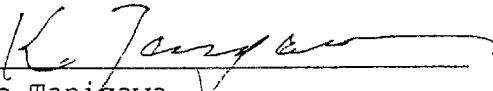


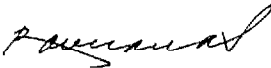
MINUTES OF DISCUSSIONS
ON THE JAPANESE TECHNICAL COOPERATION
FOR THE PROJECT
ON SUPPORTING INDUSTRIES DEVELOPMENT
FOR CASTING TECHNOLOGY
IN THE REPUBLIC OF INDONESIA

The Japanese Implementation Study Team (hereinafter referred to as "the Team") organized by Japan International Cooperation Agency (hereinafter referred to as "JICA") and the Agency for Research and Development of Industry and Trade, Ministry of Industry and Trade signed the Record of Discussions (hereinafter referred to as "R/D") on the Japanese Technical Cooperation for the Project on Supporting Industries Development for Casting Technology in the Republic of Indonesia. The following Minutes of Discussions are intended to record the understanding reached between both sides in regard to the provisions stipulated in R/D.

During its stay in the Republic of Indonesia, the Team exchanged views and had a series of discussions with the authorities concerned of the Government of the Republic of Indonesia. As a result of the discussions, both sides came to reach a common understanding concerning the matters referred to in the document attached hereto.

Jakarta, 15 December 1998


Kazuo Tanigawa
Leader
Implementation Study Team
Japan International
Cooperation Agency
Japan


Rosediana Suharto
Head
Agency for Research and Development
of Industry and Trade
Ministry of Industry and Trade
Republic of Indonesia

Attached Document

1 Name of the Project

Both sides reconfirmed that the name of the Project was the Japanese Technical Cooperation for the Project on Supporting Industries Development for Casting Technology in the Republic of Indonesia.

2 Agency concerned of the Project

Agency for Research and Development of Industry and Trade, (hereinafter referred to as "BPPIP"), Ministry of Industry and Trade (hereinafter referred to as "MOIT") will be an overall responsible agency for the Project.

The Project will be implemented by the Institute for Research and Development of Metal and Machinery Industries (IRDMMI, hereinafter referred to as "MIDC").

The present organization chart of MOIT, BPPIP and MIDC are as shown respectively in Annex 1-1, Annex 1-2 and Annex 1-3.

The Budget of MIDC is as shown in Annex 2.

3 Administration of the Project

Head of BPPIP, as the Project Director, will bear overall responsibility for the administration and implementation of the Project.

Director General of Metal, Machine, Electronic and Multifarious Industry will act as the Vice Project Director.

Head of MIDC, as the Project Manager, will be responsible for the managerial and technical matters of the Project.

The provisional organization chart for the administration of the Project is as shown in Annex 3.

4 Duration of the Japanese Technical Cooperation for the Project

The Team proposed and the Indonesian side agreed that the duration of the Japanese technical cooperation for the Project would be five (5) years from 1 April 1999, considering the duration necessary for procurement of machinery and equipment provided by the Japanese side. However, the Team explained and the Indonesian side understood that training of the Indonesian counterpart personnel in Japan and provision of machinery and equipment would be commenced after the signing of R/D.

5 Site of the Project

The Project will be implemented at MIDC. The address and other information regarding the Project site are as follows:

Address: (MIDC) Jl. Sangkuriang No.12, Bandung,
Republic of Indonesia

Phone: 62-22-2504107

Fax : 62-22-2503978

6 Master Plan of the Project

(1) Concept and Scope of the Project

The Team emphasized and the Indonesian side agreed the importance of setting a clear target of technology upgrading activities of MIDC by identifying and coordinating the target needs of not only foundry industry but also assemblers and other related industries in the Republic of Indonesia, and that MIDC should establish sustainable network of its own for identifying the core needs and for securing feedbacks in its activities. The concept image of the Project is as shown in Annex 4.

(2) Objectives of the Project

Both sides agreed as follows:

(Overall Goal)

Small and medium scale foundry industries will be able to provide domestic assembly industries with casting products to meet their quality level;

(Project Purpose)

Technical services for small and medium scale foundry industries extended by MIDC will be improved.

(3) Outputs of the Project

Both sides agreed as follows:

0. Project operation unit will be enhanced.
1. Machinery and equipment will be provided, installed, operated and maintained properly.
2. Technical capability of the counterpart personnel (hereinafter referred to as "C/P") will be upgraded.
3. Trial prototyping services will be implemented systematically.
4. Technical dissemination services will be implemented systematically.
5. Information services will be implemented systematically.

In this connection, both sides reconfirmed the following:

a Trial prototyping service

- (a) The "trial prototyping service" is coincided with one of research and development activities of MIDC that are conducted upon request from industries in Indonesia basically on a charged basis.
- (b) This activity is extended in the Project to assess the stability and sustainability of the technology transferred to the C/P from the Japanese experts.
- (c) The time and service items will be decided through sufficient consultation between Japanese experts and the C/P before application. Two(2) to three(3) items a year will be a maximum in the Project.
- (d) As this activity is regarded as a trial, the C/P may not reach the level to implement it independently without any guidance of the Japanese experts at the

completion of the Project, C/P will be required to continue the self-learning after completion.

- (e) The tentative list of candidate prototypical products is as shown in Annex 5 and it is to be considered in selecting an actual client company for trial prototyping service according to market needs.

b Technology dissemination service

The purpose of the "technology dissemination service" is to disseminate the casting technology to the small and medium scale foundry industries.

It mostly means the extension service in and out of Bandung by both the Indonesian C/P and the Japanese experts although other dissemination measures can be included through sufficient consultation between Japanese experts and the C/P.

c Information service

The purpose of "information service" is;

- (a) To collect and compile technical information and material in MIDC
- (b) To provide industries with technical information and material through seminars, publications and other measures

(4) Activities of the Project

Both sides agreed as follows:

- 0-1 Allocate necessary personnel.
- 0-2 Make plans of activities.
- 0-3 Make budget plan and execute properly.
- 0-4 Establish and operate management system.

Note: The said system includes the following:

- (a) Organization
 - Joint Coordinating Committee
 - (b) Linkage with industries including the industrial association, institute, academy and so on
 - (c) Regular Meeting
 - within the Project
 - with the organization/personnel concerned
 - (d) Regulation
 - (e) Monitoring System
 - (f) Implementation System from need survey, planning, implementation, evaluation and feed back
 - (g) Public Relations
- 1-1 Make facility refurbishment plan and implement as planned.
 - 1-2 Provide and install machinery and equipment.
 - 1-3 Operate and maintain the machinery and equipment properly.
 - 2-1 Make Technical Cooperation Program.
 - 2-2 Implement technology transfer to the C/P.
 - 2-3 Monitor and evaluate the technology transfer to the C/P.
 - 3-1 Make plan of trial prototyping services.

- 3-2 Implement the trial prototyping services.
- 3-3 Monitor and evaluate the trial prototyping services.
- 4-1 Make plan of technical dissemination services.
- 4-2 Implement the technical dissemination services.
- 4-3 Monitor and evaluate the technical dissemination services.
- 5-1 Make plan of information services.
- 5-2 Collect and compile technical information and material.
- 5-3 Provide industries with technical information and material.
- 5-4 Monitor and evaluate the information services.

7 Project Cycle Management (PCM)

Both sides drew up the draft Project Design Matrix (hereinafter referred to as "PDM") as shown in Annex 6.

Furthermore, both sides agreed on the following:

- a Project planning and concept clarification method entitled Project Cycle Management (hereinafter referred to as "PCM") will be applied to the Project to monitor and evaluate the level of the achievement and enhance the communication for its smooth implementation;
- b PDM should continue to be reviewed as the common reference/communication tool to realize the PCM and discussed further by the end of the six (6) months of the duration of the Project between the Indonesian side and the Japanese experts.

8 Fields and Items of Technology Transfer

(1) Target Group

The initial target group of the Project is the C/P. As the Project proceeds, the target group may cover small and medium scale foundry industry in the Republic of Indonesia.

(2) Target Castings for Technology Transfer

The Team proposed and the Indonesian side agreed upon the following:

- a The target castings should be set up to be used as tools for technology transfer from Japanese experts to C/P;
- b The purpose and merit for their introduction is to monitor the technical level of MIDC as follows:
 - (a) Their introduction enables both sides to monitor the achievement of the said technology transfer with a bird's eye view, that is, to monitor the technical level of MIDC, not that of respective group of C/P.
 - (b) The levels of the target castings are set forth so that C/P is able systematically and comprehensively to learn core technical elements necessary for producing high quality castings such as dimension accuracy, edge perfection, soundness, mechanical properties and so forth through production exercises of each target castings.

(c) The tentative long list of the target castings are as shown in Annex 7.

(3) Fields of Technology Transfer

Both sides confirmed that the technology transfer for the Project would be implemented in the following fields and details of which were as compiled in the draft Technical Cooperation Program (hereinafter referred to as "TCP") as shown in Annex 8:

- a Casting Plan
- b Pattern Making
- c Melting
- d Moulding
- e Testing

Quality Improvement is included in the above a - e fields respectively to implement smooth technology transfer.

Both sides further worked out the draft Plan of Operations (hereinafter referred to as "PO") as shown in Annex 9.

(4) Methodology of Technology Transfer

The previous three Supplementary Study Teams conducted the assessment of the capability of each C/P through accompanying the field surveys, skill check-ups and interviews.

Both sides agreed that sufficient working time of the technical C/P should be secured for the technology transfer in the form such as lectures at workshop style, hands-on training with the factory visits, daily on-the-job training and self-practice especially at the initial stage of the Project. In case of the dispatch of the short term experts, the time allocation of the C/P to the Project would be made in flexible manner to make the best use of the dispatch of the said experts.

The detailed schedule for time allocation of each C/P is to be finalized by six (6) months after the commencement of the Project.

9 Measures to be taken by the Japanese side

(1) Dispatch of Japanese Experts

The Team explained and the Indonesian side agreed that the following Japanese experts would be dispatched in compliance with the fields as stipulated in Article 8(3):

- a Long-term Experts
 - (a) Chief Advisor
 - (b) Coordinator
 - (c) Casting Plan / Melting
 - (d) Pattern Making
 - (e) Moulding

The fields of long-term experts are subject to change including the reason of the recruitment of the experts.

- b Short-term Experts

Short-term experts will be dispatched on specific fields in relation to the fields of technology transfer as necessity arises.

(2) Training of the Indonesian Counterpart Personnel in Japan

The Team explained and the Indonesian side understood that a certain number of the Indonesian C/P would be accepted for training in Japan during the cooperation period according to the following program:

a Number

A certain number (1-3 persons) yearly (subject to change by budgetary appropriation of JICA);

b Term and timing

The term will be discussed further between Japanese experts and the Indonesian side, however at most three (3) months will be appropriate, taking into consideration the budgetary appropriation of JICA as well as the existence of long-term experts in the Project site.

The timing of the training will be discussed by both sides, however, some of the training may be implemented before the dispatch of experts in view of the efficiency of the technology transfer.

c Fields

Details of training contents will be discussed further by both sides.

d Methodology

Training of the C/P in Japan aims mainly at complementing the technology transferred by the experts in MIDC, the examples of which are described as follows:

- (a) To expose the production line in the Japanese private company and thus get an image of production management;
- (b) To visit the public institution and other organizations which play the same roles that MIDC is expected to play.

The Team further requested and the Indonesian side agreed that, as a matter of course, the C/P may apply to other training courses provided by JICA or any other organizations, however, sufficient consultation should be held between the Japanese experts and the C/P before the application to avoid impeding the smooth implementation of the Project.

(3) Provision of Machinery and Equipment

The Team explained and the Indonesian side understood that any machinery and equipment provided by the Japanese side should be regarded as only a tool and material to accomplish the technology transfer for the Project, and thus minimum provision would be made and the future version-up or replacement even during the Project should be borne by the Indonesian side.

Taking the above principle into consideration, both sides revised the list of the machinery, equipment and other materials (hereinafter referred to as "the Equipment") necessary for the implementation of the Project as shown in Annex 10.

The Team further explained and the Indonesian side agreed that the cost and responsibility necessary for domestic transport, installation and maintenance of the Equipment should be borne by the Indonesian side.

The Team, in addition, stated that the Japanese side would consider dispatch of experts for the supervision on the installation of the Equipment, if necessary.

(4) Special Measures

With reference to the utilization of special measures through JICA with the purpose of supplementing a portion of the local cost expenditures necessary for construction of expansion of power station at MIDC to be used for the Foundry Shop, it may be discussed mutually between both sides depending upon the budgetary allocation on the Indonesian side.

10 Measures to be taken by the Indonesian side

(1) Buildings and Facilities for the Project

The Indonesian side will make available the buildings and facilities of MIDC for the implementation of the Project.

In this connection, both sides confirmed that all the equipment for the Project would be installed in the Foundry Shop in MIDC.

The Indonesian side agreed to implement the necessary renovation of the Foundry Shop and relocation of some of the existing equipment whose cost are shown in Annex 11.

The present layout of the Foundry Shop is as shown in Annex 12. The Indonesian side explained to the Team that any changes in floor plans of the Foundry Shop would be informed to the Japanese side as it was confirmed.

(2) The Office Space for the Japanese experts

The Offices for the Chief Advisor and the Coordinator will be prepared in the main building of MIDC while the offices for the other experts will be prepared in the Foundry Shop before the commencement of the Project and be equipped properly with office equipment necessary to conduct the Project such as phones, desks and illumination.

In this connection, both sides agreed that, to secure the smooth communication, the other experts should share the rooms with their C/P.

Furthermore, the Team commented that new direct telephone lines should be provided for the office space, hopefully two(2) more lines, and the Indonesian side promised to make

the best effort.

(3) Machinery, Equipment and Materials

The Indonesian side will supply or replace at its own expenses machinery, equipment, instruments, vehicles, tools, spare parts and any other materials necessary for the implementation of the Project other than those provided by the Government of Japan through JICA as shown in Annex 10.

(4) Assignment of Full-Time C/P

For the successful implementation of the Project, the Indonesian side will provide the services of the C/P and administrative personnel as listed in Annex 13.

In this connection, the Team requested and the Indonesian side agreed that other ongoing projects such as the Industrial Technology and Human Resources Development (ITHRD) Project by Asian Development Bank (ADB) loan and the Joint Research on Precision Working of Casting Technology for Industrial Pump Components with National Industrial Research Institute of Nagoya (NIRIN) would not influence the JICA Project in terms of the assignment of the technical C/P. Tentative allocation plan of C/P is shown as Annex 14.

Should the allocation of the C/P be changed for either the personnel or administrative reasons, the Indonesian side will immediately take necessary measures to supplementarily assign appropriate number of personnel as the C/P for the Project.

(5) Local Cost

The Team explained and the Indonesian side agreed that the Indonesian side should make its best effort to bear necessary local cost for the implementation of the Project as shown in Annex 2.

(6) Publicity

Both sides agreed that the intensive publicity on the Project would be implemented by making best use of all communication tools as follows:

a Within the six (6) months from the commencement of the Project

The first edition of leaflet for the Project, which are written at least both in English and Indonesian, should be prepared by the collaboration of Japanese experts and the C/P, thus, any person/organization concerned with the Project can get a certain image of the Project.

b Opening Ceremony

When the main equipment are delivered, installed and possibly operated by the C/P, opening ceremony should be held with attendants from organizations concerned as well as from mass-media, accompanying the completion of

pamphlet of the Project as well as the supplements of newspaper.

- c Joint Coordinating Committee and other important activities

Aside from the memorial occasion, integrated public relation should be implemented timely as well as regularly, e.g., Joint Coordinating Committee as described in the following Article, training and seminars and so on.

11 Joint Coordinating Committee

Both sides agreed that, for the effective and successful implementation of technical cooperation for the Project, a Joint Coordinating Committee would be established whose functions and composition are described in Annex VI of R/D.

The Team commented and the Indonesian side agreed that in addition to the said Committee, regular meetings should be held within the Project.

12 Joint Evaluation

The final evaluation of the Project will be conducted jointly by both sides through JICA approximately six(6) months before the termination of the cooperation period in order to examine the level of achievement of the objectives of the Project.

Other evaluations may be conducted when necessary during and after the cooperation period to better monitor the progress and sustainability the Project.

In this regard, the Team explained the methodology of evaluation, especially five(5) basic evaluation components as shown in Annex 15.

13 Progress of ITHRD-ADB Project

MIDC expects to receive calibration, testing, machining and welding equipments in March in 1999. In 2000 and 2001, project activities such as procurement of foundry equipment which is listed in Annex 16 and training for ITHRD project will be conducted consecutively. The said list will be revised to complement the machinery provided by JICA by April 1999 when MIDC will submit it to ADB for tender.

14 Involvement of the Industrial Sector and Educational Sector

Both sides confirmed that the involvement of the industrial sector was indispensable for the successful implementation of the Project as described above.

15 Schedule of the Project

Both sides formulated the Tentative Schedule of Implementation (hereinafter referred to as "TSI") for the Project as shown in Annex 17.

16 Annual Plan of the Project

Both sides worked out the draft Annual Plan of Operations (hereinafter referred to as "APO") in the Fiscal Years 1998 and 1999 as shown in Annex 18.

In line with APO, both sides agreed that, on condition that the budgetary allocation was subject to change, the input by the Japanese side in the Fiscal Years 1998 and 1999 would be as below:

(1) Dispatch of Japanese Experts in the Fiscal Year 1999

a Long-term Experts

- (a) Chief Advisor
- (b) Coordinator
- (c) Casting Plan / Melting
- (d) Pattern Making
- (e) Moulding

The experts mentioned above will be dispatched at an earlier date after the commencement of the cooperation period.

The fields of long-term experts and the timing of dispatching the experts are subject to change including the reason of the recruitment of the experts.

b Short-term Experts

Both sides confirmed the field and the timing of dispatch of short-term experts in the Fiscal Year 1999 would be as the following. The Team commented and the Indonesian side agreed that it was tentative and subject to change including the reason of the recruitment of the expert:

- (a) Machinery Installation (Moulding System)
- (b) Machinery Installation (Organic No-bake Moulding System)
- (c) Machinery Installation and Maintenance System
- (d) Lecturer on Seminar
- (e) Others

Short-term experts on other specific fields in relation to the fields of technology transfer will be dispatched as necessity arises.

(2) Training of Indonesian C/P in Japan in the Fiscal Years 1998 and 1999

a Fiscal Year 1998

- (a) Project Management two(2) persons

The timing of the training in Japan will be 4th quarter of the Fiscal Year 1998.

b Fiscal Year 1999

- (a) Pattern Making two(2) persons
- (b) Moulding one(1) person
- (c) Testing zero(0) or one(1) person

The fields and the timing of training of C/P in Japan

will be further discussed by both sides.

(3) Provision of Machinery and Equipment in the Fiscal Years 1998 and 1999

The expected timing of the delivery of main machinery and equipment, such as moulding system and high frequency induction furnace, will be 3rd or 4th quarter of the Fiscal Year 1999. The Team commented and the Indonesian side understood that it was tentative and subject to change.

(4) Dispatch of Management Consultation Team

The Team explained and the Indonesian side understood that the Japanese side was planning to dispatch the Management Consultation Team for the purpose of the following:

- a To advise the preparation work for the power station and machinery installation such as civil work, local procurement and detailed design
- b To conduct extension services and needs survey in and out of Bandung by the candidates of Japanese long-term experts and the Indonesian C/P
- c To hold a seminar on casting technology, if possible

The expected timing of dispatch of the Management Consultation Team will be 4th quarter of the Fiscal Year 1998.

17 Others

(1) Both sides reconfirmed that the common language used in any activities of the Project should be English.

(2) The Team explained and the Indonesian side understood the nature and scheme of the Project-Type Technical Cooperation by the Government of Japan, including the request forms, such as Form A1, Form A2A3, Form A4 and the R/D.

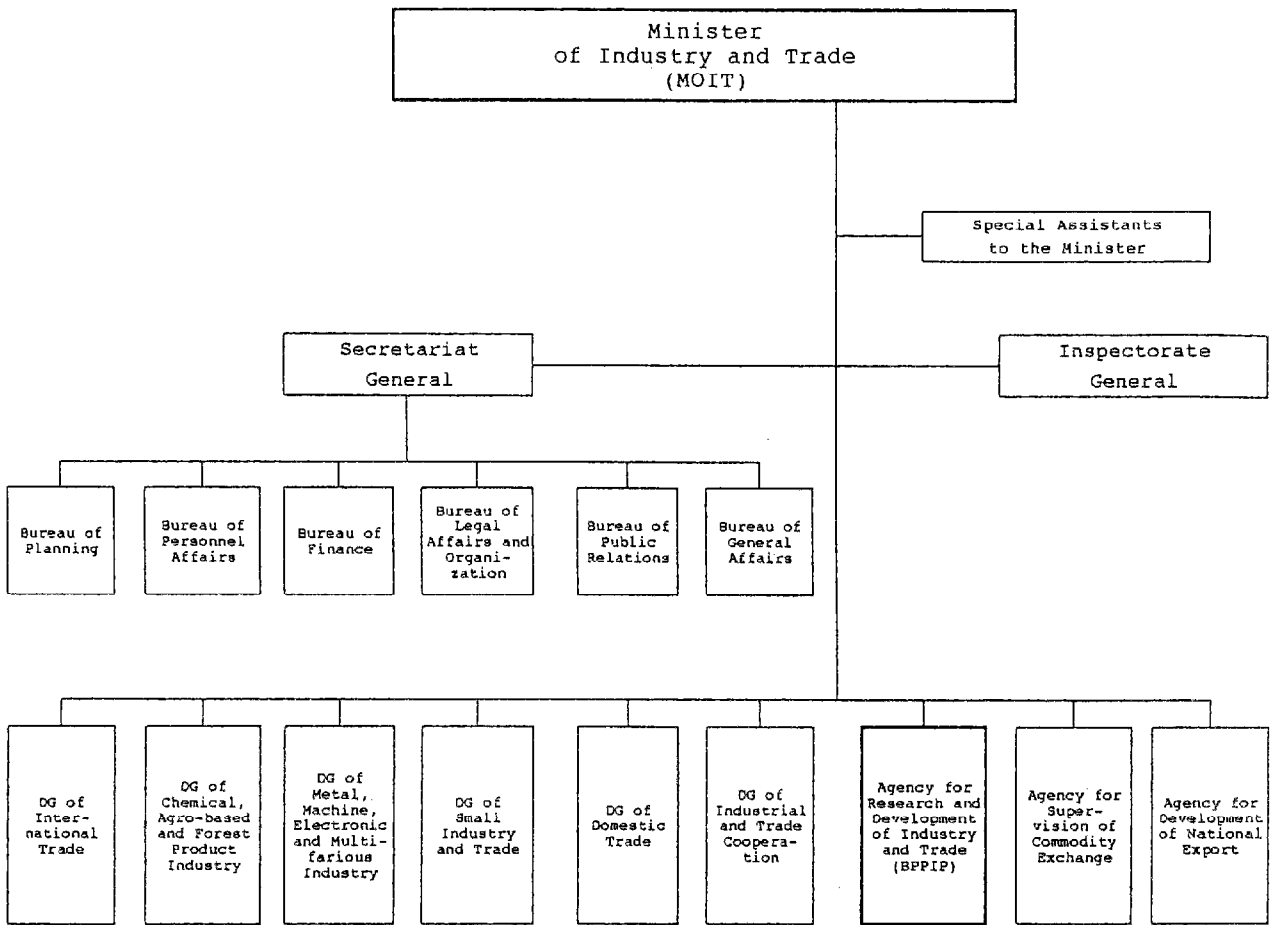
In this connection, the Team requested the Indonesian side that the said Forms necessary for the activities implemented in the initial stage of the Project should be handed to the Team in advance before their departure from Indonesia for the smooth implementation of the Project.

(3) A list of attendants of the discussions is as shown in Annex 19:

List of Annexes

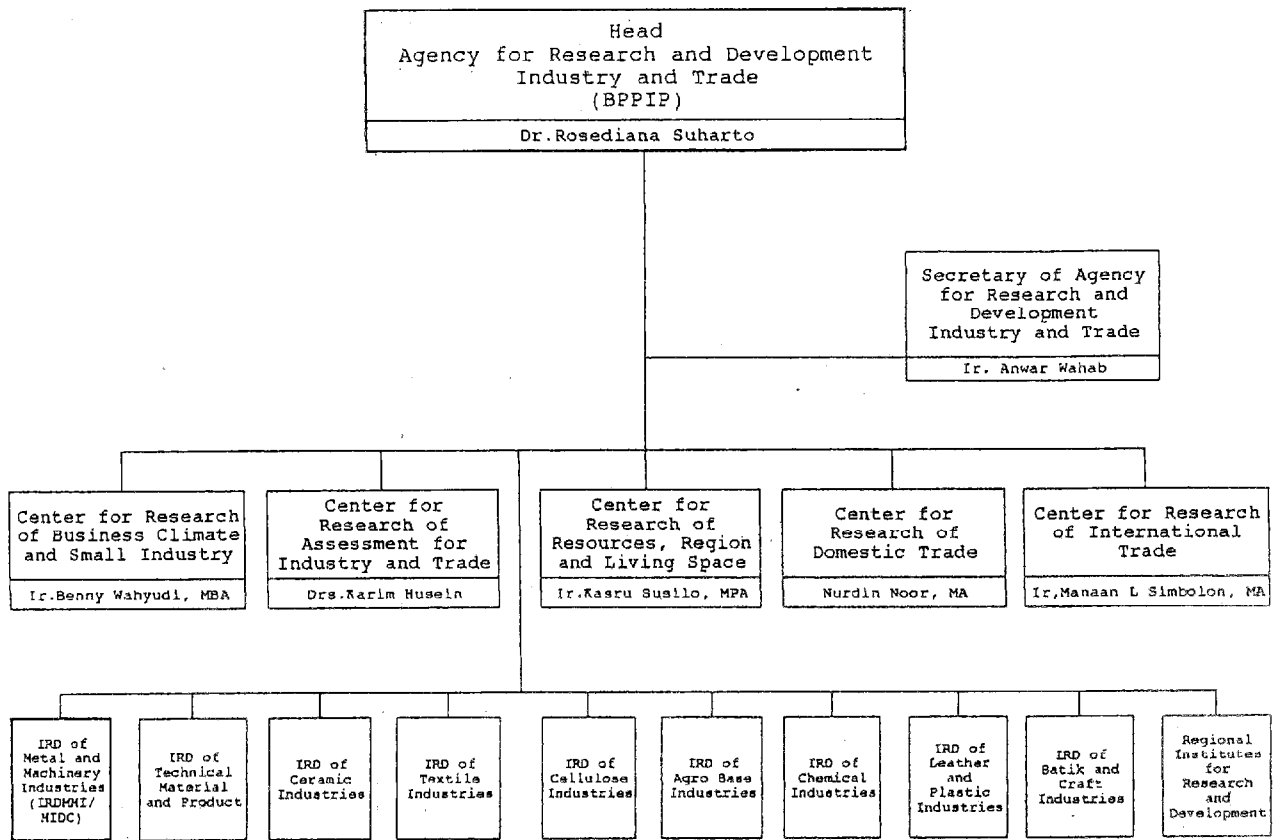
- Annex 1-1 Organization Chart of MOIT
- Annex 1-2 Organization Chart of BPPIP
- Annex 1-3 Organization Chart of MIDC
- Annex 2 Budgetary Allocation of MIDC
- Annex 3 Provisional Organization Chart for the Administration of the Project
- Annex 4 Concept Image of the Project
- Annex 5 Tentative List of Candidate Prototypical Products to be considered for Trial Prototyping Service
- Annex 6 Project Design Matrix (PDM) (Draft)
- Annex 7 Long List of Target Castings (Provisional)
- Annex 8 Technical Cooperation Program (TCP) (Draft)
- Annex 9 Plan of Operations (PO) (Draft)
- Annex 10 Provisional List of the Equipment Necessary for the Implementation of the Project
- Annex 11 Estimated Cost for Preparation of Equipment of JICA-Project
- Annex 12 Present Layout of the Foundry Shop in MIDC
- Annex 13 List of JICA's Counterpart Personnel
- Annex 14 Tentative Allocation Plan of Counterpart Personnel
- Annex 15 Five Basic Evaluation Components
- Annex 16 ITHRD-Project ADB Loan - Foundry Equipment
- Annex 17 Tentative Schedule of Implementation (TSI)
- Annex 18 Annual Plan of Operations (APO) (Draft)
- Annex 19 List of Attendants of the Discussions

Annex 1-1 Organization Chart of MOIT



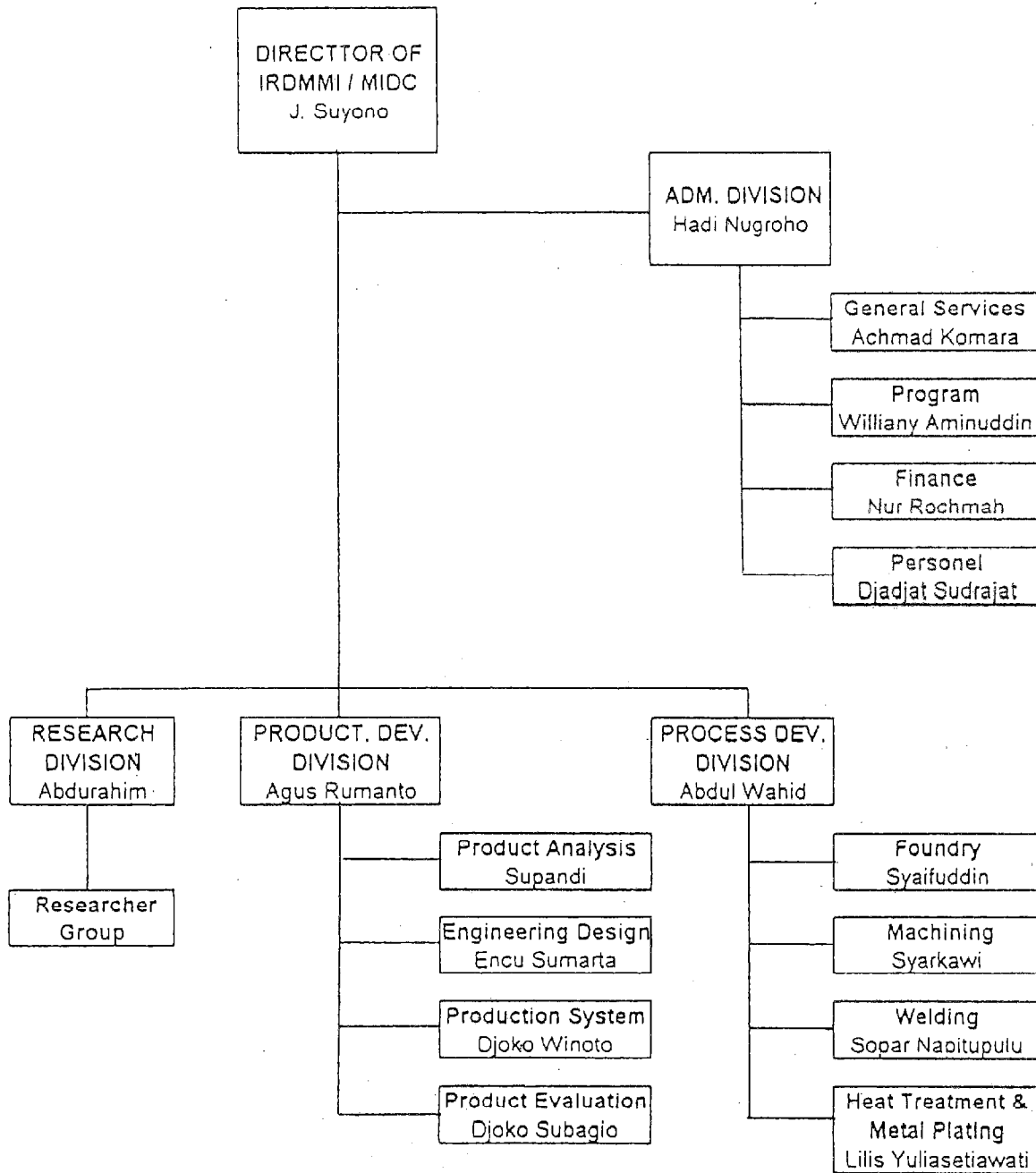
Note) DG: Directorate General
 Provisionally Translated by the Team

Annex 1-2 Organization Chart of BPPIP



Note) IRD: Institute for Research and Development
Provisionally Translated by the Team

Annex 1-3 ORGANIZATION CHART OF IRDMMI / MIDC



Annex 2 Budgetary Allocation of MIDC

I MIDC Budget

(Unit: 1,000 Rp.)

Past	1994/95		1995/96		1996/97		1997/98	
	Allocated	Spent	Allocated	Spent	Allocated	Spent	Allocated	Spent
1. Routine	1,179,250	1,171,600	1,337,254	1,305,500	1,507,975	1,475,255	1,638,780	1,679,300
2. Development	396,836	389,576	559,052	479,831	1,619,999	1,529,085	1,606,349	1,579,549
JICA	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.	62,600	61,800
ADB	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.	272,900	252,400
NIRIN	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.	47,100	46,700
Others	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.	1,223,749	1,218,649
3. Service	1,050,000	1,000,000	1,280,000	1,200,000	1,100,000	1,025,000	1,250,000	1,210,000
TOTAL (1+2+3)	2,626,086	2,561,176	3,176,306	2,985,331	4,227,974	4,029,340	4,495,129	4,468,849

Present	1998/99	
	Allocated	Spent by November
1. Routine	1,724,297	1,120,600
2. Development	994,850	395,500
JICA	58,100	22,700
ADB	487,500	33,400
NIRIN	37,500	34,200
Others	411,750	305,200
3. Service	1,800,000	700,000
TOTAL (1+2+3)	4,519,147	2,216,100

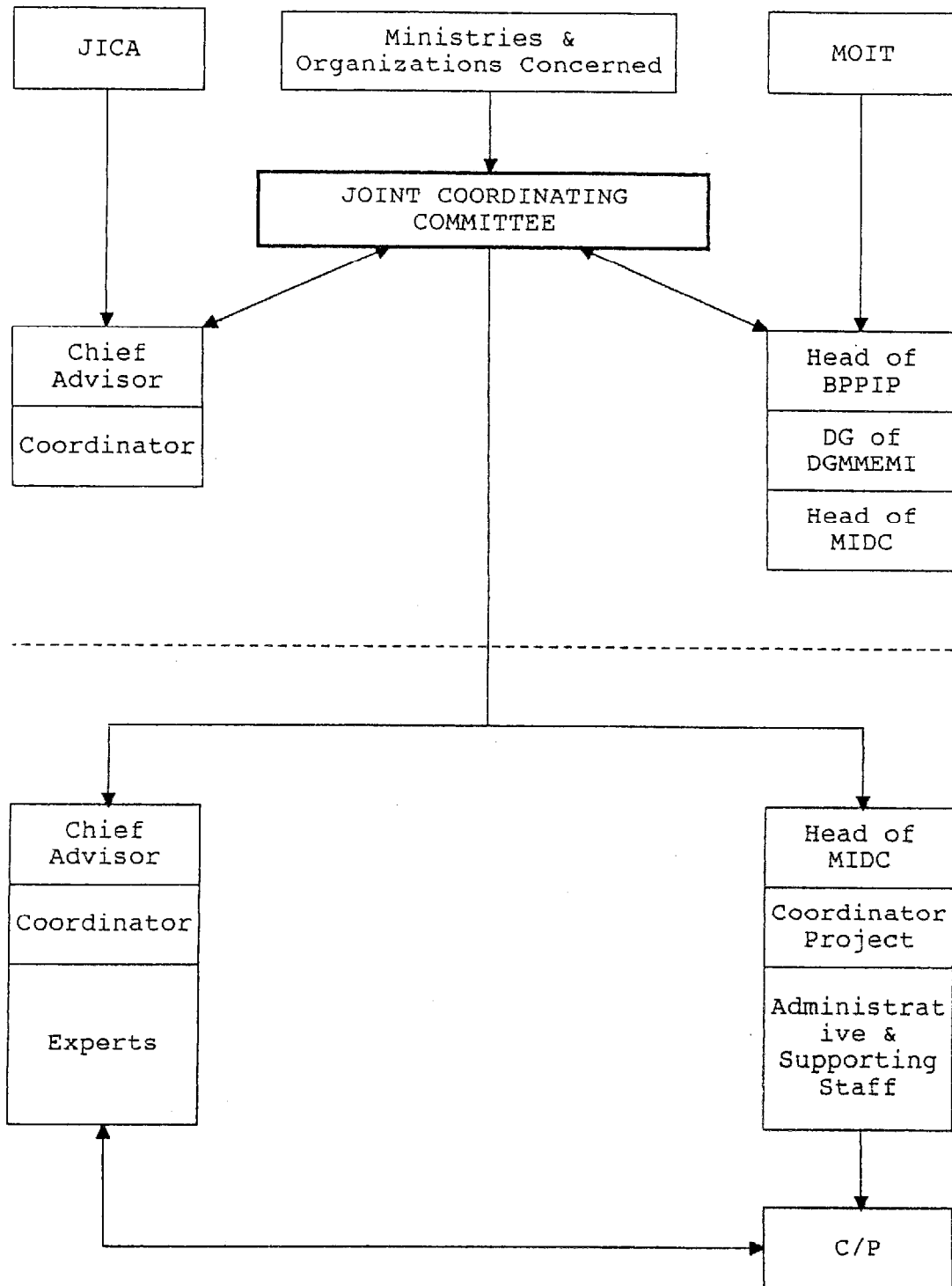
Future	1999/2000	2000/01	2001/02	2002/03	2003/04
	Proposed	Plan	Plan	Plan	Plan
1. Routine	2,061,620	2,200,000	2,400,000	2,700,000	3,000,000
2. Development	2,621,400	3,258,400	3,717,300	4,360,000	N.A.
JICA*	155,600	325,000	305,000	105,000	N.A.
ADB	1,409,000	N.A.	N.A.	N.A.	N.A.
NIRIN	86,400	N.A.	N.A.	N.A.	N.A.
Others	970,400	N.A.	N.A.	N.A.	N.A.
3. Service	1,900,000	1,950,000	2,000,000	2,100,000	2,200,000
TOTAL (1+2+3)	6,583,020	7,408,400	8,117,300	9,160,000	N.A.

II MIDC Budget for the Project

for the JICA Project	1998/99		1999/2000	2000/01	2001/02	2002/03	2003/04
	Allocated	Spent by November	Proposed*	Plan	Plan	Plan	Plan
1. Honoraria	27,400	17,630	39,200	N.A.	N.A.	N.A.	N.A.
2. Material	1,000	990	25,000	N.A.	N.A.	N.A.	N.A.
3. Travel	4,200	4,080	30,000	N.A.	N.A.	N.A.	N.A.
4. Others	25,500	0	61,400	N.A.	N.A.	N.A.	N.A.
Handling	N.A.	N.A.	55,400	N.A.	N.A.	N.A.	N.A.
Testing	N.A.	N.A.	5,000	N.A.	N.A.	N.A.	N.A.
Reporting	N.A.	N.A.	1,000	N.A.	N.A.	N.A.	N.A.
TOTAL (1+2+3+4)	58,100	22,700	155,600	325,000	305,000	105,000	N.A.

*Note: The amount of 150,000,000 Rp. will be added to the JICA Development Budget 1999/2000 for the building cost (civil work for and installation of machinery provided by JICA) and further budget allocation will be applied by MIDC to fulfill the above cost

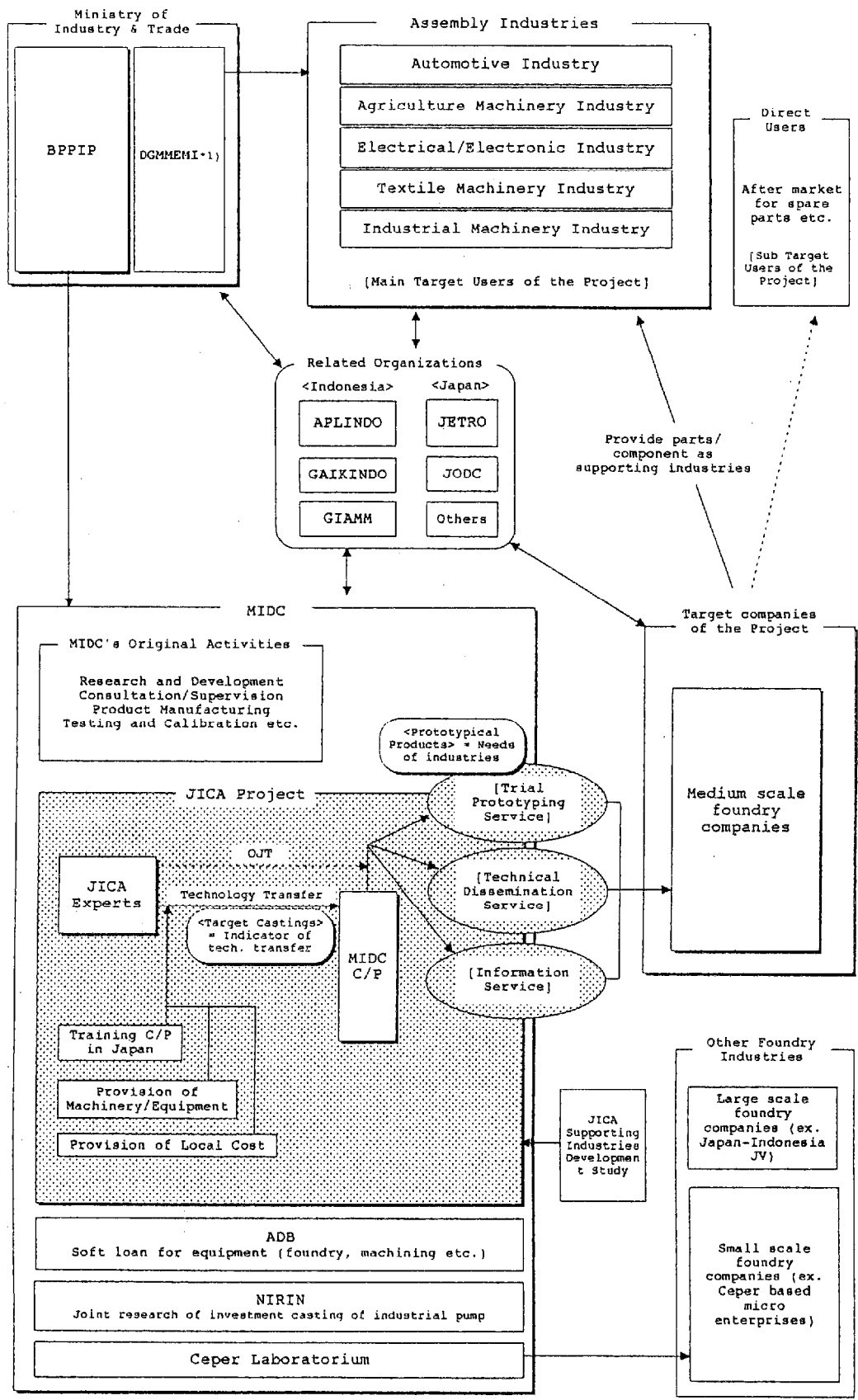
Annex 3 The Provisional Organization Chart
for the Administration of the Project



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Annex 4 The Concept Image of the Project
on Supporting Industries Development for Casting Technology
in the Republic of Indonesia



*1) DGMMEMI: Directorate General of Metal, Machine, Electronic and Multifarious Industry

**Annex 5 Tentative List of Candidate Prototypical Products
to be Considered for Trial Prototyping Service**

1 Automotive Components

- (1) Brake Drum
- (2) Brake Disc
- (3) Clutch Pressure Hub
- (4) Clutch Pressure Plate
- (5) Master Brake Cylinder
- (6) Brake Wheel Cylinder
- (7) Camshaft
- (8) Front Wheel Hub
- (9) Gear Transmission Housing

2 Agricultural Machinery Components

- (1) Flywheel
- (2) Flywheel Casing

3 Electrical Components

- (1) Insulator Hanger
- (2) Motor End Bracket
- (3) Motor Housing

4 Textile machinery Components

- (1) Lever
- (2) Cam
- (3) Gear

Note: This list is tentative and the candidate prototypical products will be studied further.
See the Article 6(3)a.

Annex 6 Draft Project Design Matrix (PDM)

Project on Supporting Industries Development for Casting Technology in the Republic of Indonesia

Narrative Summary	Verifiable Indicators	Means of Verification	Important Assumptions
(Overall Goal) Small and medium scale foundry industries will be able to provide domestic assembly industries with casting products to meet their quality level.	1. Increase of production delivered to assembly industries 2. Improvement of quality of products 3. Improvement of productivity and efficiency	1,2,3. Survey reports on foundry industries, questionnaires to and interviews with related industries	a. There is no drastic change in the politic and economic situation in Indonesia. b. Supporting industries development policy will continue to be stable. c. Demand for Indonesian casting products will continue to be stable.
(Project Purpose) Technical services for small and medium scale foundry industries extended by MIDC will be improved.	1. Level of satisfaction of present and former service beneficiaries 2. Level of satisfaction of industries 3. Number of newly improved services and targeted group.	1,2. Questionnaires to and interviews with related industries 3. MIDC records	a. Indonesian foundry industries will utilize the technology obtained from MIDC. b. Linkage between assembly and supporting industries will be established.
(Outputs of the Project) 0. Project operation unit will be enhanced. 1. Machinery and equipment will be provided, installed, operated and maintained properly. 2. Technical capability of the counterpart personnel (hereinafter referred to as "C/P") will be upgraded. 3. Trial prototyping services will be implemented systematically. 4. Technical dissemination services will be implemented systematically. 5. Information services will be implemented systematically.	0. Number and capability of staff, budget, established management system 1. Contents and conditions of machinery and equipment, route to get spare parts and situation to secure spare parts 2. Assessment by the Japanese experts, number of achieved Target Products for Technology Transfer 3. Number of implemented trial prototyping services 4. Number of implemented technical dissemination services, number of clients 5. Number of implemented information services, number of beneficiaries, number of participants	0. Organization chart, personnel record, accounting record and administration record 1. Machinery and equipment list, operation and maintenance record 2,3,4,5. MIDC records	a. Trained C/P will remain at MIDC.
(Activities) 0-1 Allocate necessary personnel. 0-2 Make plans of activities. 0-3 Make budget plan and execute properly. 0-4 Establish and operate management system. 1-1 Make facility refurbishment plan and implement as planned. 1-2 Provide and install machinery and equipment. 1-3 Operate and maintain the machinery and equipment properly. 2-1 Make Technical Cooperation Program. 2-2 Implement technology transfer to the C/P. 2-3 Monitor and evaluate the technology transfer to the C/P. 3-1 Make plan of trial prototyping services. 3-2 Implement the trial prototyping services. 3-3 Monitor and evaluate the trial prototyping services. 4-1 Make plan of technical dissemination services. 4-2 Implement the technical dissemination services. 4-3 Monitor and evaluate the technical dissemination services. 5-1 Make plan of information services. 5-2 Collect and compile technical information and material. 5-3 Provide industries with technical information and material. 5-4 Monitor and evaluate the information services.	Inputs		a. C/P will remain at MIDC. (Preconditions) a. Utilities of the Project site will be stably provided. b. Foundry industries will be cooperative to the Project.
	Indonesian side	Japanese side	
	1. Renovation, provision and maintenance of building and facilities 2. Allocation of C/P and administrative personnel 2-1. C/P a. Administrative C/P b. Technical C/P 2-2. Supporting staff a. Technical staff b. Administrative staff c. Any other personnel for smooth implementation of the Project 3. Provision and maintenance of machinery and equipment 4. Budgetary allocation of local cost necessary for implementation of the Project	1. Dispatch of Japanese experts 1-1. Long-term experts a. Chief advisor b. Coordinator c. Experts on casting 1-2. Short-term experts in the specific fields of technology may be dispatched, if necessary. 2. Indonesian C/P training in Japan - A certain number of C/P per fiscal year 3. Provision of machinery and equipment 4. Budgetary allocation for supporting local cost	

Annex 7 Long List of Target Castings (Provisional)

Step	Target factors		Castings
1	Dimension accuracy (Length & thickness)	Permissible tolerance is fixed with specification. ⁽¹⁾ Tolerance is affected by pattern accuracy, mould accuracy or sand rigidity Sand rigidity is affected by ramming method.	1) Lever for textile machinery (FC) 2) Flywheel for small diesel engine (FC) 3) Bearing cap (FC, Multi-pieces mould design)
2	Edge perfection	Edge at parting line is easy to collapse at drawing of mould. Collapsed sand is susceptible to the cause of sand inclusion. Collapsed portion in the castings tends to much dressing.	4) Brake drum for vehicle (FC) 5) Medium size bent pipe (FC) 6) Pulleys for crane and others (FC, FCD)
3	Soundness (no internal nor external shrinkage)	Casting design, mould rigidity, metal composition and melt treatment such as inoculation tends to effect on soundness. Thickness change in a casting tends to cause shrinkage defect.	7) Bracket for vehicle alternator (FCD) 8) Differential gear casing for vehicle (FCD) 9) Frame for small machine tool (FC)
4	Accurate core application (even thickness) Complicated shape	Accurate pattern homogeneous mould hardness Core and mould setting should be done accurate.	10) Valve body for water supply (FC) 11) Differential gear casing for vehicle (FCD) 12) Casing & impeller for irrigation pump (FC)
5	Proper mechanical properties and micro-structure and inner soundness fit in specification	All of factors concerned to casting quality	13) Rice milling machine (Alloyed FC) 14) Bearing for textile machinery (FCD) 15) Cover & frame for manhole (FCD)

Annex 8 Technical Cooperation Program (TCP) (Draft)

Project on Supporting Industries Development for Casting Technology in the Republic of Indonesia

Calendar year	1998				1999				2000				2001				2002				2003				2004
Fiscal Year	1998				1999				2000				2001				2002				2003				
	I	II	III	IV	I	II	III	IV	I	II	III	IV	I	II	III	IV	I	II	III	IV	I	II	III	IV	I
Term of Technical Cooperation	Signing of R/D ▼																								
(PO 2-2) implement technology transfer to the C/P.	_____																								
1. Casting Plan	_____																								
1-1 Understanding of drawings	_____																								
1-2 Pattern plan	_____																								
1-3 Riser system plan	_____																								
1-4 Gating system plan	_____																								
1-5 Moulding plan including moulding sand selection	_____																								
1-6 Casting Design Optimizing	_____																								
2. Pattern Making	_____																								
2-1 Understanding of drawings	_____																								
2-2 Pattern making design	_____																								
2-3 Full scale drawing	_____																								
2-4 Operation and maintenance of machinery and equipment	_____																								
2-5 Operation and maintenance of hand tools	_____																								
2-6 Wooden Pattern making	_____																								
2-7 Resin Pattern making	_____																								
2-8 Inspection of pattern	_____																								
2-9 Storage and repairing of pattern	_____																								
3. Melting	_____																								
3-1 Selection and storage of materials	_____																								
3-2 Mixing ratio calculation	_____																								
3-3 Materials charging and melting operation	_____																								
3-4 Melting treatment	_____																								
3-5 Melting test	_____																								
3-6 Maintenance of furnace and ladles	_____																								
4. Moulding	_____																								
4-1 Sand preparation	_____																								
4-1-1 Selection of sand and other materials	_____																								
4-1-2 Sand mixing	_____																								
4-1-3 Sand reclamation	_____																								
4-1-4 Sand testing	_____																								
4-2 Moulding	_____																								
4-2-1 Hand moulding with green sand	_____																								
4-2-2 Machine moulding with green sand	_____																								
4-2-3 Moulding with organic sand	_____																								
4-2-4 Core making	_____																								
4-3 Pouring	_____																								
4-4 Finishing	_____																								
4-4-1 Shaking out	_____																								
4-4-2 Shot blasting	_____																								
4-4-3 Fettling	_____																								
5. Testing	_____																								
5-1 Micro structure test	_____																								
5-2 Mechanical property test	_____																								
5-3 Dimensional test	_____																								
5-4 Visual examination	_____																								
5-5 Liquid penetrant test for surface defects	_____																								
5-6 Statistical Quality Control	_____																								

Note: This schedule is subject to change in accordance with the progress of the Project.

Annex 9 Plan of Operations (PO) (Draft)
 Project on Supporting Industries Development for Casting Technology in the Republic of Indonesia

Calendar Year	1999				2000				2001				2002				2003				2004
Fiscal Year	98	1999			2000				2001				2002				2003				
	III	IV	I	II	III	IV	I	II	III	IV	I	II	III	IV	I	II	III	IV	I		
Term of Technical Cooperation	Signing of R/C																				
0. Project operation unit will be enhanced.																					
0-1 Allocate necessary personnel.																					
0-2 Make plans of activities.																					
0-3 Make budget plan and execute properly.																					
0-4 Establish and operate management system.																					
1. Machinery and equipment will be provided, installed, operated and maintained properly.																					
1-1 Make facility refurbishment plan and implement as planned.																					
1-2 Provide and install machinery and equipment.																					
1-3 Operate and maintain the machinery and equipment properly.																					
2. Technical capability of the counterpart personnel (hereinafter referred to as "C/P") will be upgraded.																					
2-1 Make Technical Cooperation Program.																					
2-2 Implement technology transfer to the C/P.																					
2-3 Monitor and evaluate the technology transfer to the C/P.																					
3. Trial prototyping services will be implemented systematically.																					
3-1 Make plan of trial prototyping services.																					
3-2 Implement the trial prototyping services.																					
3-3 Monitor and evaluate the trial prototyping services.																					
4. Technical dissemination services will be implemented systematically.																					
4-1 Make plan of technical dissemination services.																					
4-2 Implement the technical dissemination services.																					
4-3 Monitor and evaluate the technical dissemination services.																					
5. Information services will be implemented systematically.																					
5-1 Make plan of information services.																					
5-2 Collect and compile technical information and material.																					
5-3 Provide industries with technical information and material.																					
5-4 Monitor and evaluate the information services.																					

Note:
 1 This schedule is subject to change in accordance with the progress of the Project.
 2 The line of ——— means that the respective activities will be implemented during the corresponding term.
 3 The line of - - - - - means that the respective activities will be implemented during the corresponding term if necessary.

**Annex 10 Provisional List of the Equipment Necessary for the
Implementation of the Project**

(1/2)

Item No.	Equipment	Q'ty	Specification	JICA	MIDC
1.	Melting				
1.1.	High Frequency Induction Furnace (1) Transformer (2) Power Source (3) Furnace with Tilting Unit (4) Furnace Selector (5) Hydraulic Unit (6) Refractory and Lining Former (7) Closed Circuit Cooling System (8) Wiring and Piping Material	1	380V/700V 350KVA 500~1,000Hz 300kw 500kg×1, 200kg×1 (1 electric 2 furnaces) Each one set for 500kg×1, 200kg×1 Including emergency engine pump Including Bus bar and Water cooled cable	L	
1.2.	Ladle			L	
1.2.1.	Pouring Ladle with Tilting Gear	3	500kg×1, Bottom dia 500, Depth 550 200kg×2, Bottom dia 380, Depth 400		
1.2.2.	Ductile Treatment Ladle with Tilting gear	2	500kg×1, Bottom dia 500, Depth 550 200kg×1, Bottom dia 380, Depth 400		
1.3.	Ladle Preheater	3			U
1.4.	Optical Pyrometer	1	Portable type	J	
1.5.	Immersion Pyrometer	1			U
1.6.	CE meter	1			U
1.7.	Weighing Device	2	500kg×2, 25kg×1		U
1.8.	Melting Material			J, L	P
2.	Sand Preparation				
2.1.	Sand Returning Equipment				
2.1.1.	Shake-out Machine	1			R
2.1.2.	Oscillating Conveyer	1			R
2.1.3.	Magnet Separator	1			R
2.1.4.	Breaker Screen	1			R
2.2.	Sand Mixing Equipment				
2.2.1.	Sand Mixer	1			R
2.2.2.	Aerator	1	2.2kw Motor	J	
2.2.3.	Collecting Equipment for Spill Sand	1		J	
2.2.4.	Control Panel	1		J	
2.3.	Dust Collector	1	300m ³ /min. 22kw Motor for Blower, Filter Area 200m ² , Sequential pulse jet Cleaning	L	
2.4.	Belt	5	for Belt Conveyer & Bucket Elevator	J	
2.5.	Bucket Elevator(=SKIP)	-			R
2.6.	Sand, Binder Hopper	1			U
2.7.	Weighing Conveyer(=BALANCE)	1	for Binders		U
3.	Moulding				
3.1.	Moulding Machine	1	Double Squeeze (back & pattern side squeezing) Jolt squeeze, Segments squeeze Jolt Capacity 700kg, Squeeze force 36,000kg Squeeze Pressure 4~10ka/cm ² Moulding rate 6min./mould Flask Size 550×650×200/200mm Pin & bush method Outside Size of Pattern Plate 520×620mm Sand feeding batch hopper with level switch	J	
3.2.	Moulding Equipment			J	
3.2.1.	Pusher and Dumper	1	Air and air on oil cushion system		
3.2.2.	Sand Cutter	1	Fixed Cutter Type		
3.2.3.	Mould Turn Over Equipment	1			
3.2.4.	Traverser	1	Pushing cylinder type conveying traverser		
3.2.5.	Mould Closing Equipment	1	Air Lift Type /Air Cylinder for Lift		
3.2.6.	Roller Conveyer	1	Flanged roller, supporting frame and flask-positioning device		
3.2.7.	Test Pattern Liner	1	with Carrier Plate		
3.2.8.	Moulding Flask	6	with Pin & Bushes for Flask		
3.2.9.	Flat cart	6			

Note: (JICA) J: to be procured by JICA in Japan, L: to be procured by JICA Locally
(MIDC) U: Existing and to be used, R: Existing but to be repaired, P: to be procured by MIDC

**Annex 10 Provisional List of the Equipment Necessary for the
Implementation of the Project**

(2/2)

Item No.	Equipment	Q'ty	Specification	JICA	MIDC
3.2.10.	Monorail & Hoist	1			
3.2.11.	Pattern Plate & Liner	1	Pattern plate X 10set, Liner X 1 set		
3.2.12.	Control Panel	1	Central Panel X 1, Site Panel X 4, 240V		
3.2.13.	Metallic Pattern	1			
3.3.	Jolt Squeeze Moulding Machine	2			R
3.4.	Overhead Crane	1	2,000kg, 10m Span Pendant Operation	L	
3.5.	Material for Green Sand Moulding			J, L	P
4.	Organic No-bake Moulding System				
4.1.	Main Body	1	Shake Out Crasher: Capacity 1.5t/h, 1400W X 2000L X 2300H, Rotary Screen: 400Φ X 600mm, Collected Used Sand Bin: 3ton, Sand Reclaimer, Fluidized Sand Separator	J	
4.2.	Core Making System	1	Core Blowing Machine: 1020w X 815L X 1525H Betaset Core Making System, Sand Mixer, Hoist & Chain Block	J	
4.3.	Dust Collector	1	250m ³ /min., Wind pressure 300mmAq, Motor 22kw, Control panel	L	
4.4.	Flask				U
4.5.	Material for Organic Sand Moulding			J, L	P
5.	Finishing				
5.1.	Shot Blasting Machine	1	Table Type Φ1,000mm, 3rpm, 600Kg	J	
5.2.	Dust Collector	1	10m/min 0.75kw Motor Shaking Type	L	
5.3.	Crane Type Shot Blast	1			U
5.4.	Finishing(Fettling) Tools		Hanging Grinder, Hanging Cutter	J	
6.	Inspection				
6.1.	Surface Plate	1	1,600mm X 900mm X 200mm	J	
6.2.	Inspection Tools for Castings			J	
6.3.	Shore Hardness Tester	1		J	
6.4.	Brinell Hardness Tester	1	Hydraulic Type	J	
6.5.	Universal Tensile Machine	1	30t	J	
6.6.	Physical Testing	-			U
6.7.	Chemical Analysis	-			U
6.8.	Sand Testing	-			U
6.9.	Spectrometer	-			U
7.	Pattern Making				
7.1.	Hand Tools for Pattern Making			J	U
7.2.	Machines for Pattern Making				U
7.3.	Material for Pattern Making				U
8.	Others				
8.1.	Forklift	1			
8.2.	Vehicle	2			
8.3.	Generator	1			
8.4.	Office Equipment				
8.4.1.	Facsimile	1			
8.4.2.	Photocopying Machine	1			
8.4.3.	Personal Computer with Software	2			
8.4.4.	Printer	1			
8.4.5.	Copy Board	1			
8.5.	Audio & Visual Equipment				
8.5.1.	Video Camera	1			
8.5.2.	VTR with TV Monitor	1			
8.5.3.	Projector	1			
8.6.	Publications				
8.6.1.	Books			L	P
8.6.2.	Video Tapes			L	P
8.7.	Others				

Note: (JICA) J: to be procured by JICA in Japan, L: to be procured by JICA Locally
(MIDC) U: Existing and to be used, R: Existing but to be repaired, P: to be procured by MIDC

Annex 11

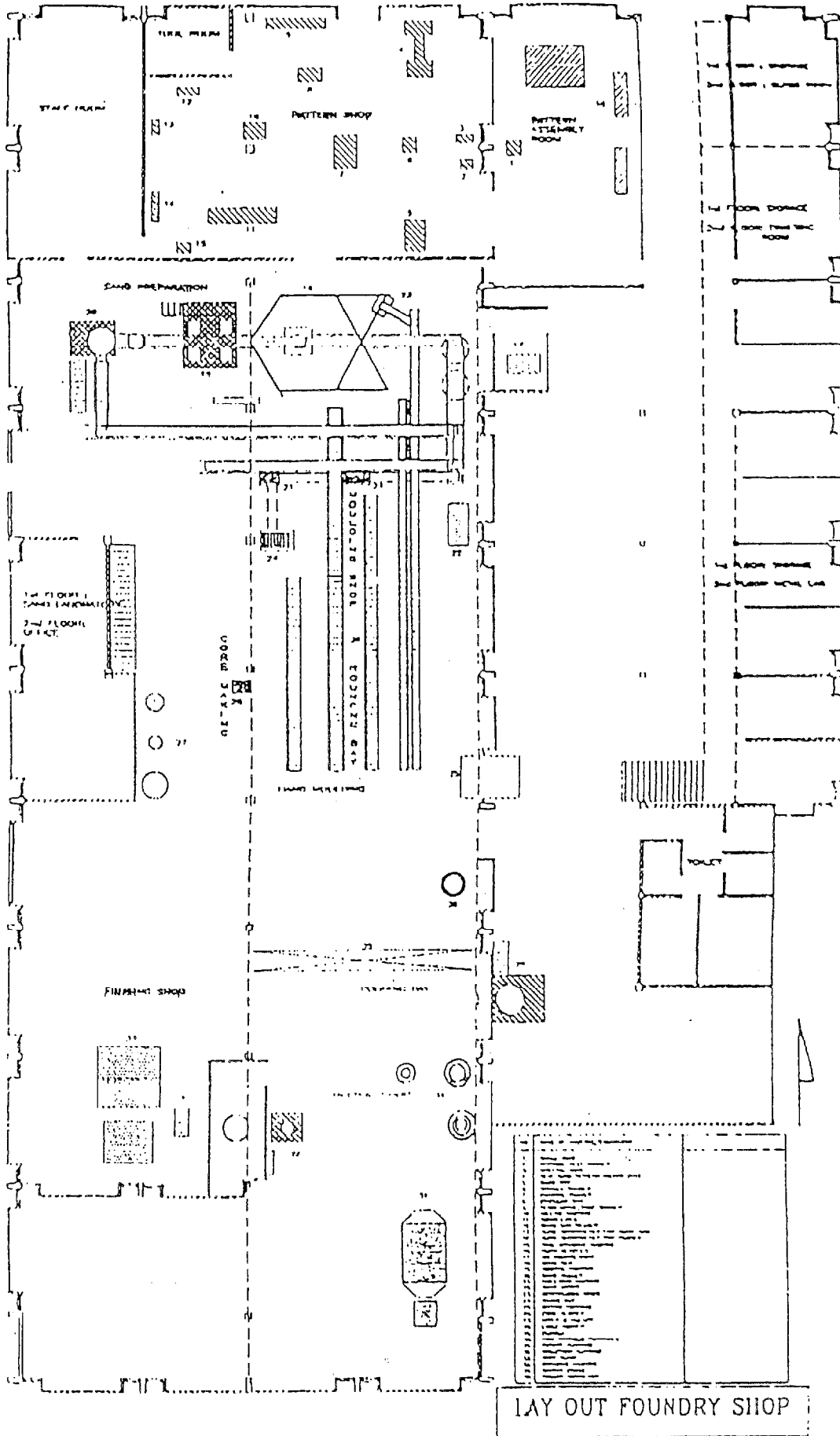
ESTIMATED COST FOR PREPARATION OF EQUIPMENTS
OF JICA - PROJECT

	Installation Cost (Rp)
I. New Equipments Installation	
1. Electric Induction Melting Furnace	75.000.000
2. Sand Conditioning	25.000.000
3. Sand Mixing	25.000.000
4. Moulding Machine	50.000.000
5. Control Panel	10.000.000
6. Crane	5.000.000
7. Core Making	10.000.000
8. Shot Blasting Machine	25.000.000
9. Organic Nobake MM	25.000.000

	250.000.000
II. Relocation Existing Equipment	
1. Rotary Melting Furnace	75.000.000
2. Induction Melting Furnace Cap. 80 kg	50.000.000

	125.000.000
III. Handling Cost of Equipments	200.000.000
IV. Electrical Power Additional Cost	520 KVA (Existing) to be 1020 KVA
	Cost 698.000.000
Total	: Rp 1.273.000.000

Annex 12 Present Layout of the Foundry Shop in MIDC



LIST OF JICA'S COUNTERPART

NR.	N A M A	FIELD	STATUS
I	Adminstrative Staff 1. Ir. Suyono 2. Ir.H. Abdurahim 3. Ir. A. Syaifudin T.M.Eng 4. Dr.Ir. Abdul Wahid, Msc 5. Drs. Hadi Nugroho 6. Ir. Lilis Yuliasetiwati	Management Foundry Engineering Foundry Engineering Foundry Engineering Adminstrative Heat Treatment	Project Manager Coordinator Project Co.Coordinator Project Engineer Adminstrative Officer Engineer
II	Technical 1. George Zainal Hady, BE 2. Ir. Tatang Taryaman 3. Ju a n d a 4. Nuryantoro 5. Boimin 6. Dedi Supriatna 7. A c h m a d 8. R a c h m a t 9. R o s l i n a 10. Sudarman 11. Ruchiat 12. Ir. Rudi Suhradi, M.Sc 13. Ir. Dadang Supriatna 14. Agus Hermawan	Heat Treament QC/Inspection Moulding Moulding Moulding Pattern Pattern Pattern Maker QC/Material QC/Sand Melting Casting Design Melting & QC Pattern Making	Engineer Engineer Technician Technician Technician Technician Technician Technician Technician Technician Technician Engineer Engineer Technician

Annex 14

TENTATIVE ALLOCATION PLAN OF COUNTERPART

PROJECT	COUNTERPART NAME	FIELD	STATUS
I. JICA	1. Ir. Suyono 2. Ir. H. Abdurahim 3. Ir. A. Syaifudin T. M.Eng. 4. DR. Ir. A. Wahid, M.Sc. 5. Drs.Hadi Nugroho 6. Ir. Lilis Yuliasetiawati 7. George Zaenal Hady, BE. 8. Ir. Tatang Taryaman 9. Juanda 10. Nuryantoro 11. Boimin 12. Dedi Supriatna 13. Achmad 14. Rachmat 15. Roslina 16. Sudarnan 17. Ruhiat 18. Ir. Rudi Suhradi, M.Sc 19. Ir. Dadang Supriatna 20. Agus Hermawan	Management Foundry Engineering Foundry Engineering Foundry Engineering Administrative Heat Treatment Engineering Moulding QC / Inspection Moulding Moulding Moulding Pattern Pattern Pattern maker QC / Material QC / Sand Melting Casting Design Melting & QC Pattern Making	Project Manager Coordinator Project Co. Coordinator Project. Engineer Administrative Officer Engineer Engineer Engineer Technician Technician Technician Technician Technician Technician Technician Technician Technician Technician Engineer Engineer Technician
II. ADB	1. DR. Ir. A. Wahid, M.Sc. 2. Ir. Sony Sulaksono, M.Sc. 3. Ir. A. Syaifudin T.M..Eng. 4. Ir. Sopar Napitupulu 5. Ir. Lilis Yuliasetiawati 6. Drs. Syarkawi 7. Ir. Agus Rumanto R. MM. 8. Ir. Mufid Joko R. M.Sc. 9. Ir. Purbaja Adi	Management Administrative Foundry Engineering Welding Heat Treatment Machining Disigner CAD / CAM Expert QC Inspection	Project Incharge Officer Administrative Officer Foundry Field Coordinator Welding Field Coordinator Heat Treatment Field Coordinator Machining Field Coordinator CAD / CAM Field Coordinator Engineer Engineer
III. NIRIN	1. Ir. A. Syaifudin T. M.Eng. 2. DR. Ir. A. Wahid, M.Sc. 3. Ir. Rudi Suhradi, M.Sc. 4. Bambang Sudiono, BA. 5. Drs. Syarkawi 6. Buchori 7. Amas S.	Management Metallurgy Metallurgy Accounting Die Design Die Making Die Making	Coordinator Project Engineer Engineer Administrative Officer. Engineer Engineer Technician

Annex 15 Five Basic Evaluation Components

1 Five Basic Evaluation Components

The five (5) basic evaluation components defined by JICA as mentioned below are in line with those used for the evaluation works by DAC and other international assistance organization. Introduction of these components has enabled a consistent, well-balanced evaluation, which minimizes evaluator bias. Further, it allows us to share the results, knowledge and lessons with other aid organizations, since we are using common components and can discuss with them from the same viewpoints.

(1) Efficiency

Evaluate the method, procedure, term and cost of the project with a view to productivity.

(2) Effectiveness

Evaluate the results in comparison with the goals (or revised ones) defined at the initial or intermediate stage, and evaluate the attributes (factors and conditions) of the results.

(3) Impact

Evaluate the positive and negative effects of the project, extent of the effect and beneficiaries.

(4) Relevance

Preliminary evaluate whether the needs in the country have been correctly identified, and whether the design is consistent with the national and/or master plan.

(5) Sustainability

Evaluate the autonomy and sustainability of the project after the termination of cooperation, from the perspectives of operation, management, economy, finance and technology.

2 Relation between Five Basic Components and PDM

The following five (5) components are used for the evaluation and a selection of a project.

(1) Efficiency

(2) Effectiveness

(3) Impact

(4) Relevance

(5) Sustainability

These components are directly connected to the elements of PDM as shown in the Figure in the following page.

The component "Efficiency" is a measure to qualitatively and quantitatively compare all resource (input) to the results (output)

of the project in order to evaluate the economic efficiency of conversion from input to output.

The parameter "Effectiveness" is a measure to evaluate whether the purpose has been achieved or not, or to evaluate how likely it is to be achieved. In other words, it is to evaluate how much the outputs contributed to the achievement of the purpose, or to evaluate whether or not the characteristics of the outputs were as expected.

The parameter "Impact" is a foreseeable or unforeseeable, and a favorable or adverse effect of the project upon society. To evaluate impact, both the goal and project purpose should be referred to in the beginning of the evaluation. Evaluation with this component could require comprehensive surveys in many cases.

The parameter "Relevance" is to comprehensively evaluate whether or not the project meets the overall goals, politics of both the donor and recipient, local needs and given priority levels, in order to decide whether the project should be continued, reformulated or terminated.

The component "Sustainability" is to comprehensively evaluate how long the favorable effect as a result of the project can continue after the project has been terminated. Evaluation with this component is required to decide how much the local resources should continue to be used for the project, and to evaluate how much the country receiving the assistance has been considering the project important. According to OECD (1989), "Sustainability" is a component to be used for the final test of the success of a development project.

All five components are essential for any of the projects or programs. The five components give necessary information to the decision maker so that he/she can decide how to approach the next step. Since each of the five components build on the elements of the intervention strategy, they also lay foundation for standardization in monitoring and information handling within and among organizations and agencies.

In practice, each of the five parameters should also contain project-specific information.

Five Components vs Goal Hierarchy

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Sustainability:
 Evaluate the extent to which the positive effects as a result of the project will still continue after external assistance has been concluded.

Relevance:
 Evaluate the degree to which the project can still be justified in relation to the national and regional priority levels given to the theme.

Impact:
 Foreseeable or unforeseeable, and favourable or adverse effect of the project upon the target groups and persons possibly affected by the project.

Effectiveness:
 Evaluate the extent to which the purpose has been achieved or not, and whether the project purpose can be expected to happen on the basis of the outputs of the project.

Efficiency:
 Evaluate how the results stand in relation to the efforts and resources, how economically the resources were converted to the outputs, and whether the same results could have been achieved by other better methods.

Inputs	Outputs	Project Purpose	Overall Goal
--------	---------	-----------------	--------------

Goal Hierarchy

FOUNDRY EQUIPMENT

ITHRD-PROJECT
ADB LOAN NO. 1433-INO

NO.	EQUIPMENT	SPECIFICATION AND FEATURE	QTY.	UNIT
1.	Electric Resistance Furnace	Capacity 300 kg Aluminum alloy	1	unit
2.	Annealing Furnace	LxWxH = 1600 x 2000 x 1600 cm. Temp max 1280 °C oil burner	1	unit
3.	Optical Radiant Pyrometer	Temperature range 600 - 3000 °C	2	unit
4.	Immersion Pyrometer	Temperature range 0 - 1768 °C and 500 pcs probe	1	unit
5.	Ladle Heater	Capacity 2 ladles	1	unit
6.	Carbon Equivalent Meter	Computerized, for grey and nodular iron; %CE, %C; %Si; Ti; Ts; grade; % nodularity	1	unit
7.	Cold chamber Die Casting	Space between tie bar HxV = 435x435, die height 550 mm (max) 150 mm (min), stroke 100 mm Ejector force 128 kN, Injection force 175-178 kN plunger die 40-80 mm, shot capacity 75-3 kg max., projected area 129 - 518 mm ²	1	unit
8.	Monorail Overhead Crane	Capacity 1 ton	2	unit
9.	Pneumatic lifting	Capacity 10 ton	8	unit
10.	Hand pneumatic Rammer	Long size	2	unit
		Short size	2	unit
11.	Hand pneumatic Chisel	Capacity 1 bar	2	unit
12.	Holding Scale	Capacity 1000 kg	1	unit
13.	Forklift	Capacity 2.5 ton	1	unit
14.	CNC Milling Machine for Pattern with copying attachment	Spindle center 1050-250 mm, table 1500x700 mm, move in axis W = 250 mm, Z = 800 mm, X = 1600 mm, Y = 800 mm, complete with dust collector.	1	unit
15.	Wood universal milling machine	Spindle colom 200-750 mm, height 470, diameter 1300 mm, swiveling 360 deg, movement 810 x 315 mm, complete with dust collector.	1	unit
16.	Wood lathe machine	Center length 1000/1500 mm, height 500 mm, KW 3.5, 18 spindle DZUS: 55, 160, 410, 870, 70, 210, 430, 1200, 100, 220, 610, 1750, 110, 300, 640, 150, 310, 860, complete with dust collector.	1	unit
17.	Double side disc sanding machine	Diameter 400 mm, table L x W = 500 x 250 mm Accuracy 10 minutes, Protractor degree, included abrasive paper, complete with dust collector.	2	unit
18.	Drill press	Spindle center 500 mm, working height 715 mm and 1215 mm LxW = 490 x 400 mm, 4T slots 12 mm, rotation degree 360 deg.	1	unit
19.	Marking Plate	L x W = 2000 x 1500 mm	2	unit
20.	Right angle mounting	L x W x H = 150 x 75 x 100	3	unit
		L x W x H = 200 x 100 x 150	5	unit
		L x W x H = 275 x 150 x 200	3	unit

Foundry Equipment

1

NO.	EQUIPMENT	SPECIFICATION AND FEATURE	QTY.	UNIT
21.	Pattern Maker vernier	Measuring range 300 mm	6	unit
		600 mm	4	unit
		1000 mm	3	unit
		Shrinkage 1%, 1.25%, 1.5% and 2%		
22.	Vernier depth gage	Measuring range 300 mm with shrinkage 1.1.25, 1.5- 2%		
		150 x 100	3	unit
		200 x 130	3	unit
		250 x 165	3	unit
		300 x 175	3	unit
23.	Back square Angle	Length of leg/mm 75 x 50	3	unit
		100 x 70	3	unit
		150 x 100	3	unit
		200 x 130	3	unit
		250 x 165	3	unit
		300 x 175	3	unit
24.	Band and Circle Saw Sharpener machine	Automatic, 0.5 kW, 2860 rpm. Ø Grinder 150 mm	1	unit
25.	Steel ruler for Pattern making	Measuring length 1000 mm with shrinkage 1%:1.25%: 1.5%: 2%: 2.4%: 3% and standard (normal) ruler	6 each	unit
26.	Sintering Furnace for sand testing	Electrical, 6 kW, Temp. max 1.600 °C	1	unit
27.	Digital technical balance	Cap. 1000 gr	2	unit
		2000 gr	2	unit
28.	Fluidized bed sand for investment casting	Dia. 600 mm, air compressor, Connect size 50A Solenoid valve, AP 21-50 A-B2H-AC 220V Valve 50A, 10kg/cm (KITZ)	1	unit
29.	Work Wood Bench	H = 840 mm, W = 640 mm, L = 2000 mm	5	unit
30.	Pattern Maker Vernier	Shrinkage 2.4% and 3%, 300 mm	6	unit
31.	Vernier depth gage	Shrinkage 2.4% and 3%		
		150 x 100	3	unit
		200 x 130	3	unit
32.	Digital Height gage	Height 1000 mm	1	unit
33.	Height gage for pattern making	Height 500 mm	2	unit
		Height 1000 mm	2	unit
		With shrinkage 1%, 1.25%, 1.5%, 2%		
34.	Digital Vernier Caliper	Length 300 mm	4	unit
		Length 1000 mm	4	unit
35.	Protractor	180 degree	4	unit

Annex 17 Tentative Schedule of Implementation (TSI) (Draft)

Project on Supporting Industries Development for Casting Technology in the Republic of Indonesia

Calendar year	1997				1998				1999				2000				2001				2002				2003				2004
Fiscal Year	1997				1998				1999				2000				2001				2002				2003				
	IV	I	II	III	IV	I	II	III	IV	I	II	III	IV	I	II	III	IV	I	II	III	IV	I	II	III	IV	I			
Term of Technical Cooperation																													
JAPANESE SIDE																													
1. Dispatch of mission																													
1-1 Preliminary study																													
1-2 Supplementary study																													
1-3 Implementation study																													
1-4 Management Consultation																													
1-5 Advisory																													
1-6 Evaluation																													
2. Dispatch of Experts																													
2-1 Long-term experts																													
2-1-1 Chief advisor																													
2-1-2 Coordinator																													
2-1-3 Casting Plan / Melting																													
2-1-4 Pattern Making																													
2-1-5 Moulding																													
2-2 Short-term experts																													
(Short-term experts on specific fields will be dispatched, if necessary)																													
3. Training of C/P in Japan																													
(Certain number of C/P will be accepted annually)																													
4. Provision of machinery and equipment																													
INDONESIAN SIDE																													
1. Building and facilities																													
1-1 Renovation																													
1-2 Maintenance																													
2. Allocation of C/P and administrative personnel																													
3. Provision and maintenance of machinery and equipment																													
4. Budgetary allocation of local cost necessary for implementation of the Project																													

Note:

- This schedule is subject to change in accordance with the progress of the Project.
- The line of ——— means the respective inputs will be implemented during the corresponding term.
- The line of means the respective inputs will be implemented during the corresponding term if necessary.

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Annex 18 Annual Plan of Operations (APO) (Draft)
 Project on Supporting Industries Development for Casting Technology in the Republic of Indonesia

(1/3)

OUTPUT 0. Project operation unit will be enhanced.

Calendar Year Fiscal Year	Target	CY 1999												Responsible person in Project(*)	Input(*)	Remarks	
		FY 1998			FY 1999												
		12	1	2	3	4	5	6	7	8	9	10	11				12
Term of Technical Cooperation		Signing of R/D															
0. Project operation unit will be enhanced.		Necessary number of C/P :20 pers.															
0-1 Allocate necessary personnel.																	
0-1-1 Make personnel allocation plans.															CA,PM	C,LE,CP	
0-1-2 Allocate personnel as planned.															CA,PM	C,LE,CP	
0-2 Make plans of activities.																	
0-2-1 Make and revise plans of activities.															CA,PD,PM	C,LE,CP	
0-2-2 Make plans of activities for the next year.															CA,PD,PM	C,LE,CP	
0-3 Make budget plan and execute properly.																	
0-3-1 Make and revise execution plans of the budget.															CA,PD,PM	C,LE,CP	
0-3-2 Secure necessary budget and make execution plans for the next year.															CA,PD,PM	C,LE,CP	
0-4 Establish and operate management system.																	
0-4-1 Establish management system.															CA,PM	C,LE,CP	
0-4-2 Operate management system.															CA,PM	C,LE,CP	

OUTPUT 1. Machinery and equipment will be installed and maintained properly.

Calendar Year Fiscal Year	Target	CY 1999												Responsible person in Project(*)	Input(*)	Remarks	
		FY 1998			FY 1999												
		12	1	2	3	4	5	6	7	8	9	10	11				12
Term of Technical Cooperation		Signing of R/D															
1. Machinery and equipment will be installed and maintained properly.		Making maintenance record of machinery and equipment															
1-1 Make a facility refurbishment plan and implement as planned.																	
1-1-1 Make a facility refurbishment plan.															CA,PM	CP,C/P	
1-1-2 Implement as planned.															CA,PM	C,LE,CP,C/P	
1-2 Provide and install necessary machinery and equipment.																	
1-2-1 Identify specifications of necessary machinery and equipment.															CA,PM	C,LE,CP,C/P	
1-2-2 Implement tenders and select traders.															CA,PM	C	
1-2-3 Procure and transport the machinery and equipment to the Project site.															CA,PM	C,PC,C/P	
1-2-4 Install the machinery and equipment.															CA,PM	LE,SE,C/P	
1-3 Operate and maintain the machinery and equipment properly.																	
1-3-1 Make operation and maintenance plans of the machinery and equipment.															CA,PM	LE,C/P	
1-3-2 Operate and maintain the machinery and equipment as planned.															CA,PM	LE,C/P	

(*)	<Indonesian Side>	<Japanese Side>
	PD :Project Director	CA :Chief Advisor
	VPD :Vice Project Director	C :Project Coordinator
	PM :Project Manager	LE :Long-term Expert
	CP :Coordinator Project	SE :Short-term Expert
	(to be supported by Co.Coordinator Project)	
	C/P :Indonesian C/P	

Annex 18 Annual Plan of Operations (APO) (Draft)

(2/3)

Project on Supporting Industries Development for Casting Technology in the Republic of Indonesia

OUTPUT 2. Technical capability of the counterpart personnel (hereinafter referred to as "C/P") will be upgraded.

Calendar Year Fiscal Year	Target	CY 1999												Responsible person in Project(*)	Input(*)	Remarks			
		FY 1998			FY 1999														
		12	1	2	3	4	5	6	7	8	9	10	11				12	1	2
	Signing of R/D ▼																		

	2. Technical capability of the counterpart personnel (hereinafter referred to as "C/P") will be upgraded.																		
	2-1 Make technical cooperation program.																		
	2-1-1 Evaluate the technical capability of the C/P.																LE	LE,C/P	
	2-1-2 Specify target castings to measure their technical level.																LE,C	LE,C,C/P	
	2-1-3 Prepare drawings of the target castings.																CA,PM	C,LE,CP	
	2-1-4 Make C/P training plans per technology transfer field.																CA,PM	C,LE,CP	
	2-2 Implement technology transfer to the C/P.																		
	2-2-1 Prepare teaching materials.																LE	LE,C	
	2-2-2 Implement technology transfer as planned.																CA,PM	LE,C/P	
	2-3 Monitor and evaluate the result of technology transfer to the C/P.																		
	2-3-1 Monitor the result of technology transfer to the C/P.																CA,PM	C,LE,CP,C/P	
	2-3-2 Evaluate the result of technology transfer to the C/P.																CA,PM	C,LE,CP,C/P	

OUTPUT 3. Trial prototyping services will be implemented systematically.

Calendar Year Fiscal Year	Target	CY 1999												Responsible person in Project(*)	Input(*)	Remarks			
		FY 1998			FY 1999														
		12	1	2	3	4	5	6	7	8	9	10	11				12	1	2
	Signing of R/D ▼																		

	3. Trial prototyping services will be implemented systematically.																		
	3-1 Make plan of trial prototyping services.																		
	3-1-1 Analyze the result of needs survey on technical service of MIDC.																CA,PM	C,LE,CP,C/P	
	3-1-2 Make implementation plans of trial prototyping services.																CA,PM	C,LE,CP,C/P	
	3-2 Implement the trial prototyping services.																		
	3-2-1 Implement the trial prototyping services as planned.																CA,PM	C,LE,CP,C/P	
	3-3 Monitor and evaluate the trial prototyping services.																		
	3-3-1 Monitor the trial prototyping services.																CA,PM	C,LE,CP,C/P	
	3-3-2 Evaluate the trial prototyping services.																CA,PM	C,LE,CP,C/P	

(*)	<Indonesian Side> PD :Project Director VPD :Deputy Project Director PM :Project Manager CP :Coordinator Project (to be supported by Co. Coordinator Project) C/P :Indonesian C/P	<Japanese Side> CA :Chief Advisor C :Project Coordinator LE :Long-term Expert SE :Short-term Expert
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Annex 18 Annual Plan of Operations (APO) (Draft)

(3/3)

Project on Supporting Industries Development for Casting Technology in the Republic of Indonesia

OUTPUT 4. Technical dissemination services will be implemented systematically.

Calendar Year Fiscal Year	Target	CY 1999												Responsible person in Project (*)	Input (*)	Remarks			
		FY 1998			FY 1999														
		12	1	2	3	4	5	6	7	8	9	10	11				12	1	2
Term of Technical Cooperation		Signing of R/D																	
4. Technical dissemination services will be implemented systematically.																			
4-1 Make plan of technical dissemination services.																			
4-1-1 Analyze the result of needs survey on technical service of MIDC.																	CA,PM	C,LE,CP,C/P	
4-1-2 Make implementation plans of technical dissemination services.																	CA,PM	C,LE,CP,C/P	
4-2 Implement the technical dissemination services.																			
4-2-1 Implement the technical dissemination services as planned.																	CA,PM	C,LE,CP,C/P	
4-3 Monitor and evaluate the technical dissemination services.																			
4-3-1 Monitor the technical dissemination services.																	CA,PM	C,LE,CP,C/P	
4-3-2 Evaluate the technical dissemination services.																	CA,PM	C,LE,CP,C/P	

OUTPUT 5. Information services will be implemented systematically.

Calendar Year Fiscal Year	Target	CY 1999												Responsible person in Project (*)	Input (*)	Remarks			
		FY 1998			FY 1999														
		12	1	2	3	4	5	6	7	8	9	10	11				12	1	2
Term of Technical Cooperation		Signing of R/D																	
5. Information services will be implemented systematically.																			
5-1 Make plan of information services.																			
5-1-1 Make implementation plans of information services.																	CA,PM	C,LE,CP	
5-2 Collect and compile technical information and material.																			
5-2-1 Collect technical information and material.																	C,CP	LE,C/P	
5-2-2 Compile technical information and material.																	C,CP	LE,C/P	
5-3 Provide industries with technical information and material.																			
5-3-1 Hold seminar on casting technology and management.																	CA,PM	C,LE,SE,CP,C/P	
5-3-2 Provide publications on casting technology and management.																	CA,PM	C,LE,CP,C/P	
5-3-3 Open library in MIDC to public on casting technology and management.																	CA,PM	C,LE,CP,C/P	
5-3-4 Provide technical information and material by other means.																	CA,PM	C,LE,CP,C/P	
5-4 Monitor and evaluate compiling of and providing with technical information and material.																			
5-4-1 Monitor and evaluate compiling of technical information and material.																	CA,PM	C,LE,CP,C/P	
5-4-2 Monitor and evaluate providing with technical information and material.																	CA,PM	C,LE,CP,C/P	

(*)	<Indonesian Side>	<Japanese Side>
	PD :Project Director	CA :Chief Advisor
	VPD :Deputy Project Director	C :Project Coordinator
	PM :Project Manager	LE :Long-term Expert
	CP :Coordinator Project	SE :Short-term Expert
	(to be supported by Co. Coordinator Project)	
	C/P :Indonesian C/P	

Annex 19 List of Attendants of the Discussions

The Japanese side

1 Implementation Study Team

Mr. Kazuo Tanigawa	Leader
Mr. Yoshiaki Seki	Technical Cooperation Planning
Mr. Hidehito Yasui	Technical Transfer Planning
Mr. Senri Okada	Casting Technology
Mr. Toru Homma	Project Management

2 JICA Expert

Mr. Toshio Kinoshita	Bureau of Planning, MOIT
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3 JICA Jakarta Office

Ms. Tomoko Takeuchi	Assistant Resident Representative
Mr. Hiroo Tanaka	Assistant Resident Representative

The Indonesia side

1 Ministry of Industry and Trade

Dr. Rosediana Suharto	Head, BPPIP
Drs. Karim Husein	Head, Center for Assessment of Technology for Industry and Trade, BPPIP
Drs. Sudarmadji	Expert

2 Institute for Research and Development of Metal and Machinery Industries (IRDMMI/MIDC)

Ir. J. Suyono	Head, MIDC
Ir. H. Abdurahim	Head, Research Division
Dr. A. Wahid	Head, Process Development Division
Drs. Hadi Nugroho	Head, Administration Division
Ir. Agus Rumanto	Head, Product Development Division
Ir. A. Sjaifudin T.	Head, Foundry Section