1	28/11/92				51.85	
H41120GK031	Manufacturing Technology Selection of Materials	1	28/11/92				22.40	
H41120GK032	Selection of Materials & Manufacturing Process for Engineering Design	1	28/11/92				39.15	
H41119GK001	Metal Matrix Composites 15	1	27/11/92				357.50	
H41119GK002	Plasticity of Metals & Alloys	1	27/11/92				328.95	
H41119GK003	Steel - A Handbook for Materials Research	1	27/11/92				933.80	
H41202GK001	Smithells Metals Reference Book	1	02/12/92				508.25	
H41202GK002	Engineering Materials Technology	1	02/12/92				113.75	
H41206GK001	Encyclopedia World Dictionary	1	02/12/92				59.90	
H41206GK002	Technology of the Metal Trade	1	04/12/92				100.00	
H41206GK003	Blaskett:Lead & it's Alloys	1	10/12/92				258.11	
H41206GK004	Lindberg:Processes & Materials Manufacturing	1	10/12/92				23.00	
H41210GK001	Good Word Guide	1	21/12/92				47.95	
H41210GK002	Writing Up Research	1	21/12/92				65.25	
H41210GK003	Rogets Thesaurus of English Words	1	21/12/92				65.25	
H41211GK001	Successful Quality Control Clues Part One	1	21/12/92				12.00	
H41211GK002	Successful Quality Control Clues Part Two	1	21/12/92				12.00	
H41211GK003	In Search of Excellence	1	21/12/92				22.90	

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	<u>BOOK</u>							
1305 - 1	Kinzokubinran (NIHON-KINZOKU-GATSUKAI)	1	18/03/91	EXPERTS ROOM	FUJIIHRO	SERVICEABLE	¥ 39,140.00	太田専門家旅行機材
1305 - 2	JIS Ferrous materials and metallurgy. (NIHON-KIKAKU-KYOKAI)	1					¥ 18,600.00	
1305 - 3	JIS Non-ferrous materials and metallurgy.	1					¥ 17,000.00	
1305 - 4	JIS Automobiles. Parts and components.	1					¥ 17,500.00	
1305 - 1	JIS HAND BOOK (English) - Ferrous materials and metallurgy (NIHON KIKAKU KYOKAI)	1	31/07/91	CHIEF ADVISOR ROOM	KANAMORI	SERVICEABLE	¥ 18,600.00	
1305 - 2	JIS HAND BOOK (English) - Non-ferrous metals and metallurgy (NIHON KIKAKU KYOKAI)	1					¥ 17,000.00	
1305 - 3	JIS HAND BOOK (English) - Automobiles:Parts and components.	1					¥ 5,600.00	
1305 - 4	JIS HAND BOOK - Tetsukou (NIHON KIKAKU KYOKAI)	1					¥ 4,900.00	
1305 - 5	JIS HAND BOOK - Hitetsu (NIHON KIKAKU KYOKAI)	1					¥ 39,140.00	
1305 - 6	Kinzokubinran (MARUZEN)	1					¥ 32,960.00	
1305 - 7	Imonobinran (MARUZEN)	1					¥ 46,350.00	
1305 - 8	Kikai-keugaku-binran (KISO) (MARUZEN)	Units					¥ 32,960.00	
1305 - 9	NIHON-KIKAI-GATSUKAI Kikai-keugaku-binran (OYO) (MARUZEN)	1					¥ 20,085.00	
1305 - 10	Industrial machines and equipments. Kagakubinran (KISO) (MARUZEN)	1	31/07/91	CHIEF ADVISOR ROOM	DR.OTA	SERVICEABLE	¥ 27,000.00	
1305 - 11	Kagakubinran (OYO) (MARUZEN)	1					¥ 9,790.00	
1305 - 12	Rgakujiten (IWANAMI)	1					¥ 3,900.00	平成4年度現地業務費
H40510GG001	JIS Yearbook 1991	1	19/05/92	EXPERTS ROOM	FUJIIHRO	SERVICEABLE	¥ 3,900.00	
H40510GG002	Kinzoku Zairyo Data book	1					¥ 39,140.00	藤広専門家旅行機材
1307 - 1	Kinzoku Binran (KAITEI 5 JAN) (NIHON KINZOKU GATSUKAI)	1	18/03/91	EXPERTS ROOM	FUJIIHRO	SERVICEABLE	¥ 18,600.00	
1307 - 2	JIS Ferrous Materials and Metallurgy (NIHON KIKAKU KYOKAI)	1					¥ 17,000.00	
1307 - 3	JIS Non-ferrous Materials and Metallurgy (NIHON KIKAKU KYOKAI)	1					¥ 17,500.00	
1307 - 4	JIS Automobiles:Parts and components (NIHON KIKAKU KYOKAI)	1						

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EXPENSES BY THE JAPANESE SIDE

(Unit : Thousand Yen)

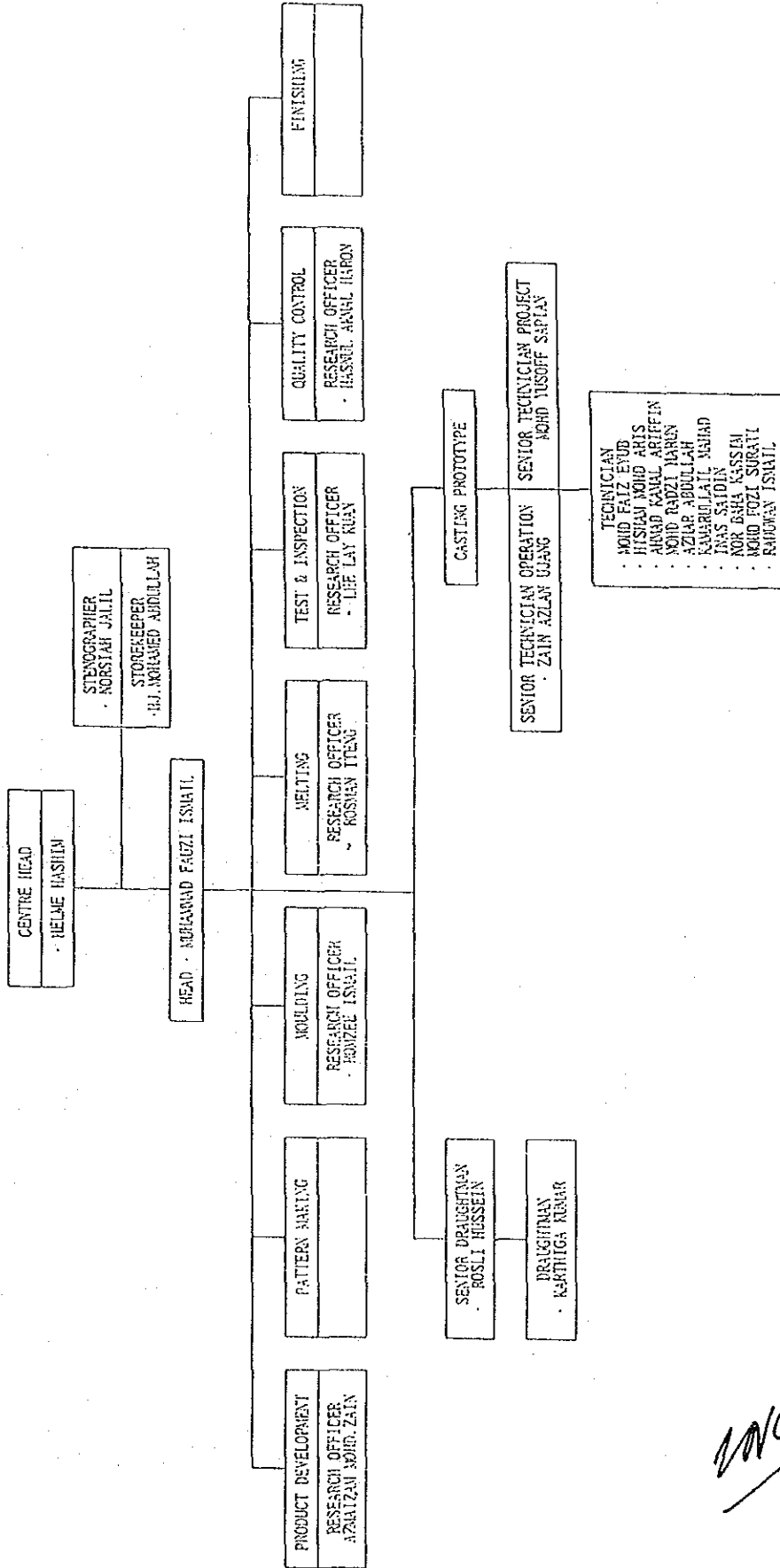
JAPANESE FISCAL YEAR ITEM	1988	1989	1990	1991	1992	1993	Total
DISPATCH OF TEAMS	3,944	6,241	4,112	2,719	2,915		19,931
DISPATCH OF EXPERTS	13,074	66,529	79,371	85,370	61,839	8,614	314,797
ACCEPTANCE OF C/Ps	600	8,807	10,509	17,621	5,977		43,514
PROVISION OF MACHINERY AND EQUIPMENT	99,344	213,176	31,465	23,285	18,725		385,995
TOTAL	116,962	294,753	125,457	128,995	89,456	8,614	764,237

EXPENSES : Oct . 1988 ~ Apr . 1993

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FOUNDRY GROUP ORGANISATION STRUCTURE 1993



LIST OF COUNTERPARTS

No	NAMES	POSITION	QUALIFICATION	EMPLOYMENT DATE	ATTACHMENT	SECTION	JICA TRAINING PROGRAM
1.	Mr. Muhammad Fauzi Ismail	FG HEAD	UNIVERSITY	01.01.1986	FG		27.05.1990 - 19.09.1990
2.	Miss Lee Lay Kuan	RESEARCH OFFICER	UNIVERSITY	01.04.1989	FG	TESTINSPECTION	27.05.1990 - 19.09.1990
3.	Mr. Azmalizam B. Hj. Mohd Zain	RESEARCH OFFICER	UNIVERSITY	02.01.1991	FG	PRO. DEVELOPMENT	05.09.1991 - 08.03.1992
4.	Mr. Ronzee B. Ismail	RESEARCH OFFICER	UNIVERSITY	01.11.1991	FG	MOLDING	19.05.1992 - 08.08.1992
5.	Mr. Hasnul Akmal	RESEARCH OFFICER	UNIVERSITY	02.12.1991	FG	QUALITY CONTROL	19.05.1992 - 08.08.1992
6.	Mr. Rosman Iteng	RESEARCH OFFICER	UNIVERSITY	02.01.1991	FG	MELTING	19.05.1992 - 08.08.1992
7.	Mr. Zain Azlan Ujang	SENIOR TECHNICIAN	POLYTECHNIC	19.05.1987	FG	MELTING	14.05.1989 - 16.08.1989
8.	Mr. Rosli B. Hussein	SENIOR DRAUGHTMAN	SPVM	01.02.1988	FG	DRAFTMAN	14.05.1989 - 16.08.1989
9.	Mr. Yusoff D. Safian	SENIOR TECHNICIAN	SPVM	01.02.1988	FG	PATTERN	14.05.1989 - 16.08.1989
10.	Mr. Ahmad Kamal Ariffin	TECHNICIAN	POLYTECHNIC	01.04.1989	FG	MOLDING	05.11.1991 - 11.02.1992
11.	Mr. Azhar Abdullah	TECHNICIAN	POLYTECHNIC	01.04.1989	FG	TESTINSPECTION	09.05.1991 - 15.08.1991
12.	Mr. Hisham S. Mohd Aris	TECHNICIAN	POLYTECHNIC	01.04.1989	FG	MELTING	09.05.1991 - 15.08.1991
13.	Mr. Kasalutaili Mshad	TECHNICIAN	POLYTECHNIC	17.04.1989	FG	QUALITY CONTROL	05.11.1991 - 11.02.1992
14.	Mr. Mohd Faiz B. Ayub	TECHNICIAN	POLYTECHNIC	28.03.1989	FG	MOLDING	14.05.1989 - 16.08.1989
15.	Mr. Mohd Badzi Harun	TECHNICIAN	POLYTECHNIC	01.04.1989	FG	PATTERN	09.05.1991 - 15.08.1991
16.	Mr. Noor Bahr B. Kassim	TECHNICIAN	POLYTECHNIC	02.01.1991	FG	FINISHING	05.11.1991 - 11.02.1992
17.	Mr. Inas B. Saidin	TECHNICIAN	POLYTECHNIC	02.01.1991	FG	TESTINSPECTION	13.05.1993 - 10.08.1993
18.	Mr. Ahmad Fozi Suratli	TECHNICIAN	POLYTECHNIC	01.10.1991	FG	MOLDING	13.05.1993 - 10.08.1993
19.	Mr. Karthiga Kumar	DRAUGHTMAN	SPVM	01.10.1991	FG	PRO. DEVELOPMENT	13.05.1993 - 10.08.1993
20.	Mr. Radhwan Ismail	TECHNICIAN	POLYTECHNIC	16.01.1993	FG	TESTINSPECTION	
21.	Mr. Mohamed Abdullah	STOREKEEPER	PRIMARY SCHOOL	01.04.1989	TEMPORARY	STORE	
22.	Mrs. Norsiah Bt. Jalil	STENOGRAPHER	ITM	01.09.1991	FG	STENOGRAPHER	
23.	Mr. Abdul Jalil B. Mohd Isa	DRIVER	PRIMARY SCHOOL	01.05.1980	TEMPORARY	DRIVER	
24.	Mr. Mohd Hamil	DRIVER	PRIMARY SCHOOL	01.01.1993	FG	DRIVER	

PROVISION OF INFRASTRUCTURE BY THE MALAYSIAN SIDE

No.	Item	Purpose
1.	<u>Building extension</u>	Location of moulding and melting facilities: <ul style="list-style-type: none"> · sand treatment plants · sand dryer · induction furnaces · recycled materials storage · pouring zone
2.	<u>Additional building</u> <ul style="list-style-type: none"> · sand storage · electricity substation · emergency power supply generator 	<ul style="list-style-type: none"> · sand storage · room for substation · room for emergency power unit
3.	<u>Additional space</u> <ul style="list-style-type: none"> · XRF room · sand test room · pattern making room · design room · meeting room · discussion room · lounge · heat treatment area 	<ul style="list-style-type: none"> · chemical composition and analysis (XRF Analyzer and C.S. Analyzer) · sand properties analysis · wood pattern making · drawing, design and simulation · meetings · discussions · receiving guest and customers · heat treatment of castings
4.	<u>New building extension</u> <ul style="list-style-type: none"> · resin pattern room · T&I room · shopfloor 	<ul style="list-style-type: none"> · chemical storage for Cu-alloy testings and resin pattern making · dimensional check, nodular count, microstructure sample preparation · location for various machineries: <ul style="list-style-type: none"> i. brinell hardness tester ii. lathe machine iii. band saw iv. CMM

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MACHINERY AND EQUIPMENT PURCHASED BY THE MALAYSIAN SIDE

YEAR	NAME OF MACHINERY AND EQUIPMENT	PRICE
1989	1. OVER HEAD HOIST CRANE	RM 143,000-
SUB TOTAL		RM 143,000-
1990	1. STANDARD SAMPLES	RM 50,000-
	2. HEAT CONDUCTIVITY TESTER	RM 43,000-
	3. UNINTERRUPTIBLE POWER SUPPLY	RM 100,000-
SUB TOTAL		RM 193,000-
1991	1. SOLSTAR SIMULATION SOFTWARE	RM 192,000-
	2. HEAT TREATMENT FURNACE	RM 125,100-
SUB TOTAL		RM 317,100-
	1. QUENCHING TANK FOR HEAT TREATMENT	RM 42,820-
	2. AUTOCAD SOFTWARE	RM 27,600-
	3. PERSONAL COMPUTERS	RM 54,000-
	4. BATTERY OPERATED STACKER	RM 7,000-
SUB TOTAL		RM 131,420-
TOTAL		RM 784,520-

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EXPENSES BY THE MALAYSIAN SIDE

(M\$)

	YEAR ITEM	1989	1990	1991	1992	1993	Total
Development Budget	1. Building	925,450.00	500,000.00		600,000.00	113,111.00	2,138,561.00
	2. Equipment	143,000.00	193,000.00	317,100.00	131,420.00		784,520.00
	3. Others	198,421.79	130,000.00				328,421.79
	Sub Total	1,266,871.79	823,000.00	317,100.00	731,420.00	113,111.00	3,251,502.79
Operating Budget	1. Material	30,320.27	87,000.00	45,000.00			162,320.27
	2. Operation	13,949.95			75,000.00	30,728.00	119,677.95
	Sub Total	44,270.22	87,000.00	45,000.00	75,000.00	30,728.00	281,998.22
Research & Development Budget	1. Moulding			20,000.00			20,000.00
	2. Scrap			14,600.00			14,600.00
	3. Wood			10,000.00			10,000.00
	4. Sand			15,000.00			15,000.00
	5. Product Development				65,000.00	145,000.00	210,000.00
	6. Moulding Development				40,000.00		40,000.00
	7. Factory Visit	1,848.52					1,848.52
	Sub Total	1,848.52	-	59,600.00	105,000.00	145,000.00	311,448.52
	Total	1,312,990.53	910,000.00	421,700.00	911,420.00	288,839.00	3,844,949.53

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MINUTES OF DISCUSSIONS
BETWEEN THE JAPANESE EVALUATION TEAM
AND THE AUTHORITIES CONCERNED OF
THE GOVERNMENT OF MALAYSIA
ON THE JAPANESE PROJECT-TYPE TECHNICAL COOPERATION
FOR THE FOUNDRY TECHNOLOGY UNIT PROGRAMME
IN MALAYSIA

JAPAN INTERNATIONAL COOPERATION AGENCY (JICA)
STANDARDS AND INDUSTRIAL RESEARCH INSTITUTE OF MALAYSIA (SIRIM)

1 JUNE 1993
SHAH ALAM, SELANGOR DARUL EHSAN
MALAYSIA

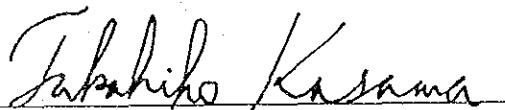
MINUTES OF DISCUSSIONS
BETWEEN THE JAPANESE EVALUATION TEAM
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THE GOVERNMENT OF MALAYSIA
ON THE JAPANESE PROJECT-TYPE TECHNICAL COOPERATION
FOR THE FOUNDRY TECHNOLOGY UNIT PROGRAMME
IN MALAYSIA

The Japanese Evaluation Team (hereinafter referred to as "The Japanese Team") organized by the Japan International Cooperation Agency (hereinafter referred to as "JICA") and headed by Mr. Takahiko Kasama, Deputy Director, Technical Cooperation Division, Mining and Industrial Development Cooperation Department, JICA visited Malaysia from 19 May to 1 June 1993, for the purpose of evaluating jointly with the Malaysian Evaluation Team (hereinafter referred to as "The Malaysian Team") the achievement of the Japanese Technical Cooperation for The Project on the Foundry Technology Unit Programme (hereinafter referred to as "The Project") on the basis of the Record of Discussions signed on 12 October 1988 (hereinafter referred to as "The R/D").

After the Joint Evaluation of The Project, The Japanese Team discussed with the authorities concerned of the Government of Malaysia over the matters for the successful implementation of the Project.

As a result of the discussions, both sides mutually agreed upon the matters referred to in the document attached hereto.

Shah Alam, 1 June 1993



MR. TAKAHIKO KASAMA
Leader
Japanese Evaluation Team
Japan International Cooperation Agency
Japan.



DR. CHONG CHOK NGEЕ
Director of Research and Technology
Development
Standards and Industrial Research
Institute of Malaysia
on behalf of the Secretary General
Ministry of Science, Technology
and the Environment
Malaysia.

ATTACHED DOCUMENT

Recognition of the Joint Evaluation Report

The Joint Committee recognized the Joint Evaluation Report submitted by both Evaluation Teams.

Further Input to The Project Until 11 October 1993

(1) Japanese Side

- 1) To dispatch 1 short-term Expert in Product Development
- 2) To dispatch 1 short-term Expert in Alloy Steel Casting
- 3) To accept 3 counterpart personnel for training in Japan
- 4) To provide the machinery and equipment within the approved allocated budget

(2) Malaysian Side

To provide all the provisions as agreed upon in The R/D.

Requests for Individual Short-Term Japanese Experts After the Japanese Fiscal Year of 1993

The Malaysian Side strongly request for the dispatch of Individual short-term Japanese Experts in the following number of experts and fields of technology after the Japanese Fiscal Year of 1993.

- (1) To dispatch 1 short-term Expert in Design of Castings
- (2) To dispatch 1 short-term Expert in Materials Development
- (3) To dispatch 1 short-term Expert in Pattern Making
- (4) To dispatch 1 short-term Expert in Moulding

in the field of machine tool making, for example drilling machine and lathe machine.

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LIST OF ATTENDANCE

1. Japanese Side

(1) Japanese Evaluation Team

Mr. Takahiko Kasama, Leader
Mr. Koutaro Tanaka, Technical Cooperation Planning
Mr. Toshikazu Oshima, Foundry Quality Control, etc.
Mr. Noriyasu Oe, Moulding, etc.
Mr. Shigeru Otake, Project Evaluation Management

(2) Japanese Experts

Dr. Hideaki Ota, Chief Adviser
Mr. Hiroshi Kanamori, Coordinator
Mr. Katsuhiko Fujihiro, Melting
Mr. Akinaga Ohdaira, Moulding
Mr. Tsuneto Nonaka, Pattern Making

(3) JICA Malaysia Office

Mr. Takao Kaibara

(4) Embassy of Japan

Mr. Hidenao Sawayama

(5)

W/C

2. **Malaysian Side**

(1) Malaysian Evaluation Team

Dr. Chong Chok Ngee - Director, Research and Technology Development
Division, SIRIM
Mr. Helme Hashim - Head, Product and Machine Development Centre,
SIRIM

(2) Ministry of Science, Technology and the Environment

Mr. Ghazali Abdullah

(3) Malaysian Counterparts

Mr. Muhammad Fauzi Ismail
Mr. Mohd Akhir Yeop Kamaruddin
Miss Lee Lay Kuan
Mr. Azmaizam Mohd Zain
Mr. Romzee Ismail
Mr. Rosman Iteng
Mr. Hasnul Akmal Haron

(5)

MC