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資料１　ミニッツ

MINUTES OF DISCUSSIONS
ON
THE JAPANESE TECHNICAL COOPERATION
FOR
THE PROJECT ON ENGINEERING AND INDUSTRIAL DEVELOPMENT CENTER FOR SMALL AND MEDIUM SCALE INDUSTRIES AT QUERETARO STATE
IN
THE UNITED MEXICAN STATES

The Japanese Supplementary Study Team (hereinafter referred to as "the Team") organized by Japan International Cooperation Agency (hereinafter referred to as "JICA") and headed by Mr. Makoto Yamashita, Deputy Director, First Technical Cooperation Division, Mining & Industrial Development Cooperation Department, JICA, visited the United Mexican States from July 7 to August 8, 1997, for the purpose of working out the details of the Technical Cooperation for the Project on Engineering and Industrial Development Center for Small and Medium Scale Industries at Queretaro State in the United Mexican States (hereinafter referred to as "the Project").

During its stay in Mexico, the Team exchanged views and had a series of discussions with the authorities concerned of the Government of Mexico.

As a result of the discussions, both sides came to reach a common understanding concerning the matters referred to in the document attached hereto.

Mexico City, August 7, 1997

Makoto Yamashita
Leader
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Japan International Cooperation Agency
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Angel Ramirez Vazquez
Director General
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The United Mexican States

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Director Adjunto de Coordinacion del Sistema SEP-CONACYT
Consejo Nacional de Ciencia y Tecnologia
The United Mexican States

ATTACHED DOCUMENT

1 Name of the Project

The Japanese Technical Cooperation for the Project on Engineering and Industrial Development Center for Small and Medium Scale Industries at Queretaro State.

2 Agency concerned of the Project

The Consejo Nacional de Ciencia y Tecnologia (hereinafter referred to as "CONACYT"), as a competent agency of the Centro de Ingenieria y Desarrollo Industrial (hereinafter referred to as "CIDESI"), will be supportive to the budgetary affairs as well as the realization of the countrywide diffusion of the outputs of the Project.

The Project will be implemented by CIDESI.

The present organization chart of CONACYT is as shown in ANNEX 1-1.

The present organization chart of CIDESI is as shown in ANNEX 1-2.

3 Administration of the Project

Deputy General Director for Coordination of SEP-CONACYT System of CONACYT, for General Director of CONACYT, as Deputy General Director in charge of CIDESI at CONACYT, will support the budgetary affairs as well as to realize the countrywide diffusion of the outputs of the Project.

Director General of CIDESI, as the Project Director, will bear overall responsibility for the administration and implementation of the Project.

Director of Material Technology of CIDESI, 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 shown in ANNEX 2.

4 Duration of the Japanese Technical Cooperation for the Project

The duration of the technical cooperation for the Project by the Government of Japan will be four (4) years from the date agreed by both sides in the Record of Discussions (hereinafter referred to as "R/D") to be concluded between JICA and the Mexican side.

5 Site of the Project

The Project will be implemented at CIDESI.

Address :Av. Playa Pie de la Cuesta No.702,
Desarrollo Habitacional, San Pablo
Santiago de Queretaro, Qro. C.P. 76130, MEXICO
Phone :52-42-206426
Fax. :52-42-206365

6 Master Plan of the Project

(1) Objectives of the Project

a Overall Goal

CIDESI and/or other institutes will be able to provide the appropriate technical service in the field of Material Test and Non Destructive Test to the small and medium scale industries in the United Mexican States.

b Project Purpose

CIDESI will be able to provide the appropriate technical service in the said field to the small and medium scale industries in and around Queretaro State.

(2) Outputs of the Project

0 The management system of the Project will be enhanced.
1 The machinery and equipment necessary to implement testing service in the said field will be provided, installed, operated and maintained properly.
2 The technical capability of the counterpart personnel (hereinafter referred to as "the C/P") will be upgraded in the said field.
3 Seminars and training courses in the said field that meet the needs of small and medium scale industries in and around Queretaro State will be established and managed.
4 The technical support towards small and medium scale industries will be systematized.

(3) Activities of the Project

0-1 Allocate staff as planned.
0-2 Formulate plans of activities.
0-3 Make budget plan with appropriate expenditures.
1-1 Implement provision and installation of the necessary machinery and equipment.
1-2 Make plan of operation and maintenance of the machinery and equipment.
1-3 Implement proper operation and regular maintenance of the machinery and

equipment.

2-1 Evaluate the technical capabilities of the C/P through on the job training (hereinafter referred to as "OJT").

2-2 Evaluate the technical capabilities and the needs of the small and medium scale industries in and around Queretaro State through factory visits (semi-extension service).

2-3 Make plan of technology transfer to the C/P.

2-4 Make curricula of technology transfer to the C/P.

2-5 Implement technology transfer to the C/P.

3-1 Evaluate the technical capabilities and the needs of the small and medium scale industries in and around Queretaro State through factory visits (semi-extension service).

3-2 Make curricula of seminars and training courses.

3-3 Prepare and compile materials and textbooks for seminars and training courses.

3-4 Prepare/Implement/Evaluate seminars and training courses.

4-1 Accumulate and pigeonhole information on standards and etc. for the said field.

4-2 Evaluate the technical capabilities and the needs of the small and medium scale industries in and around Queretaro State through factory visits (semi-extension service).

4-3 Provide test service and technical guidance to the said industries at CIDESI and through the extension service.

4-4 Disseminate updated information through seminars, brochures, pamphlet and periodical (Information service).

(4) Project Cycle Management (PCM)

Both sides drew up the draft Project Design Matrix (hereinafter referred to as "PDM") as shown in ANNEX 3.

Furthermore, both sides agreed on the followings:

1 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.

2 PDM should continue to be reviewed as the common reference/communication tool to realize the PCM and discussed further by the time of the visit of the first Consultation Team between the Mexican side and Japanese experts.

7 Fields of Technology Transfer

(1) Fields of Technology Transfer

Both sides confirmed that the technology transfer from the Japanese experts to the C/P will be in the following fields: .

A Common Technical Items

1 Metallurgy

1-1 Basic Metallurgy

1-2 Properties of Various Metals

1-3 Deterioration of Metal

2 Welding and Metal Working

2-1 Welding Metallurgy

2-2 Application of Welding

2-3 Metal Forming

2-4 Heat Treatment

2-5 Surface Treating

3 Quality Control

3-1 Definition of Quality

3-2 Quality Control Procedure

3-3 Quality Assurance System

4 Fundamentals of Test

4-1 Code & Standard

4-2 Statistical Method

4-3 Management of Testing Bodies

4-4 Safety & Health Control in Laboratory

4-5 Environmental Control in Laboratory

B Material Test

a Mechanical Test and Metallography

1 Test Procedure

1-1 Mechanical Test

1-1-1 Tensile Test

1-1-2 Compression Test & Similar Tests

1-1-3 Hardness Test

1-1-4 Impact Test

1-1-5 Fatigue Test

1-1-6 Miscellanies Tests

1-2 Metallography

1-3 Fractography

2 Equipment for Mechanical Test and Metallography

3 Relevant Technology for Mechanical Test and Metallography

3-1 Strength of Metal

3-2 Welding Engineering

G.N.

C. Noguchi

4 Fracture Analysis
b Chemical Analysis
1 Analytical Procedure
1-1 Preparation for Analysis
1-2 Analytical Process
1-2-1 Wet Chemical Analysis
1-2-2 Atomic Absorption Spectroscopic Analysis
1-2-3 Inductive Couple Plasma (ICP) Spectroscopic Analysis
1-2-4 Optical Emission Spectroscopic Analysis
1-2-5 X ray Fluorescence Spectroscopic Analysis
2 Equipment for Chemical Analysis
3 Relevant Technology for Chemical Analysis
C Non Destructive Test
1 Test Procedure
1-1 Visual Examination
1-2 Radiographic Test
1-3 Ultrasonic Test
1-4 Magnetic Particle Test
1-5 Liquid Penetrant Test
1-6 Eddy Current Test
2 Equipment for Non Destructive Test
3 Relevant Technology for Non Destructive Test
3-1 Strength of Metal
3-2 Welding Engineering
4 Evaluation of Defects and Failures in Material and Welding

In this connection, the Team proposed the draft of the Technical Cooperation Program (hereinafter referred to as "TCP") for the Project as shown as in ANNEX 4 and the Mexican side agreed to the content of TCP.

(2) Methodology of Technology Transfer

Both sides reconfirmed that the technology transfer would be normally conducted through the daily entrusted test (testing service) and factory visits (semi-extension service) at the initial stage of the Project, in addition, technical guidance at CIDESI and through extension service, seminars and training courses in due course, in other words, through OJT at any stage of the Project, to be complemented by lectures, at workshop style, provided by the Japanese experts.

8 Measures to be taken by the Japanese side

The Project will be carried out under the framework of Project-Type Technical Cooperation which is the combination of the three (3) followings components:

(1) Dispatch of Japanese Experts

The following Japanese experts will be dispatched:

(Long-term Experts)

1 Chief Advisor
2 Coordinator
3 Expert on Material Test (Mechanical Test &Metallography)
4 Expert on Material Test (Chemical Analysis)
5 Expert on Non Destructive Test

(Short-term Experts)

Both sides agreed that short-term experts would be dispatched on specific fields in relation to the fields of technical transfer as necessity arises.

At this moment, the experts in the following fields are expected to be dispatched:

1 Fracture Mechanics
2 Fracture Analysis
3 Advanced Welding Technology
4 Latest Non Destructive Test
5 Accreditation for Testing Body
6 Corrosion and its Protection for Metals and Alloys
7 Reliability of Non Destructive Test
8 Maintenance of Quality Assurance System (ISO9000)
9 Quality Improvement on site
10 Operation of Scanning Electron Microscope and Fractography
11 Environmental Analysis and Measurement
12 ISO14000

(2) Training of the Mexican Counterpart Personnel in Japan

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

1 Number

A certain number (about 2 persons) yearly

2 Term

About two (2) weeks to three (3) months, depending the fields as well as the C/P dispatched to Japan.

3 Fields

3-1 Project Management

C. Noguera

3-2 Mechanical Test
3-3 Metallography
3-4 Chemical Analysis
3-5 Non Destructive Test
4 Methodology

Training of the C/P in Japan aims mainly at complementing the technology transfer implemented by the expert in CIDESI, the examples of which are described as follows:

1 Training of operating equipment which are not available at CIDESI but are indispensable to enhance the technical capabilities of the C/P for the Project.

2 Training of application of testing in the latest way which is not available either at CIDESI, other institutes or private companies in the United Mexican States but is expected to be necessary in due course.

The Team, further, requested the Mexican side and the latter agreed that, as a matter of course, the C/P may apply to other training courses provided by JICA, 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

Both sides worked out 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 5.

Regarding the said ANNEX, the Equipment are to be classified into four (4) categories, that are earmarked which sides are to provide, based on the request of the Mexican side:

1 The Equipment is now existing at CIDESI, and thus, it will be used for the Project (This category is stood for "U" in the said ANNEX.).

2 The Equipment is now existing at CIDESI, however, due to superannuated one or other reasons, it should be replaced (This category is stood for "R" in the said ANNEX.).

3 The Equipment is now existing at CIDESI, however, another one(s) should be provided for the smooth implementation of the Project (This category is stood for "I" in the said ANNEX.).

4 The Equipment is not existing at CIDESI at present, and thus, it should be provided (This category is stood for "P" in the said ANNEX.).

The Team agreed to convey the request of the Mexican side to the Japanese authorities concerned, stating that the actual provision will be subject to the budget appropriation of the Government of Japan.

The Team explained and the Mexican side agreed that the costs and responsibility necessary for domestic transport, installation and maintenance of the

Equipment should be borne by the Mexican 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.

9 Measures to be taken by the Mexican side

(1) Buildings and Facilities for the Project

The Mexican side will make available the buildings and facilities of CIDESI for the implementation of the Project.

Office space for the Japanese experts equipped properly with office equipment such as phones and desks will be prepared before the commencement of the Project.

In this regard, the Team requested and the Mexican side agreed that the Japanese experts in charge of technical affairs and their respective C/P should be located in the same space to ensure the smooth communication each other.

The Team, further, requested the Mexican side and the latter agreed that the necessary renovation to meet the conditions as listed in ANNEX 6 will be implemented before the delivery of the Equipment by the latter.

The present location map and tentative layout of the Project facilities are as shown in ANNEX 7-1 and ANNEX 7-2.

(2) Machinery, Equipment and Materials

The Mexican 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.

The list of existing machinery and equipment with their present conditions is shown in ANNEX 8.

The Equipment provided by the Mexican side is listed in ANNEX 5.

(3) Assignment of Full-Time Counterpart Personnel

For the successful implementation of the Project, the Mexican side will provide the services of the C/P and administrative personnel as listed in ANNEX 9.

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

Since the Preliminary Study, there existed change of the C/P.

In this connection, the Mexican side explained the present terms of employment at CIDESI.

The Team stated that the stability of the C/P is the most important key for the success of the Project, and in this regard, the Team appreciated the improvement of the terms of employment at CIDESI, however, commented the Mexican side and the

latter agreed that it is comprehensible that the C/P may job-hop, thus, the Project should set up the system to accumulate the results of technology transfer at CIDESI itself as well as in the C/P themselves so that the Project secures its sustainability.

(4) Local Cost

Necessary amount of local cost by the Mexican side will be indispensable for the successful implementation of the Project.

The Mexican side presented a tentative plan for the appropriation of local costs to implement the Project as shown in ANNEX 10, the amount of which increased to compare with that of the Preliminary Study, so the Team appreciated the effort of the Mexican side and requested the latter its continuation.

(5) Privileges, Exemptions and Benefits to the Japanese Experts

In accordance with the provision of Article V and VI of the Agreement on Technical Cooperation between the Government of Japan and the United Mexican States, signed in Tokyo on December 2nd, 1987, the Government of the United Mexican States will grant in the United Mexican States, privileges, exemptions and benefits to the Japanese experts and their families.

(6) Sustainability of the Project

The Mexican side will take necessary measures to ensure that the self-reliant operation of the Project will be sustained during and after the period of the Japanese technical cooperation, through the full and active involvement in the Project by all related authorities, beneficiary groups and institutions so that the technologies and knowledge acquired by the C/P through the Project will ultimately contribute to the economic and social development of the United Mexican States.

10 Joint Coordinating Committee

For the effective and successful implementation of technical cooperation for the Project, a Joint Coordinating Committee will be established whose functions and composition are described in ANNEX 11.

11 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 as and when necessary during and after the cooperation period to better monitor the progress and sustainment of the objectives of the Project.

G. N.

C. Noguera

In this regard, the Team explained the methodology of evaluation, especially five (5) basic evaluation components as shown in ANNEX 12.

1 2 Schedule of the Project

Both sides formulated the Tentative Schedule of Implementation (hereinafter referred to as "TSI") for the Project as shown in ANNEX 13.

Furthermore, both sides drafted the skeleton of Annual Work Plan (hereinafter referred to as "AWP"), taking the said TCP and TSI into consideration, as follows:

1 Standard Weekly Schedule regarding the experts

(1) Entrusted Test two (2) days

(2) Preparation of curricula, teaching materials and textbooks two (2) days

(3) Factory visit one (1) day

2 Factory visits (Semi-extension service)

(1) Term

About seven (7) months from the arrival of the long term experts in the technical affairs

(2) Frequency

Once a week, two (2) factories/time

3 Opening ceremony including Launching seminar

The third (3) quarter of Japanese fiscal year 1998

4 First edition of the pamphlet of the introduction of the Project

By the arrival of the long term experts in the technical affairs, approximately, around May, 1998, if possible

5 First Training the C/P in Japan

The said training will be implemented within the Japanese fiscal year 1997, if possible within calender year 1997. The Project Director will be the first one to be trained.

6 Publicity

The intensive publicity on the Project will be implemented to make best use of the all communication tools within the first (1) year of the technical cooperation.

In this connection, both sides came to the mutual conclusion that the such forms should be prepared and revised properly for the implementation and monitoring the progress of the Project, as listed below, some of which should be completed by the Mexican side before the commencement of the Project and the rest are to be prepared before the beginning of the activities of the Project by the collaboration of the experts and the C/P.

1 List of small and medium scale industries in and around Queretaro to be visited

Note : The List of the said industries should include the stranger to CIDESI to make the Project widely known to the said industries as much as possible at the initial stage of the Project.

2 List of institutes to collaborate with CIDESI to realize the countrywide diffusion of the outputs of the Project
(before the commencement of the Project)

3 Monitor sheet of the technical capability of the said industries
(before the beginning of the activities of the Project)

4 Monitor sheet of the technical capability of the C/P
(before the beginning of the activities of the Project)

The Mexican side agreed to prepare the draft of such forms, which are to be prepared before the commencement of the Project, by the time the Implementation Study Team is dispatched.

Furthermore, both sides affirmed that the results of the technology transfer should be retained in writing, in the same quality and at easy access, as much as possible, so that any personnel concerned for the Project can grasp and monitor the content and progress of the Project.

1 3 Involvement of the Industrial Sector

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

In this connection, the Team recommended the Mexican side and the latter agreed to take necessary measures that the industrial sector will support the followings:

1 Positive acceptance of Factory Visits

2 Positive acceptance of Extension Service

3 Positive dispatch of the engineers and technicians to seminars and training courses as trainees

4 Positive diffusion of the outputs and activities of the Project to the related companies as well as the stranger

5 Other necessary Items

1 4 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 Mexican 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.

The sample of R/D is attached for reference as ANNEX14.

In this connection, both sides further agreed that the items mentioned above 1 ~ 1 3 are still provisional, will be discussed further with other necessary things and finalized when the Implementation Study Team is dispatched.

(3) A list of attendance of the discussions is shown in ANNEX 15.

LIST OF ANNEXES

ANNEX 1-1 Organization Chart of CONACYT
1-2 Organization Chart of CIDESI

ANNEX 2 Organization Chart for the Administration of the Project

ANNEX 3 Tentative Project Design Matrix (PDM)

ANNEX 4 Technical Cooperation Program (TCP) (Draft)

ANNEX 5 List of Machinery and Equipment

ANNEX 6 Necessary Renovation to be conducted by CIDESI

ANNEX 7-1 Present Location Map
7-2 Layout of the Project Facilities

ANNEX 8 List of Existing Machinery and Equipment of CIDESI

ANNEX 9 Tentative Allocation Plan of Counterpart Personnel

ANNEX 10 Tentative Plan for Appropriation of Local Cost

ANNEX 11 Functions and Compositions of Joint Coordinating Committee

ANNEX 12 Five (5) Basic Evaluation Components

ANNEX 13 Tentative Schedule of Implementation (TSI)

ANNEX 14 The Sample of R/D

ANNEX 15 List of Attendance of the Discussion

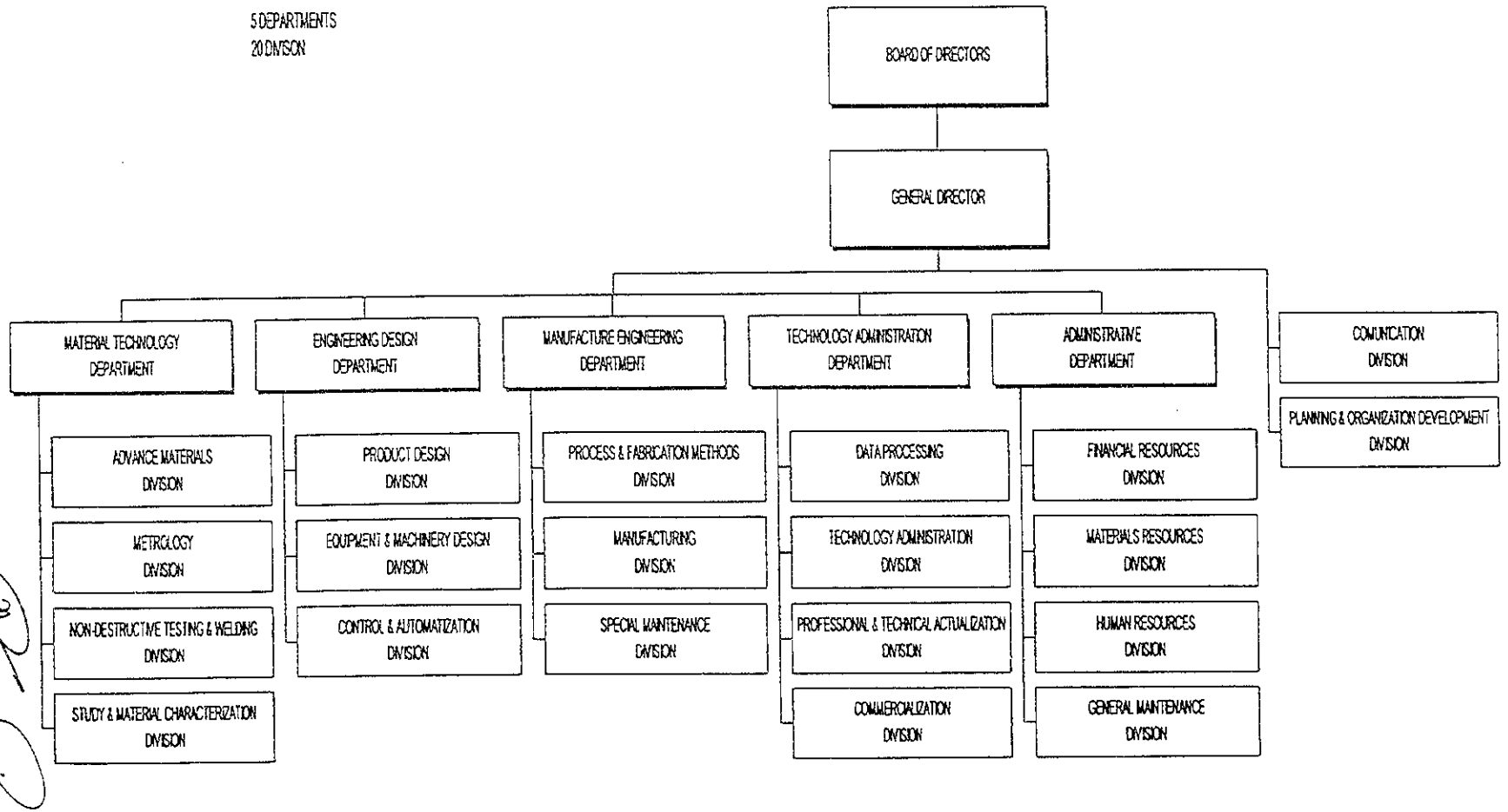
TECNOLOGY & SCIENCE NATIONAL COUNCIL (CONACYT)
GENERAL ORGANIZATION CHART

ANNEX 1-1

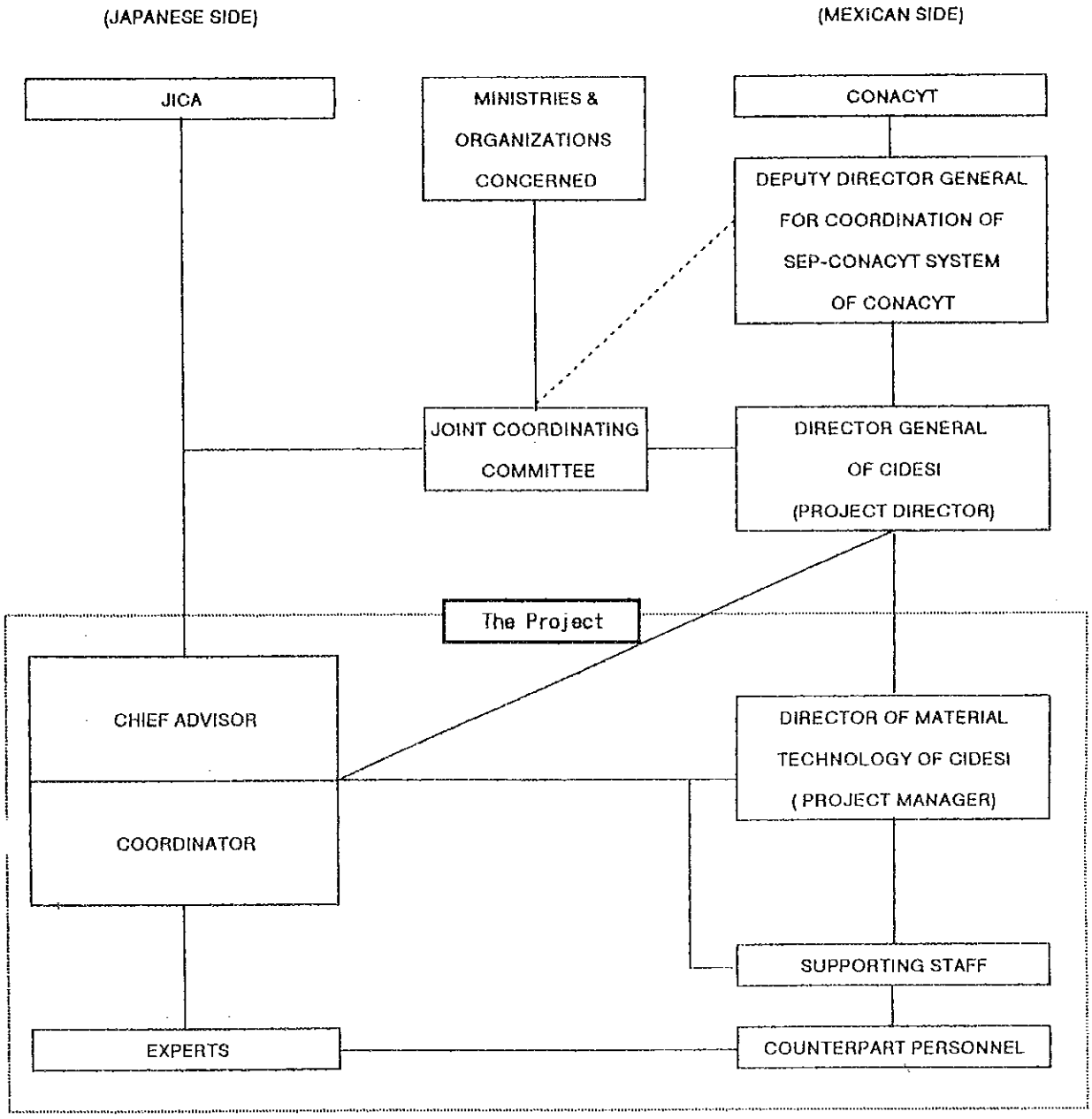
ANNEX 1-2

ORGANIZATION CHART OF
ENGINEERING & INDUSTRIAL DEVELOPMENT CENTER (CIDESI)
SEP-CONACYT

5 DEPARTMENTS
20 DIVISON



ANNEX 2 ORGNIZATION CHART FOR THE ADMINISTRATION OF THE PROJECT



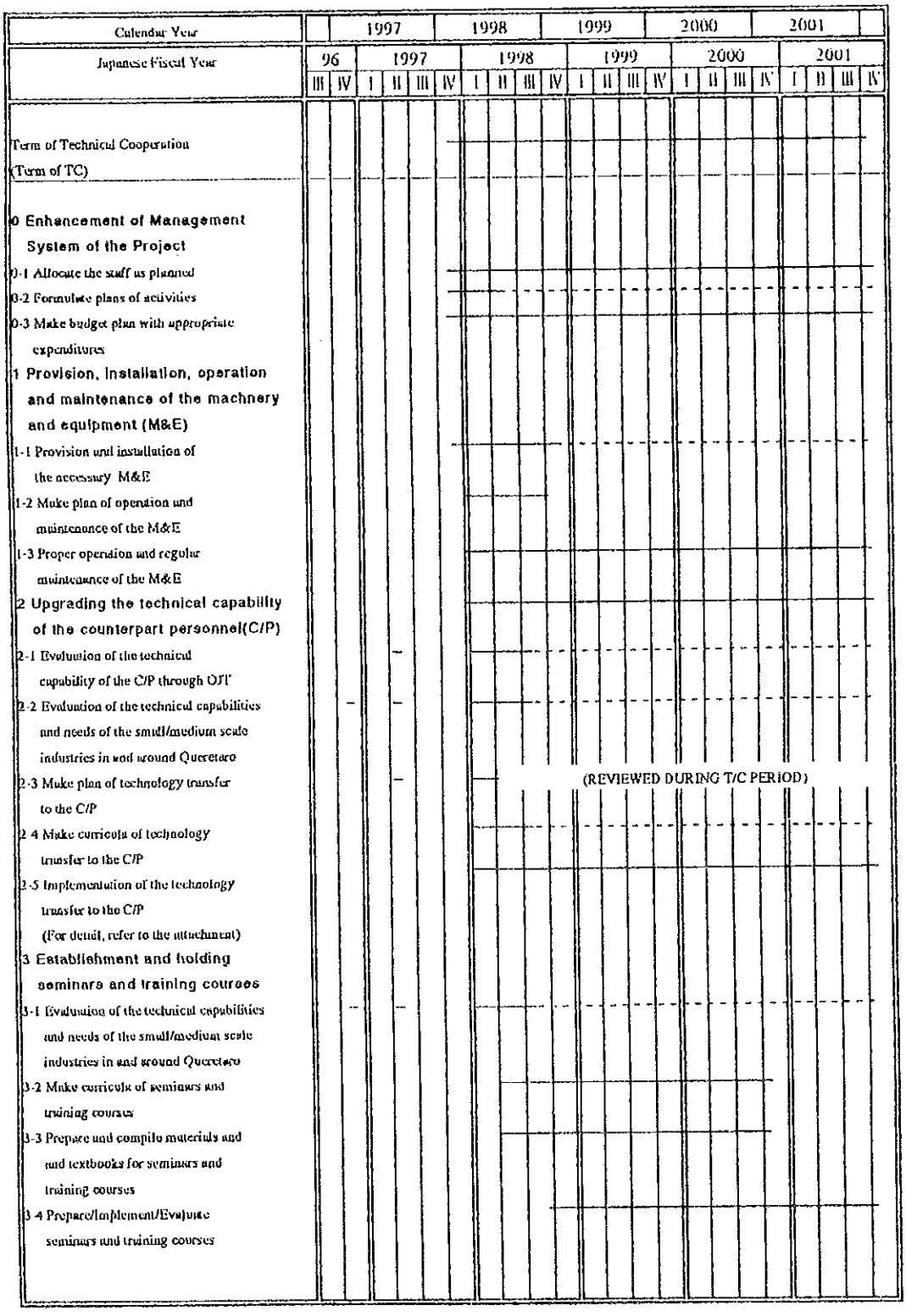
ANNEX 3 TENTATIVE PROJECT DESIGN MATRIX (PDM) (1 / 2)

Narrative Summary	Indicators	Means of Verification	Important Assumptions
(Super Goal) Some of the small and medium scale industries in the United Mexican States will be able to provide the parts to large scale industries in compliance with the requirement of the said industries in the States.	1 Results of parts supply to large scale industries from the small/medium scale industries 2 Sales of small/ medium scale industries.	1 Industrial statistics and specific sector's statistics, questionnaires and interview to industries concerned 2 Industrial statics and specific sector's statics	a The existing national policy on small/medium scale industries promotion will remain unchanged. b The political & economic situation in Mexico will remain stable.
(Overall Goal) CIDESI and/or other institutes will be able to provide the appropriate technical service in the field of Material Test and Non Destructive Test to the small and medium scale industries in the United Mexican States.	1 No. of entrusted tests, extension service, technical guidance, information service at respective institutes. 2 No. of participants in seminars & training courses at respective institutes. 3 No.of qualified personnel at respective institutes as well as in industries concerned. 4 No. of products improved by technical guidance of respective institutes (Production ratio of inferior goods)	1 Annual report of respective institutes, questionnaires and interview to industries concerned 2 Report of seminars& training courses of respective institutes, questionnaires and interview to participants. 3 Personnel record of respective institutes, questionnaires and interview to industries ,concerned 4 Report of technical guidance of respective institutes, questionnaires and interview to industries concerned	a There will be no drastic change in the economic situation in Mexico. b Personnel trained in the Project will remain at their respective organizations. c Old machineries & equipment in the said industries will be replaced or refurbished.
(Project Purpose) CIDESI will be able to provide the appropriate technical service in the said to the small and medium scale industries in and around Queretaro State.	1 No. of qualified personnel in the industries concerned. 2 No. of products improved by technical guidance of CIDESI (Production ratio of inferior goods)	1 Questionnaires and interview to industries concerned 2 Report of technical guidance of CIDESI, questionnaires and interview to industries concerned	a Positive participation to the activities of the Project by the Mexican industrial, governmental, and academic authorities concerned will be assured.
(Outputs) 0 The management system of the Project will be enhanced. 1 The machinery and equipment necessary to implement testing service in the said field will be provided, installed, operated and maintained properly. 2 The technical capability of the counterpart personnel (C/P) will be upgraded in the said field. 3 Seminars & training courses in the said field that meet the needs of small and medium scale industries in around Queretaro State will be established and managed. 4 The technical support towards small and medium scale industries will be systematized	0 No. of staff, budget, capability of managerial staff 1 Operation & maintenance conditions of machinery & equipment. 2-1 No of industries to be visited 2-2 Curricula, manuals & teaching materials 2-3 No. of qualified C/P at CIDESI 3 No. of participants in seminars & training courses at CIDESI. 4-1 Information on standards & etc.available at CIDESI 4-2 No. of entrusted test, extension service, technical guidance, information service at CIDESI 4-3 No. of brochure, pamphlet & periodical issued by the Project	0 Organization chart, Administration record, Accounting record, Personnel record 1-1 Property record, operation & maintenance record of machinery & equipment 1-2 List of manuals prepared for operation & maintenance of machinery & equipment 2-1.Factory visit record (Monitor sheet) 2-2 List of curricula, manuals, & teaching materials 2-3 Personnel record, Certification & Qualification of C/P 3 Report of seminars& training courses of CIDESI, questionnaires and interview to participants. 4-1 List of accession at the library of CIDESI 4-2 Annual report of CIDESI, questionnaires and interview to industries concerned 4-3 Annual report of CIDESI, Project activity report, and list of brochure, pamphlet & periodical	a The C/P who received technical transfer from the Japanese experts will remain at CIDESI. b Industrial sector is cooperative for the activities of the Project such as extension service, information service, seminars and training courses organized by CIDESI.

ANNEX 3 TENTATIVE PROJECT DESIGN MATRIX (PDM) (2 / 2)

(Activities)	Inputs		a The granted equipment will be cleared through customs smoothly.
	Mexican Side	Japanese Side	
0-1 Allocate staff as planned. 0-2 Formulate plans of activities. 0-3 Make budget plan with appropriate expenditures. 1-1 Implement provision and installation of the necessary machinery and equipment. 1-2 Make plan of operation and maintenance of the machinery and equipment. 1-3 Implement proper operation and regular maintenance of the machinery and equipment. 2-1 Evaluate the technical capabilities of the C/P through on the job training (OJT). 2-2 Evaluate the technical capabilities and the needs of the small and medium scale industries in and around Queretaro State through factory visits (semi-extension service). 2-3 Make plan of technology transfer to the C/P. 2-4 Make curricula of technology transfer to the C/P. 2-5 Implement technology transfer to the C/P 3-1 Evaluate the technical capabilities and the needs of the small and medium scale industries in and around Queretaro State through factory visits (semi-extension service). 3-2 Make curricula of seminars and training courses. 3-3 Prepare and compile materials and textbooks for seminars and training courses. 3-4 Prepare/Implement/Evaluate seminars and training courses. 4-1 Accumulate and pigeonhole information on standards & etc. for the said field. 4-2 Evaluate the technical capabilities and the needs of the small and medium scale industries in and around Queretaro State through factory visits (semi-extension service). 4-3 Provide test service and technical guidance to the said industries at CIDESI and through the extension service. 4-4 Disseminate updated information through seminars, brochure, pamphlet & periodical (information service)	1 Local Cost Necessary budget for the implementation of the Project 2 Allocation of C/P and administrative personnel (1) Administrative C/P 2persons (2) Technical C/P 14persons (3) Supporting staff a Technical Staff (a) Technician 2persons (b) Skilled Workers 2persons b Administrative Staff (a) Secretary (b) Driver 3 Provision of Buildings and facilities 4 Provision of Machinery & Equipment and their maintenance	1 Dispatch of Japanese Experts (1) Long term experts a Chief Advisor b Coordinator C Material Test (Mechanical Test & Metallography) d Material Test (Chemical Analysis) e Non Destructive Test (2) Short term experts Appropriate number of short term experts will be dispatched as necessity arises. 2 Mexican C/P Training in Japan A certain number of the C/P per year (from 2 weeks to 3 months) 3 Provision of Machinery and Equipment 4 Supporting Local cost	(Pre-conditions) a CONACYT and SECOFI will be supportive with a definite promise to cooperate extensively for the Project.

ANNEX 4 TECHNICAL COOPERATION PROGRAM (TCP) (DRAFT)



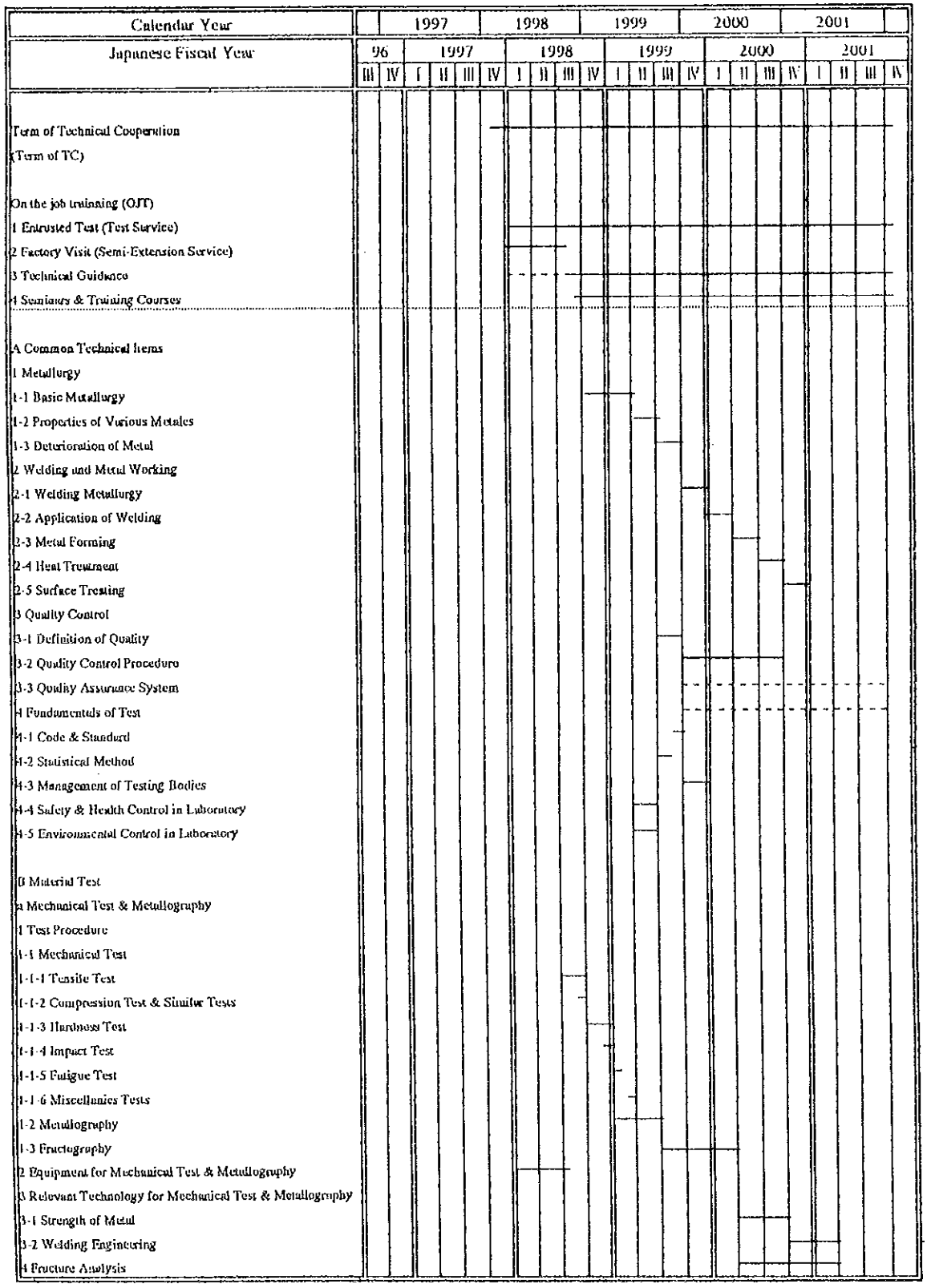
NOTE:
1 The Japanese fiscal year starts in April and ends in March.
2 This schedule is subject to change in accordance with the progress of the Project.

ANNEX 4 TECHNICAL COOPERATION PROGRAM (TCP) (DRAFT)

Calendar Year	1997		1998				1999				2000				2001			
Japanese Fiscal Year	96		1997				1998				1999				2000			
	III	IV	I	II	III	IV	I	II	III	IV	I	II	III	IV	I	II	III	IV
Term of Technical Cooperation (Term of TC)																		
4 Systematization of technical support towards the small/medium scale industries																		
4-1 Accumulate and pigeonhole information on standards & etc																		
4-2 Evaluate the technical capabilities and needs of the small/medium scale industries in and around Queretaro																		
4-3 Provide test service and technical guidance to the said industries at CIDESI and through extension service																		
4-4 Disseminate updated information through seminars, brochure, pamphlet & periodical (Information service)																		

NOTE:
1 The Japanese fiscal year starts in April and ends in March.
2 This schedule is subject to change in accordance with the progress of the Project.

SUPPLEMENTARY ATTACHMENT FOR ANNEX 4

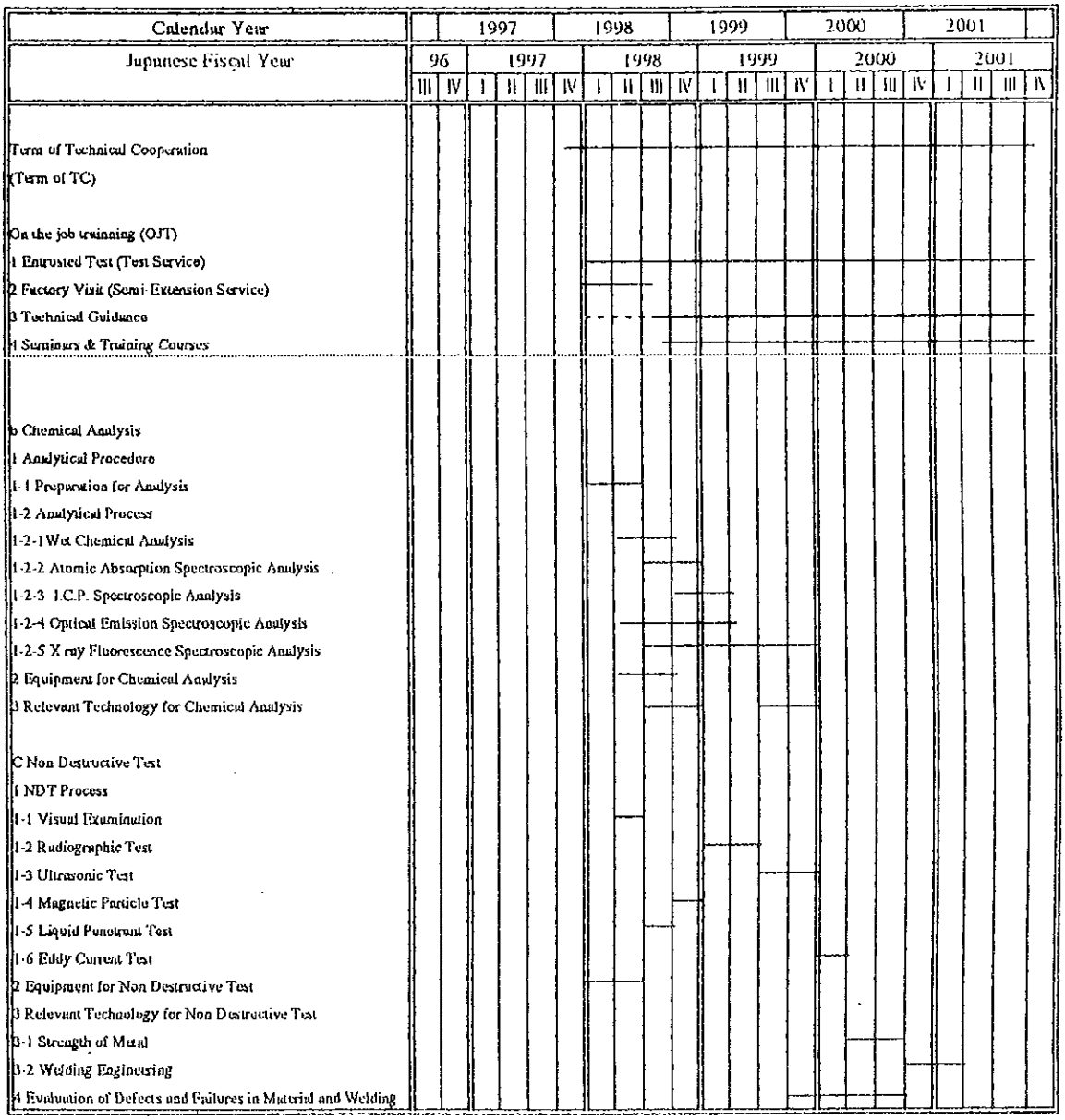


NOTE:

1 The Japanese fiscal year starts in April and ends in March.

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

SUPPLEMENTARY ATTACHMENT FOR ANNEX 4



NOTE:

1 The Japanese fiscal year starts in April and ends in March.

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

ANNEX 5 TENTATIVE LIST OF MACHINERY AND EQUIPMENT

Field	Equipment/Machinery	Priority	Q'ty	Availability (Refer to footnote.)	If to be procured, by Jap or Mex
Mechanical Test	• Universal Testing Machine	1	1	R	Japan
	• Rockwell Hardness Tester	3	1	R	Japan
	• Small Universal Testing Machine	5	1	P	Japan
	• Brinell Hardness Tester	6	1	P	Japan
	• Impact Test Machine	22	1	R	Japan
Metallography	• Scanning Electron Microscope	2	1	P	Japan
	• Microhardness Tester	4	1	R	Japan
	• Electrolyte Polisher and Etcher	15	1	R	Japan
	• Sample Polishing Machine	14	1	R	Japan
	• Sample Mounting Press	16	1	R	Japan
Chemial Analysis	• Fluorescence X-ray spectrometer	8	1	P	Japan
	• Atomic Absorption Spectrometer	9	1	R	Japan
	• Optical Emission Spectrometer (Mobile Type)	10	1	P	Japan
	• Optical Emission Spectrometer (Fixed Type)	11	1	P	Japan
	• Microwave Sample Preparation Apparatus	13	1	P	Japan
	• Air Interchangeable System	21	2	R	Mexico
	• Fume Hood Superstructure	20	1	R	Mexico

NOTE
U:Existing and to be used. R:Existing but to be replaced. I:Existing but to be increased in no. P:To be procured

ANNEX 5 TENTATIVE LIST OF MACHINERY AND EQUIPMENT

Field	Equipment/Machinery	Priority	Q'ty	Availability (Refer to footnote.)	If to be procured, by Jap. or Mex
Non Destructive Test	• Portable X-ray System	7	1	I	Japan
	• Magnetic Particle Testing Apparatus	12	1 set	I	Japan
	- Universal Yoke.		2		
	- Unmovable Yoke.		2		
	- Cross Yoke with 4 Poles and Casters.		1		
	- Standard Test Piece.		10		
	• Weld Defect Samples	18	1 set	P	Japan
	• Ultrasonic Testing Apparatuses	17			Japan
	- Portable Digital Flaw Detector.		2 sets	I	
	- Ultrasonic Thickness Gauge		2	P	
	- Transducer		4 sets	I	
	- Test Block		3	I	
	• Portable Eddy Current Testing Apparatus	19	1	P	Japan
Information & Diffusion	• LAN (Local Area Network)	0	1	P	Mexico
	• Facsimile	0	1	I	Japan
	• Copying Machine	0	1	I	Japan
	• Personnel Computer with software	0	5	I	Mexico
	• Laser Printer	0	2	I	Mexico
	• Modem	0	2	I	Mexico

NOTE
U:Existing and to be used. R:Existing but to be replaced. I:Existing but to be increased in no. P:To be procured

ANNEX 5 TENTATIVE LIST OF MACHINERY AND EQUIPMENT

Field	Equipment/Machinery	Priority	Q'ty	Availability (Refer to footnote)	If to be procured, by Jap. or Mex
Information & Diffusion (Continued)	• Color Scanner	0	1	P	Mexico
	• Video Recorder	0	1	I	Mexico
	• Digital Video Camera	0	1	P	Mexico
	• TV Monitor	0	1	I	Mexico
	• Electronic Board	0	1	P	Japan
	• Standards and literature				
	-ASM Hand Book	0	1 set	P	Japan
	-Welding Hand Book	0	1 set	P	Japan
	-Literature	0	App.	P	Mex./Jap.
	• Standard Samples for Equipmental Analysis	0	App.	P	Mex./Jap.
	• Video Tapes for instruction	0	App.	P	Mex./Jap.
	• CD ROM (Standards and Other Necessary Information)	0	App.	P	Mexico
Vehicles	• Van-type Vehicle (Suburban)	0	1	U	Mexico
	• Mini-bus	0	1	P	Japan (To be confirmed)

NOTE
U:Existing and to be used. R:Existing but to be replaced. I:Existing but to be increased in no. P:To be procured

G.A.

C. Noguera

SUPPLEMENTARY CHART FOR ANNEX 5

The specifications listed below are the provisional ones worked out by both sides

Priority	Specification	Quantity	Location
1	Universal Testing Machine. Maximum capacity 1000 KN. Servohydraulic system. Basic digital control console. with a display. English, metric and international indicating systems. Electronic protection against overload. Guaranteed precision +/- 1 % under load and +/- 0.1 % in range. Hydraulic control panel. 220 V triphase, 60 Hz. Technical handbook. Standard kit of grips for plate test specimens. Kit of "V" grips for round test specimens 1 set of spool grips (6000 lb or more capacity) 1 set of normal and spherical compression plates. 1 weld guided bend tool 1 set of standard specimen holder for threaded and headed specimens. Panel which permits modules control and selection of plotting axis for load, stress and location. Servoautomatic system for the control of load. stress. location and range. Computer controled and data acquisition system. Software to collect information. windows. real graphics with English, metric and international system.	1	Mechanical Testing Laboratory
2	Scanning Electron Microscope. Resolution : 4 nm or smaller Magnification : Maximum 200.000 X or more. EDS system and image analysis software included. EDS with following characteristics : • Acquisition rate : Greater than 50000 CPS • Liquid N2 : Level monitor • Software : Windows 95 • Output screen : Dot map. analog line scan. high speed color maping and cameras. • Data processing : Auto peak designation for qualitative analysis , ZAF and other factor correction for quantitative analysis. Ion spattering device.	1	Metallography Laboratory

Priority	Specification	Quantity	Location
3	**Rockwell Hardness Tester.** Rockwell and surface Rockwell hardness. Controlled by microprocessor and digital indication. Software for statistical analysis which can give : Hardness, number of indentations, highest, lowest an medium values, standard deviation. Load control : Automatic Regular Rockwell scale: A,B,C. Superficial Rockwell scale: N,T. Vertical capacity 240 mm or more. Standard accessory kit Printer.	1	Mechanical Testing Laboratory
4	**Microhardness Tester Vickers & Knoop.** Automatic charge aplication, 10 to 1000 grams of variable charge, camera for video and photography video monitor, microsoft windows software for image processing, digital printer.	1	Metallography Laboratory
5	**Small Universal Testing Machine.** Electromechanical universal testing machine, according to ASTM-E4 and E-83 standards. Frame design : Table top Load capacity : 10 KN Maximum speed : 500 mm/min or more Minimum speed : 0.001 mm/min Maximum force at full speed : 5 KN or more Maximun speed at full load : 500 mm/min or more. Position measurement accuracy : +/-0.10 mm or 0.15 % of displacement +/- one count on display Load measurement accuracy :+/- 0.5 % of reading down 1/50 of cell capacity Strain measurement accuracy : +/-0.5% of reading down to 1/50 of full range. Single phase voltage: 110 or 220 V, 60 Hz 1 set of wedge action grips with accsesories for plane & round specimens. One 3-point bend fixture device 1 set of cord and yarn grips	1	Mechanical Testing Laboratory

Priority	Specification	Quantity	Location
6	**Brinell Hardness Tester.** With dead weights, motorized load application; adjustable time cycle. Test sequence shown in monitor; loads from 62.5 to 3,000 kg with overload lever protection. Standard hardness block; 10 mm diameter. ball; small and standard flat anvils; "V" support block; conversion charts; tools for starting, protection hood, operations handbook.	1	Mechanical Testing Laboratory
7	**Portable X-ray System.** Capacity: 300 Kvp as minimum and 10 mA as maximum. Effective focus size 3.0x3.0 mm or less. Forced air cool type. Generator 30 Kg or less. Controller 20 Kg or less. Power supply with 220 V and 60 Hz applicable. With one (1) positioner to control position of equipment.	1	Non-destructive Testing Laboratory
8	**Fluorescence X-ray Spectrometer** wavelength Dispersive, scanning type Range of analysis : F-U.. Relative precision of analysis : 1 - 5 % Ability of resolution : Count rate 4.2 x 10E9 Other terms of specification X -ray tube : Rh 3KW Detector : SC:10E6, GF-PC :2x10E6 CPS Attenuator of X-ray power : KV mA, control and filter Cooling of tube : Cyclic pure water Electric power source : Spectrometer 220 V (1P), cooling circulator pump 220 V (3P), frequency 50/60 Hz, power spectrometer 220 V and 60 A, data processor 220 V and 10 A or other suppliers specification. Consumption goods : P10 gas Attached goods : Sample holder, mask, regulator for P10 gas Arrangement of sample preparation facility : Sample grinder (belt type) Data control : Software FPD method (Fundamental Parameter Data Process)	1	Chemical Analysis Laboratory

Priority	Specification	Quantity	Location
9	**Atomic Absorption Spectrometer.** Flame/flame less type(Graphite Furnace). Hydride Generator Device. Optical range : 185- 900 nm Hollow cathode lamp : Automatic exchanger Sample sol. Inlet : Simple automatic sampler Gas control : Automatic safe control Data processor : Software data treatment, quality control data storage, communication interface. Electric power source : 200 V 10 A for flame, 200 V 30 A for flameless, 100 V 5 A for data processor. Consumption goods : Graphite tube Attached goods : 10 hollow cathode lamp	1	Chemical Analysis Laboratory
10	**Optical Emission Spectrometer** (mobile type). Range of analysis : 15 channel, 3 reference (Fe,Cu,Al) Optical arrangement : ■ Focus : 750 mm ■ Wavelength : 185 - 530 nm ■ Dispersion : 0.55 nm Detector : Slit/photomultiplier or CCD type Emission gun : Pistol type, 5 m of glass fiber with Ar gas pipe Excitation source : Arc source 3.2 A max. 3 mode selection Controller :Microcomputer. Monitor : Monochromatic Consumption goods : Electrode	1	Chemical Analysis Laboratory

Priority	Specification	Quantity	Location
11	**Optical Emission Spectrometer** (Fixed type) of simultaneous determination Element analysis : 25 channel, 3 reference (Fe,Al,Cu) Optical arrangement : • Focus : 1000 mm • Wavelength 120 - 589 nm, vacuum Excitation source : Max. 500 Hz, 300V/500V, 5 emission mode (C,R,I). Data processor :Microcomputer. Monitor : 14 " color CRT or LCD Software : Autoanalytical mode selection, auto-matrix collection, auto-calibration. Attached goods : Electrode, electrode grinder, Ar gas (bomb)	1	Chemical Analysis Laboratory
12	**Magnetic Particle Testing Apparatus** 2 Universal yokes 2 Unmovable yokes 1 Cross yoke with 4 poles and casters 10 Standards test pieces Specifications : Lifting power comply with international codes Power suply 220 V 60 Hz. Test pieces according to ASTM	1 set	Non-destructive Testing Laboratory
13	**Microwave Sample Preparation Apparatus.** Heating power : 100 V, or 220 V max. 1KW. Digestion Vessel : Maximum 12 with safe valve Control of temperature and pressure : automatic control Ventilation : From vessel and inner chamber Control of digestion : Selection of digestion mode Display : Illumination lamps or LCD screen.	1	Chemical Analysis Laboratory

Priority	Specification	Quantity	Location
14	**Sample Polishing Machine** Semiautomatic operation , designed for heavy duty operation, single sample and rigid pressure, standard wheel speed 150/300 or 50/600 rpm, pressure for single sample up to 22 ½ lb., central pressure up to 101 lbs, single wheel, 10" or 12" diameter	1	Metallographic Laboratory
15	**Electrolyte Polisher and Etcher** Solid state design, with electronic controls, electrolyte temperature and current monitoring, Automatic polish to etch programming.	1	Metallographic Laboratory
16	**Sample Mounting Press.** Electro-hydraulic operation, 25 mm, 30 mm, 40 mm, mount capacity, rapid automatic mounting, duplex mold available, auto cooling, autopreload,	1	Metallographic Laboratory
17	**Ultrasonic Testing Apparatuses** **2 Portable digital flaw detector** with A-Scan B-Scan type B, DAC software for ASME and JIS Code Inspections. Range of operating frequency include 0.5-10 MHz Adjustable wave velocity range include 1000-9999 m/s Adjustable gain control range 0-110 dB, 0.5 dB steps. Gate 2 Ch. 10-90% in vertical Distance amplitude compensation 40 dB dynamic range Memory 30 calibrations Rechargeable batteries with charger **2 Ultrasonic thickness gages**, display actual waveform patterns thru-paint echo-to-echo Applicable up to 400 mm in thickness. Measuring frequency (transducer) 5 MHz or more Measuring mode T-B-B Adjustable wave velocity range include 1000-9999 m/s Memory data 2000 or more. Accuracy 0.025 mm Rechargeable batteries with a charger Transducers 4 Straight-beam transducers. Freq. 2.25 MHz. Size 1 in. 4 Surface weave transducers. Freq. 2.25 MHz. Size 0.5 in. 4 Immersion transducers. Freq. 2.25 MHz. Size 0.5 in. 4 Immersion transducers. Freq. 10 MHz. Size 0.25 in. 4 Angle-beam piezocomposite Freq. 2.25 MHz. Size 0.5 in. 4 Dual element angle-beam Freq. 2.25 MHz. Size 0.75 in. Test blocks 3 IIW Block Type 2. 3 IIW Block Type 1.	1 set	Non-destructive Testing Laboratory

Priority	Specification	Quantity	Location
18	**Weld Defect Samples** **1) Flat plate butt-well sample** SERVICE : UT, angle-beam for training DEFECT CONTAINED : Incomplete penetration, lack of fusion, blow-hole MATERIAL : Carbon steel **2) Flat plate butt-well sample** SERVICE : MT York, for qualification examiners DEFECT CONTAINED : Longitudinal crack, transverse crack MATERIAL : Carbon steel **3) Fillet weld sample :** SERVICE : MT York, for training DEFECT CONTAINED : Longitudinal crack, transverse crack MATERIAL : Carbon steel **4) Fillet weld sample :** SERVICE : PT, solvent removable, for training DEFECT CONTAINED : Crack, blow-hole, undercut MATERIAL : Stainless steel These samples shall duly be certified by an authorized organization. Detailed examination records shall also be attached.	1 set	Non-destructive Testing Laboratory
19	**Portable Eddy Current Testing Apparatus.** Operating Frecuency : Single frecuency mode : 60 Hz - 6 Mhz Dual frecuency mode : 100 Hz - 2 Mhz (multiplexed) 2 Channels Single & Dual Frecuency probes, and 1 chanel Overall gain adjustement 0-90 dB Low Pass and High Pass filters Inputs/Outputs with serial interface for PC communication or serial printer. Rechargeable batteries with charger.	1	Non-destructive Testing Laboratory
20	**Fume Hood Superstructure**, 1.8m wide, 0.76m deep, 2.30m high. Inside body made of 316 type stainless steel. Shippeed, assembled and wired for 110 volts, 60 Hz. External body made of galvanizad carbon steel. Standard accesories: Outlets, illumination system	1	Chemical analysis laboratory
21	**Air Interchangeable System.** Continuous interchange of air in closed areas.	2	Chemical analysis laboratory

G.A.

C. Nogueira

Priority	Specification	Quantity	Location
22	**Impact Test Machine.** Impact pendulum for Charpy tests with a complete kit of accessories, according to ASTM E 23. 2 ranges 406 (aprox.) and 169 (aprox) Joules. Pliers or tongs for low temperature manipulations Cutter for the "V" shaped groove. Adapters for tension-impact test, 120 and 300 foot-pound 10x10 mm inserts for Charpy test specimens. Clamps for Charpy test specimens. Wedge for Charpy test specimens holding.	1	Mechanical Testing Laboratory

ANNEX 6 NECESSARY RENOVATION TO BE CONDUCTED BY CIDESI

Laboratory Room	Equipment	Setting Requirements
Mechanical Test	Universal Testing Machine	• Illuminance • Machine basement to be reformed • Door to be double wide
	Various Type of Hardness Testers	• Illuminance
	Small Universal Testing Machine	• Illuminance • Air conditioning • Clean room • Cooling water: 2 L/min. • Vibration free
	Impact Test Machine	• Machine basement to be build
	Various Types of Fatigue Test Machines	• Illuminance
Metallography	Cutters, Grinding Machines, Polishers, etc.	• Water feed and drain • Illuminance • Partition between sectioning and polishing
	Optical Microscopes, Microhardness Testers	• Clean room
Chemical Analysis (K)	Scanning Electron Microscope	• Air conditioning; 20±5° C • Humidity; 60% max. • Magnetic field; 0.3 μT max. • Vibration free and clean
Chemical Analysis (A)	Atomic Absorption Spectrometer	• Cap. of elect. source; 200V 20 A, 100 V 20 A • Cooling water; 3L/min. • Gas for flame; C2H2, N2O, Compressed air • Exhaust Hood
	Micro W. Sample Preparation Appa.	• Cap. of elec. source; 200V 10A, 100 V 10A • Exhaust digestion gas
Equipment Analysis (B)	X-Ray Fluorescence Spectrometer (800 Kg, 3x3.5m)	• Cap. of ele. source; 200 V 10 A 3P (Pump), 200 V 70A 1P, 100 V 20A • Cooling water; 10L/min. (<30° C) • Room temperature; <±2° C • Room moisture; <75%
	Emission Spectrometer (Fixed Type)	• Cap. of ele. source; 200 V 10 A 3P (Pump),200 V 30A 1P, 100 V 20A • Earth; <30 Ω • Room temperature; <±2° C • Room moisture; <75%
	Emission Spectrometer (Mobile)	• 100 V 20 A/200 V 10 A
	ICP Spectrometer	The same condition as present.
	C/S Comb. Analyser	The same condition as present.

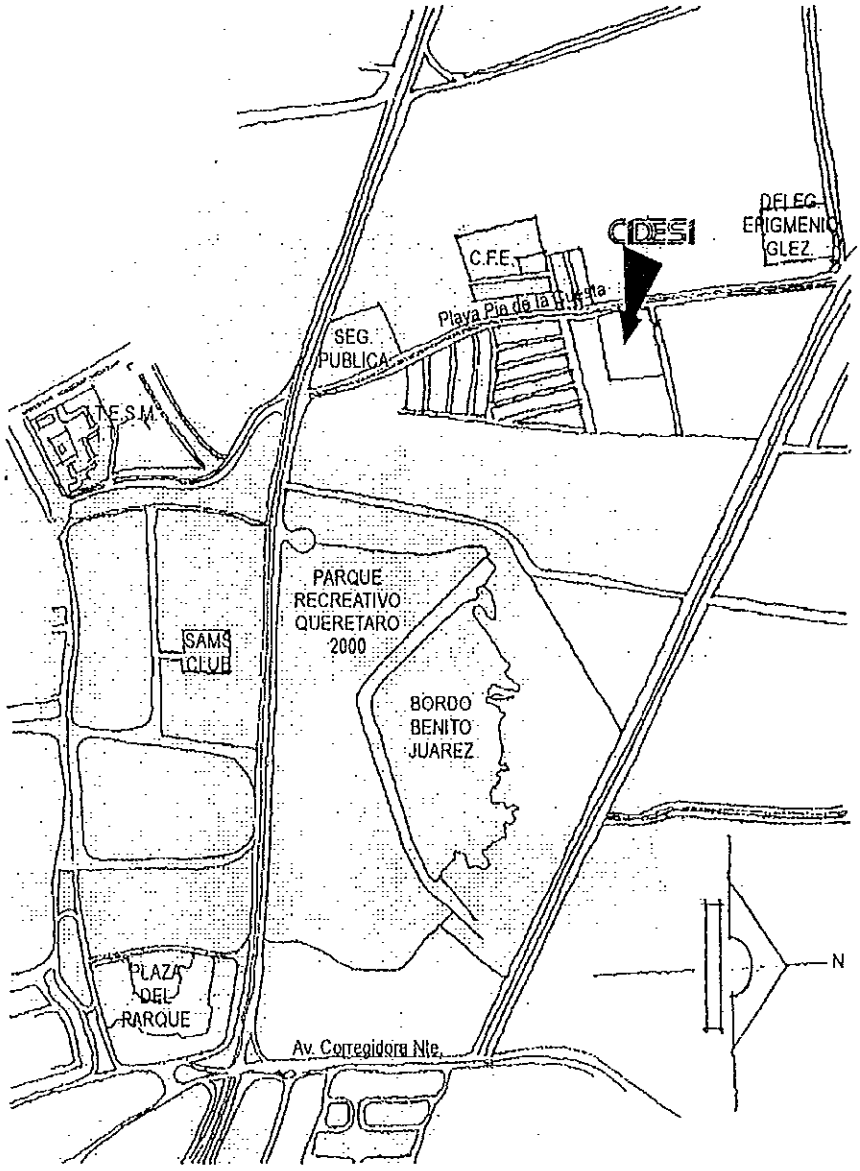
NOTE:

1 The electric power supply is to be enough for new machines.

2 Minimum necessary illuminance shall be provided for the each laboratory.

G. Noguera

ANNEX 7-1 Present Location Map



CIDESI

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CDESI
CENTRO DE DISEÑO Y DESARROLLO INDUSTRIAL
SISTEMA SEP-CONACYT
proyecto:
ENGINEERING
DEVELOPMENT CENTER
INDUSTRIAL
INDUSTRIAL BLUEPRINT
C. Noque

G. L.

ANNEX 7-2. LAY OUT OF THE PROJECT FACILITIES

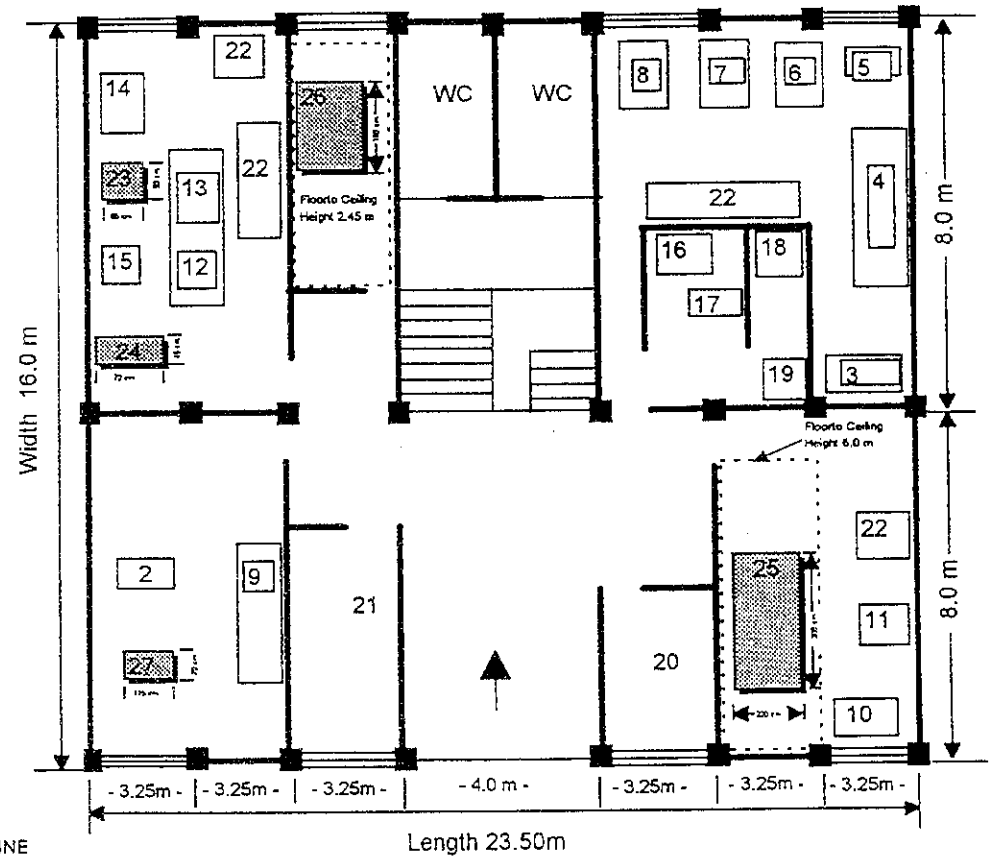
PRESENT EQUIPMENT LOCATION

1.-UNIVERSAL TESTING MACHINE (NEW LOCATION)
2.-IMPACT MACHINE (NEW LOCATION)
3.-TORSION MACHINE
4.-FLEXURAL ROTATIVE MACHINE (UNIVERSAL)
5.-FLEXURAL ROTATIVE MACHINE (210 PUN)
6.-FLEXURAL ALTERNATE MACHINE (PWO-034)
7.-FLEXURAL ROTATIVE MACHINE (211 PN)
8.-FLEXURAL ROTATIVE MACHINE (HIGH TEMP.)
9.-SPECIMEN TEST TRACING MACHINE
10.-LATHE
11.-DRILL MACHINE
12.-PORTABLE BRINELL HARDNESS TESTER
13.- ROCKWELL HARDNESS MACHINE
14.-VICKERS HARDNESS MACHINE
15.- UNUVERSAL HARDNESS MACHINE
16.-ACCESSORY SHELF
17.-ACCESSORY SHELF
18.-ACCESSORY SHELF
19.-ACCESSORY SHELF
20.-OFFICE
21.- OFFICE
22.-ACCESSORY SHELF

REQUIRED EQUIPMENT LOCATION

23.-BRINELL HARDNESS TESTER
24.-DIGITAL HARDNESS TESTER
25.-UNIVERSAL TESTING MACHINE (200 000 Lb)
26.-UNIVERSAL ELECTRO MECHANICAL TESTING MACHINE
27.-IMPACT MACHINE (CHARPY)

MECHANICAL TEST LABORATORY LAYOUT



New Equipment Location

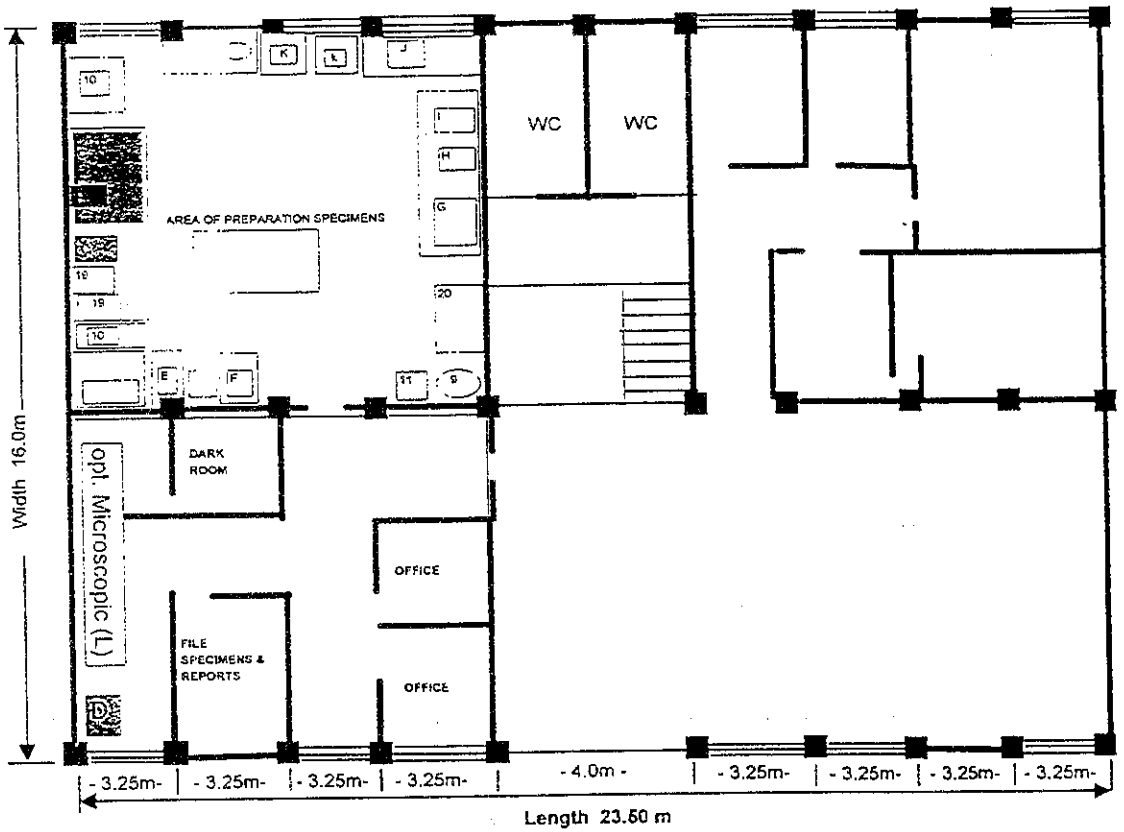
A.- sample preparation System
B.- polisher/etcher Electrolytic
C.- Mounting press
D.- Microhardness test

Actual equipment location

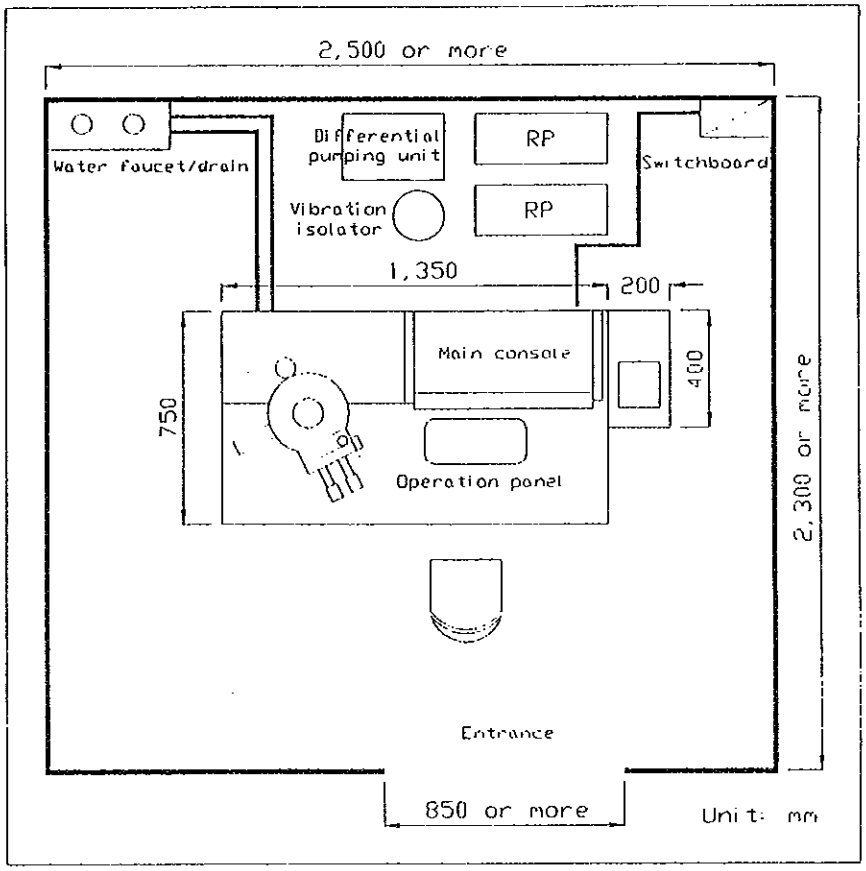
E.- grinding machine
F.- abrasive cut-of machine
G.- Muffle furnace
H.- analytical balance
I .- cleaning ultrasonic
J.- Diamond cut of saw
K.- Metallographic specimens polishing/grinding table
L.- Optical Microscopes

NEW LOCATION
REQUIRED EQUIPMENT LOCATION

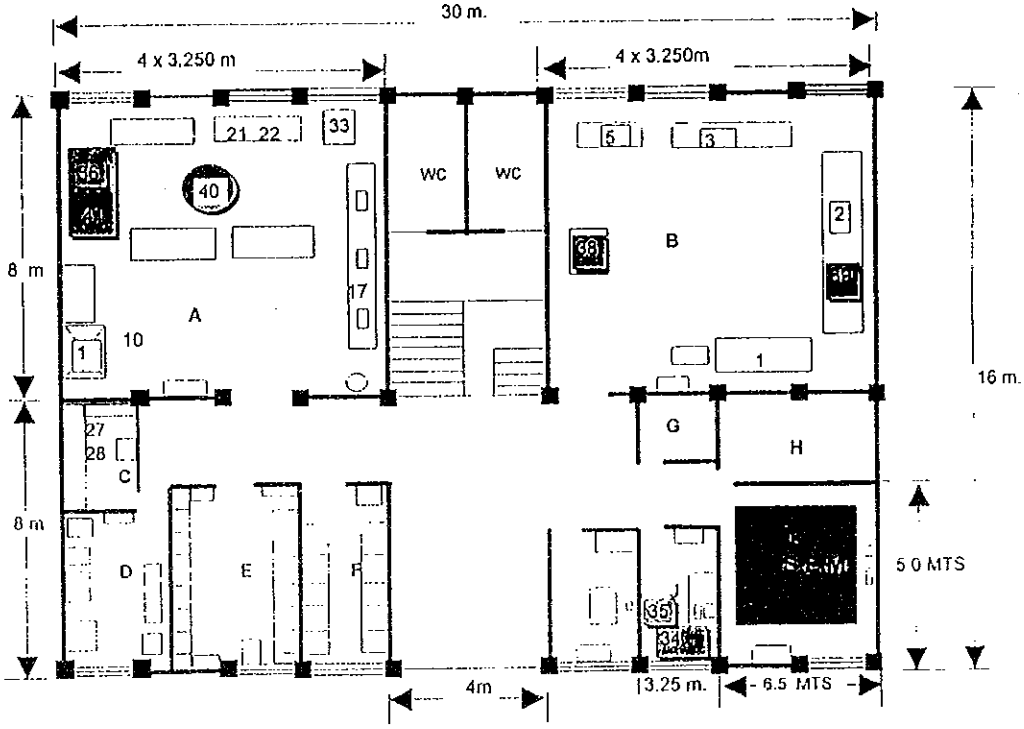
METALOGRAPHY LABORATORY LAYOUT



SEM Installation Layout



CHEMICAL ANALYSIS LABORATORY LAY-OUT
AND
SCANNING ELECTRONIC MICROSCOPE



PRESENT EQUIPMENT LOCATION

REQUIRED EQUIPMENT LOCATION

HEIGHT FROM FLOOR TO CEILING = 2.35 m

A SOLUTION PREPARATION LABORATORY
B INSTRUMENTATION LABORATORY
C BALANCE ROOM
D SAMPLES PREPARATION
E REAGENTS
F MATERIAL STORE
G STANDARDS
H ARCHIVE SAMPLES
I OFFICE
J COMPUTER ROOM
K S.E.M. AREA

T.A. C. Noguera

CHEMICAL ANALYSIS LABORATORY

PRESENT EQUIPMENT

1. PLASMA EMISSION SPECTROMETER
2. ATOMIC ABSORPTION SPECTROMETER
3. ANALYZER FOR DETERMINING C AND S FOR COMBUSTION METHOD
5. ULTRAVIOLET-VISIBLE SPECTROPHOTOMETER
10. FUME HOOD
11. HOT PLATE
13. MUFFLE FURNACE
17. ELECTRICALLY HEATED DISTILLATION APPARATUS
21. PH METER
22. CONDUCTIMETER
23. VACUUM PUMPS
27. ELECTRONIC ANALYTICAL BALANCE
28. ELECTRONIC SUSPENDED PAN ANALYTICAL BALANCE

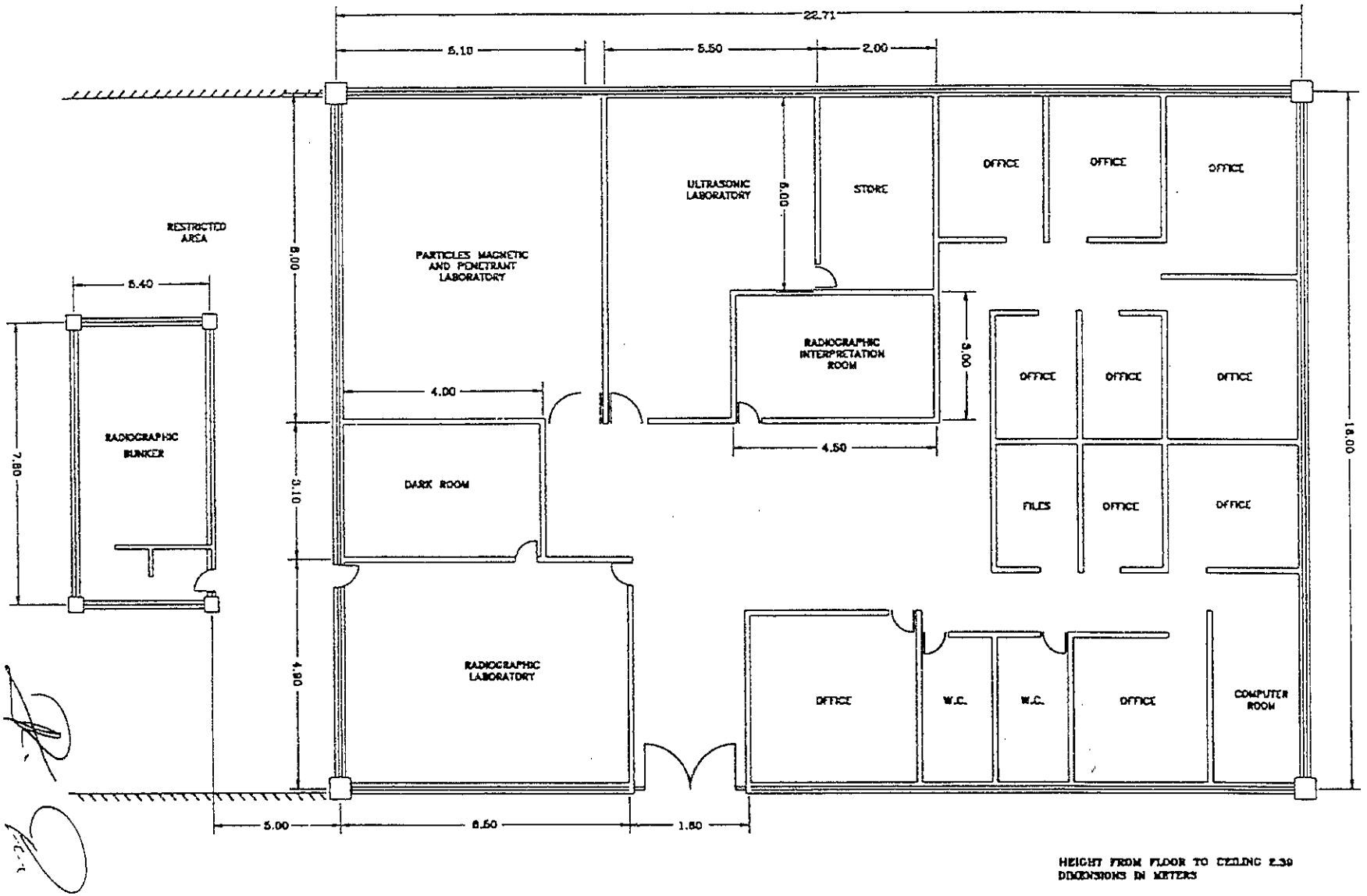
REQUIRED EQUIPMENT

34. FLUORESCENCE SPECTROMETER OF POLARIZER DISPERSIVE ENERGY THROUGH X RAYS
35. OPTICAL EMISSION SPECTROSCOPY MOBILE AND PORTABLE FOR SAMPLES CONTROL
36. MICROWAVE SAMPLES PREPARATION SYSTEM

38. OPTICAL EMISSION SPECTROMETER
39. ATOMIC ABSORPTION SPECTROMETER
40. AIR INTERCHANGEABLIER SYSTEM
41. FUME HOOD.

C. Noguera

WELDING AND NONDESTRUCTIVE TESTING ENGINEERING DIVISION LAYOUT



HEIGHT FROM FLOOR TO CEILING 2.30
DIMENSIONS IN METERS

ANNEX 8 LIST OF EXISTING MACHINERY & EQUIPMENT OF CIDESI

Chemical analysis laboratory

DESCRIPTION	MARK	MODEL	SERIAL NUMBER	CONDITIONS
PLASMA EMISSION SPECTROMETER	SPECTRO	FMD-07	5257/93	OK
ATOMIC ABSORPTION SPECTROMETER	VARIAN	AA-975	5031321	OK
ANALYZER FOR DETERMINING C AND S BY COMBUSTION METHOD	STROHLEIN	CSMAT-6250	9460705	OK
ULTRAVIOLET-VISIBLE SPECTROPHOTOMETER	VARIAN	DMS-80	7021535	OK
ATOMIC ABSORPTION SPECTROMETER EXTRACTOR	-	-	-	OK
PLASMA EMISSION SPECTROMETER EXTRACTOR	-	-	-	OK
FUME HOOD	-	-	-	OK
HOT PLATE	THERMOLINE	HP-A2235M	6111884	OK
MUFFLE FURNACE	THERMOLINE	6030CM	7119405391	OK
ELECTRICALLY HEATED DISTILLATION APPARATUS	INPASA	DE-100	-	OK
PH METERS	CONDUCTRONIC	PH20	-	OK
CONDUCTIMETER	HANNA	HI8033	949603	OK
MOISTURE DETERMINATION BALANCE	OHAUS	6010	27216	OK
AIR COMPRESSOR	EUANS	O60ME100-10	-	OK
TRIPLE BEAM BALANCE	OHAUS	700	28868	OK
EMERENCY SHOWER	-		-	OK
BORER	SOLBERGA	KESO/752-4	1210977	OK
BORER	PRECIS	-	-	OK
REFRIGERATOR	IEM	852C	8104445	OK
ELECTRONIC ANALYTICAL BALANCE	SALZITTER	1801 V 50	3504019	OK
ELECTRONIC SUSPENDED PAN ANALYTICAL BALANCE	BOSCH	S2000	16207	OK
VACUM PUMPS	FELISA	1376	88202	OK

Nondestructive Testing Laboratory. Magnetic Particle Equipment.

DESCRIPTION	TRADEMARK	MODEL	N/S	CONDITIONS
UV INTENSITY METER	TIEDE	J-221	25626	OK
MANETIC FIELD INTENSITY METER	TIEDE	MP-3X	3583	OK
RADIOMETER/PHOTOMETER	SPECTROLINE	DSE-100X	406357	OK
VISIBLE SENSOR	SPECTROLINE	DIX-555A	406251	OK
UV SENSOR	SPECTROLINE	DIX365	406205	OK
ELECTROMAGNETIC YOKE	PERKER RESEAR	DA-200	9917	OK
UV LAMP	SPECTROLINE	SB-100C	498979	OK
STANDARD BLOCK 4.5 Kg.	N/A	N/A	N/A	OK
STANDARD BLOCK 18.1 Kg	N/A	N/A	N/A	OK
CENTRIFUAL TUBE	TIEDE	ASTM D-96	N/A	OK

Nondestructive Testing Laboratory. Dye Penetrate Equipment.

DESCRIPTION	TRADEMARK	MODEL	N/S	CONDITIONS
Ni-Cr STANDARD BLOCK	TESCO	PANEL NI-CR	S/N	OK
Al STANDARD BLOCK	CIDESI	ASME	2024T4	OK

Nondestructive Testing Laboratory. Ultrasonic Equipment.

DESCRIPTION	TRADEMARK	MODEL	N/S	CONDITION
FLAW DETECTOR	KRAUTKRAMER	USL-48	213472	OK
FLAW DETECTOR	PANAMETRICS	EPOCH III-2300	96156409	OK
FLAW DETECTOR	PANAMETRICS	EPOCH III-2300	95049305	OK
STANDARD BLOCK	ATS	IIW TYPE 1	A06666	OK
STANDARD BLOCK	KB-AEROTECH	IIW TYPE 2	793095	OK
STANDARD BLOCK	ATS	DSC	794873	OK
STANDARD BLOCK	ATS	5 STEPS	795880	OK
STANDARD BLOCK	KB-AEROTECH	4 STEPS	794555	OK
STANDARD BLOCK	KB-AEROTECH	DC	791469	OK
STANDARD BLOCK	KB-AEROTECH	RESOLUTION AWS	797156	OK
STANDARD BLOCK	KB-AEROTECH	NAVHPS	794512	OK
STANDARD BLOCK	KB-AEROTECH	CYLINDRICAL AREA/AMPLITUDE	794408	OK
STANDARD BLOCK	ATS	CYLINDRICAL DISTANCE/AMPLITUDE	794407-14	OK
STANDARD BLOCK	ATS	CYLINDRICAL DISTANCE/AMPLITUDE	794781-99	OK
STANDARD BLOCK	ATS	CYLINDRICAL DISTANCE/AREA/AMPLITUDE	795760-69	OK
STANDARD BLOCK	ATS	DS	A06620	OK
STANDARD BLOCK	PANAMETRICS	ASME N-625	A08236	OK
STRAIGHT-BEAM TRANSDUCER	AEROTECH	GAMMA 5 MHz-1"	B14536	OK
STRAIGHT-BEAM TRANSDUCER	AEROTECH	GAMMA 5 MHz-1"	B14577	OK
STRAIGHT-BEAM TRANSDUCER	AEROTECH	GAMMA 5MHz-0.75"	B08530	OK
STRAIGHT-BEAM TRANSDUCER	AEROTECH	GAMMA3.5MHz-1"	F06574	OK
STRAIGHT-BEAM TRANSDUCER	AEROTECH	GAMMA 3.5MHz-1"	F06555	OK
STRAIGHT-BEAM TRANSDUCER	AEROTECH	GAMMA 2.25MHz-0.75"	C05538	OK
STRAIGHT-BEAM TRANSDUCER	AEROTECH	GAMMA 2.25MHz-0.75"	D27470	OK
STRAIGHT-BEAM TRANSDUCER	AEROTECH	GAMMA 2.25MHz-0.75"	H30332	OK
STRAIGHT-BEAM TRANSDUCER	AEROTECH	GAMMA 1MHz-1"	B09446	OK
STRAIGHT-BEAM TRANSDUCER	AEROTECH	GAMMA 1MHz-1"	J26412	OK
STRAIGHT-BEAM TRANSDUCER	AEROTECH	GAMMA 1MHz-0.75"	M07319	OK
STRAIGHT-BEAM TRANSDUCER	AEROTECH	GAMMA 1MHz-0.75"	M07321	OK
STRAIGHT-BEAM TRANSDUCER	AEROTECH	GAMMA 1MHz-0.75"	K11408	OK
STRAIGHT-BEAM TRANSDUCER	NDT	GAMMA 2.25MHz-	124210	OK

		0.25"		
STRAIGHT-BEAM TRANSDUCER	PANAMETRICS	GAMMA 5MHz-0.125"	202736	OK
ANGLE-BEAM TRANSDUCER	KB-AEROTECH	GAMMA 3.5MHz-0.75" X 1"	F12425	OK
ANGLE-BEAM TRANSDUCER	KB-AEROTECH	GAMMA 2.25MHz-5/8" X 5/8"	D27444	OK
ANGLE-BEAM TRANSDUCER	KB-AEROTECH	GAMMA 3.5MHz-0.75" X 1"	F12426	OK
ANGLE-BEAM TRANSDUCER	KB-AEROTECH	GAMMA 2.25MHz-5/8" X 5/8"	K17431	OK
ANGLE-BEAM TRANSDUCER	KB-AEROTECH	GAMMA 2.25MHz-5/8" X 5/8"	K17432	OK
ANGLE-BEAM TRANSDUCER	KB-AEROTECH	GAMMA 1MHz-0.5" X 1"	D16539	OK
ANGLE-BEAM TRANSDUCER	KB-AEROTECH	GAMMA 1MHz-0.5" X 1"	D16540	OK
ANGLE-BEAM TRANSDUCER	KB-AEROTECH	GAMMA 0.5MHz/1"	C26559	OK
ANGLE-BEAM TRANSDUCER	KB-AEROTECH	GAMMA 0.5MHz/1"	C26560	OK
ANGLE-BEAM TRANSDUCER	KB-AEROTECH	GAMMA 2.25MHz/0.5"	40690	OK
ANGLE-BEAM TRANSDUCER	KB-AEROTECH	GAMMA 2.25MHz/0.5"	40733	OK
ANGLE-BEAM TRANSDUCER	KB-AEROTECH	GAMMA 2.25MHz/0.5"	40741	OK
ANGLE-BEAM TRANSDUCER	PANAMETRICS	GAMMA 2.25MHz/0.5"	191005	OK
ANGLE-BEAM TRANSDUCER	KB-AEROTECH	GAMMA 3.5MHz/0.25"	M01912	OK
ANGLE-BEAM TRANSDUCER	KB-AEROTECH	GAMMA 2.25MHz/0.5" MODEL 113/242/591 (MSWUC)	002FTX	OK
DUAL ELEMENT TRANSDUCER	KB-AEROTECH	GAMMA 10MHz/0.25"	M19440	OK
DUAL ELEMENT TRANSDUCER	KB-AEROTECH	GAMMA 10MHz/0.25"	M19443	OK
DUAL ELEMENT TRANSDUCER	KB-AEROTECH	GAMMA 5MHz/0.375"	A16585	OK
DUAL ELEMENT TRANSDUCER	KB-AEROTECH	GAMMA 5MHz/0.375"	A1658/	OK
DUAL ELEMENT TRANSDUCER	KB-AEROTECH	GAMMA 5MHz/0.25"	L29906	OK
DUAL ELEMENT TRANSDUCER	KB-AEROTECH	GAMMA 3.5MHz/0.375"	F21495	OK
DUAL ELEMENT TRANSDUCER	KB-AEROTECH	GAMMA 2.25MHz/0.375"	C15587	OK
DUAL ELEMENT TRANSDUCER	KB-AEROTECH	GAMMA 2.25MHz/0.375"	A19577	OK
DUAL ELEMENT TRANSDUCER	PANAMETRICS	GAMMA 5MHz/0.5" X 1"	198794	OK
DUAL ELEMENT TRANSDUCER	PANAMETRICS	GAMMA 3.5MHz/0.5" X 0.5"	180247	OK

Non-destructive Testing Laboratory. Radiography Equipment.

DESCRIPTION	TRADEMARK	MODEL	N/S	CONDITIONS
X-RAY SYSTEM	ANDREX	2501	34453	OUT OF ORDER
X-RAY SYSTEM	SOURCE ONE	XXQ-2505D	5751	OK
25 ALUMINUM IQI	ASTM	HOLE TYPE ASTM E-142	S/N	OK
25 ALUMINUM IQI	ASTM	HOLE TYPE ASTM E-142	S/N	OK
25 ALUMINUM IQI	ASTM	HOLE TYPE ASTM E-142	S/N	OK
25 ALUMINUM IQI	ASTM	HOLE TYPE ASTM E-142	S/N	OK
25 ALUMINUM IQI	ASTM	HOLE TYPE ASTM E-142	S/N	OK
25 ALUMINUM IQI	ASTM	HOLE TYPE ASTM E-142	S/N	OK
25 ALUMINUM-BRONZE IQI	ASTM	HOLE TYPE ASTM E-142	S/N	OK
25 ALUMINUM-BRONZE IQI	ASTM	HOLE TYPE ASTM E-142	S/N	OK
25 ALUMINUM-BRONZE IQI	ASTM	HOLE TYPE ASTM E-142	S/N	OK
25 ALUMINUM-BRONZE IQI	ASTM	HOLE TYPE ASTM E-142	S/N	OK
25 ALUMINUM-BRONZE IQI	ASTM	HOLE TYPE ASTM E-142	S/N	OK
25 ALUMINUM-BRONZE IQI	ASTM	HOLE TYPE ASTM E-142	S/N	OK
25 PHOSPHORIZED-BRONZE	ASTM	HOLE TYPE ASTM E-142	S/N	OK
25 PHOSPHORIZED-BRONZE	ASTM	HOLE TYPE ASTM E-142	S/N	OK
TRANSMISSION DENSITROMETER	TECH/OPS	301	9119	OK
TRANSMISSION DENSITROMETER	X-RITE	331	2485	OK
RADIOISOTOPE SYSTEM 192-Ir	SPEC	SPEC-2T	921	WITHOUT ISOTOPE
HIGH INTENSITY ILLUMINATOR	S/M	S/N	1	OK
SCALE MAGNIFIER	FOWLER	SCALE MAGNIFIER	52-665-001	OK
DOSIMETER CHARGER	DOSIMETER CORP.	S/N	4645	OK

Metallography Laboratory

DESCRIPTION	TRADEMARK	MODEL	N/S	CONDITIONS
METALLOGRAPHIC MICROSCOPE	LEITZ	METALLOVERT	53825	OK
EXPOSIMETER	WILD	MP545	91414	OK
STANDARD MICROMETER OF 1 mm WITH 100 DIVISIONS FOR MICROSCOPE	S/M	081-864-001	S/N	OK
STANDARD MICROMETER OF 1 CM WITH 100 DIVISIONS FOR MICROSCOPE	S/M	082-200-004	S/N	OK
METALLOGRAPHIC MICROSCOPE	NACHET	TM-75	273735	OK
METALLOGRAPHIC MICROSCOPE	OPL	S/N	272	OK
MICROHARDNESS TESTER	OPL	S/N	42	OK
STEREOSCOPE	NACHET	S/N	306027	OK
PORTABLE METALLOGRAPHIC MICROSCOPE	SWIFT.FM-41	S/N	86502	OK
MUFFLE FURNACE	PROLABO	S/N	72062	OK
AUTOMATIC CUT-OFF MACHINE	BUEHLER	POWERMET-I	398-PAC-168	OK
AIR COMPRESSOR	CBS	S/N	4375	OK
DIAMOND CUT-OFF SAW	BUEHLER	ISOMET	441-IS-14848	OK
ELECTROLYTIC POLISHER	STRUERS	S/N	1421993	OK
SPECIMEN MOUNT PRESS	BUEHLER	S/N	S/N	OK
METALLOGRAPHIC SPECIMENS POLISHING	BUEHLER	S/N	255-T-247	OK
METALLOGRAPHIC SPECIMENS POLISHING	JPS	S/N	737-07-38	OK
EMERY GRINDING	MAPE	S/N	167-188-180	OK
PHOTOGRAPHY CAMERA	CANON	AE-1 PROGRAM	4339751	OK
METALLOGRAPHIC SPECIMENS POLISHER/GRINDER MACHINE	STRUERS	KNUTH ROTOR	1441657	OK
PERMASCOPE (TESTER OF LAYERS NON-MAGNETIC OVER MAGNETIC MATERIALS	TESTWELL FISHER	S/N	121898	OK
PERMASCOPE (TESTER OF LAYERS NON MAGNETIC OVER MAGNETIC MATERIALS	TESTWELL FISHER	S/N	322151	OK
ANALYTICAL BALANCE	METTLER	S/N	363974	OK
AMPLIFIER PHOTOGRAPHIC FOR COLOR	OPEMUS	S/N	606209	OK
AMPLIFIER PHOTOGRAPHIC FOR B& W	LEITZ	S/N	S/N	OK

Mechanical Test Laboratory

DESCRIPTION	MARK	MODEL	NUMBER	CONDITIONS
UNIVERSAL HARDNESS MACHINE	FRONKOSKOP	1968	660	NO
VICKERS HARDNESS MACHINE	LIMITED	VICKERS	HTM6771	OK
ROCKWELL HARDNESS MACHINE	MITUTOYO	RCD150	89001	OK
PORTABLE BRINELL HARDNESS TESTER (3000 Kg)	BRINELLA	BRINELLA	1644	OK
IMPACT MACHINE (CHARPY)		PSN30Kgm	2621	OK
UNIVERSAL TESTING MACHINE	AMSLER	SZBD	699/469	OK
FLEXURAL ROTATE MACHINE (HIGH TEMPERATURE)	ADAMEL	ADAMEL No. 17		OK
FLEXURAL ROTATE MACHINE (211 PN)	SCHENK	PUN-NS	PUN-0211	OK
FLEXURAL ROTATE MACHINE (210 PUN)	SCHENK	PUN-NS	PU-0210	OK
FLEXURAL ALTERNATE MACHINE (PWO-034)	SCHENK	PWD-NS	PWO-0314	OK

UNIVERSAL FLEXURAL ROTATE MACHINE (PUNZO 212)	SCHENK	PUN-Z	PUN-0212	OK
TORSION MACHINE	SCHENK	PWY-NS	PWY	OK
DRILL MACHINE	PRECIS	S/N		OK
LATHE	ATLASS	10100		OK
SPECIMEN TEST TRACING MACHINE	MOHR		6340	OK

ANNEX 9 TENTATIVE ALLOCATION PLAN OF COUNTERPART PERSONNEL

1 Counterpart

(1) Administrative Counterpart

a Project Director

Director General, CIDESI

b Project Manager

Director of Material Technology, CIDESI

(2) Technical Counterpart

a Material Test

Santiago Soriano Reyes	*	Chief of Material Characterization Division
Maria de la Luz Dorantes Romo		Engineer (Chemical Analysis)
Estela Gonzalez Caballero		Engineer (Chemical Analysis)
Rosalba Hernandez Rivera		Engineer (Chemical Analysis)
Carlos Ramirez Baltazar		Engineer (Metallography)
Juan Velazquez Aguirre		Engineer (Mechanical Test & Metallography)
Concepcion Obregon Zepeda	**	Engineer (Mechanical Test)

b Non Destructive Test

oJoel Chaparro Gonzalez		Chief of NDT Division
Mauricio Tello Rico		Engineer
Jose Nunez Alcocer		Engineer
Alvaro Campos Guillen		Engineer
Jaime Gonzalez Silva		Engineer
Cesar Alejandro Sanchez Perez		Engineer
(Resignation)	*	Engineer

2 Supporting Staff

(1) Technical Staff

a Technician

Rolando Rosales Nava	Material Test (Metallography)
Gerardo Castillo Perez	Material Test (Mechanical Test)

b Skilled Workers

Cuauhtemoc Baru Vazquez Ortiz		NDT Test
Angel Estefan Arellano E.	*	NDT Test

(2) Administrative Staff

a Secretary

b Driver

NOTE:

1 The above-underlined personnel will be regarded as Direct Technical Counterpart.
For further information, please refer to the supplementary chart on next page.

2 The personnel earmarked with "*" is changed from the Preliminary Study.

3 The personnel earmarked with "**" is increased from the Preliminary Study.

SUPPLEMENTARY CHART FOR ANNEX 9

	Material Test			Non Destructive Test		
	Preliminary Study	Present	Project	Preliminary Study	Present	Project
Chief	(1) 1	(1) 1	(1) 1	(1) 1	(1) 1	(1) 1
Engineer	(3) 5	(3) 6	(3) 6	(3) 6	(3) 5	(3) 6
Technician	(0) 2	(0) 2	(0) 2	(0) 0	(0) 0	(0) 0
Skilled Workers	(0) 0	(0) 0	(0) 0	(0) 2	(0) 2	(0) 2

Note

1 The numbers in round brackets show the number of the C/P who are directly transferred technology by the Japanese experts.

The technology transfer to the rest will be conducted by the said C/P.

In this connection, both sides agreeed that the C/P counted in round brakets would be regarded as the Direct Technical Counterpart to Japanese experts.

2 Necessary numbers of technician in the field of Non Destructive Test and/or skilled workers in the field of Material Test will be allocated upon request by the Jananese experts.

4-1.

C. Noguer

ANNEX 10 TENTATIVE PLAN FOR APPROPRIATION OF LOCAL COST

(UNIT: M$)

	1997	1998	1999	2000	2001	TOTAL
STAFF EXPENSES	(1,568,356)	(1,568,356)	(1,568,356)	(1,568,356)	(1,568,356)	(7,841,780)
	1,819,091	1,819,091	1,819,091	1,819,091	1,819,091	9,095,455
BUILDING AND FACILITIES	(12,000)	(37,000)				(49,000)
	12,000	81,880				93,880
MACHINERY, EQUIPMENT AND MATERIALS PROCURED BY CIDESI	(122,113)	(164,190)	(167,683)	(136,960)	(177,885)	(768,831)
		487,920	436,320	436,320	436,320	1,796,880
MAINTENANCE AND OPERATION OF MACHINERY & EQUIPMENT	(80,604)	(102,586)	(305,317)	(305,317)	(305,317)	(1,099,141)
		293,696	299,568	305,440	311,320	1,210,024
UTILITIES,COMMUNICATIONS AND OTHERS		(20,000)	(24,000)	(28,800)	(43,200)	(116,000)
	8,800	20,000	20,000	20,000	20,000	88,800
DOMENSTIC TRANSPORTATION, HANDLING AND INSTALLATION OF MACHINERY & EQUIPMENT		(120,000)	(48,000)	(42,000)	(48,000)	(258,000)
		246,760	48,000	42,000	48,000	384,760
TOTAL (B)	(1,783,073)	(2,012,132)	(2,113,356)	(2,081,433)	(2,142,758)	(10,132,752)
(A)	1,839,891	2,949,347	2,622,979	2,622,851	2,634,731	12,669,799
RATIO (%) (A/B)	103.19%	146.58%	124.11%	126.01%	122.96%	125.04%

NOTE :

1 Mexican fiscal year starts in January and ends in December.

2 The each figure in round brackets is the one presented on the occasion of the Preliminary Study.

As for the said fiugure, the figure for staff expenses and maintenance & operation of machinery & equipment took the inflation into consideration, while the figure of this survey neglects it.

As a result, the said figure are also amended not to include the inflation.

ANNEX 11 FUNCTIONS AND MEMBERS OF JOINT COORDINATING COMMITTEE

1 Functions

The joint coordinating committee will be held at least once a year and whenever necessity arises.

Its functions are as follows:

(1) To settle on the Annual Work Plan (AWP) of the Project in line with the Tentative Schedule of Implementation (TSI) and Technical Cooperation Program (TCP) formulated under the framework of the Record of Discussions,

(2) To coordinate necessary actions to be taken by both sides,

(3) To review the overall progress of the TCP as well as the achievement of the AWP,

(4) To exchange views on major issues arising from or in connection with the TCP.

2 Composition

(1) Chairperson

Director General of CIDESI

(2) Committee Members

(Mexican Side)

a Representative(s), SRE

b Representative(s), CONACYT

c Representative(s), SECOFI

d Other personnel concerned with the Project decided by the Mexican side, if necessary

(Japanese Side)

a Chief Advisor

b Coordinator

c Japanese Experts designated by the Chief Advisor

d Representative(s) of the JICA Office in the United Mexican States

e Other personnel concerned to be decided and dispatched by JICA, if necessary

Note :

Official(s) of the Embassy of Japan in the United Mexican States may attend the Committee as observer(s).

G. A.

C. Noguera

ANNEX 12 FIVE BASIC EVALUATION COMPONENTS

1 Five Basic Evaluation Components

The five basic 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 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 o conversion from Input to output.

The parameter "Effectiveness" us a measure to evaluate whether the purpose has been achieved or not, or 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.

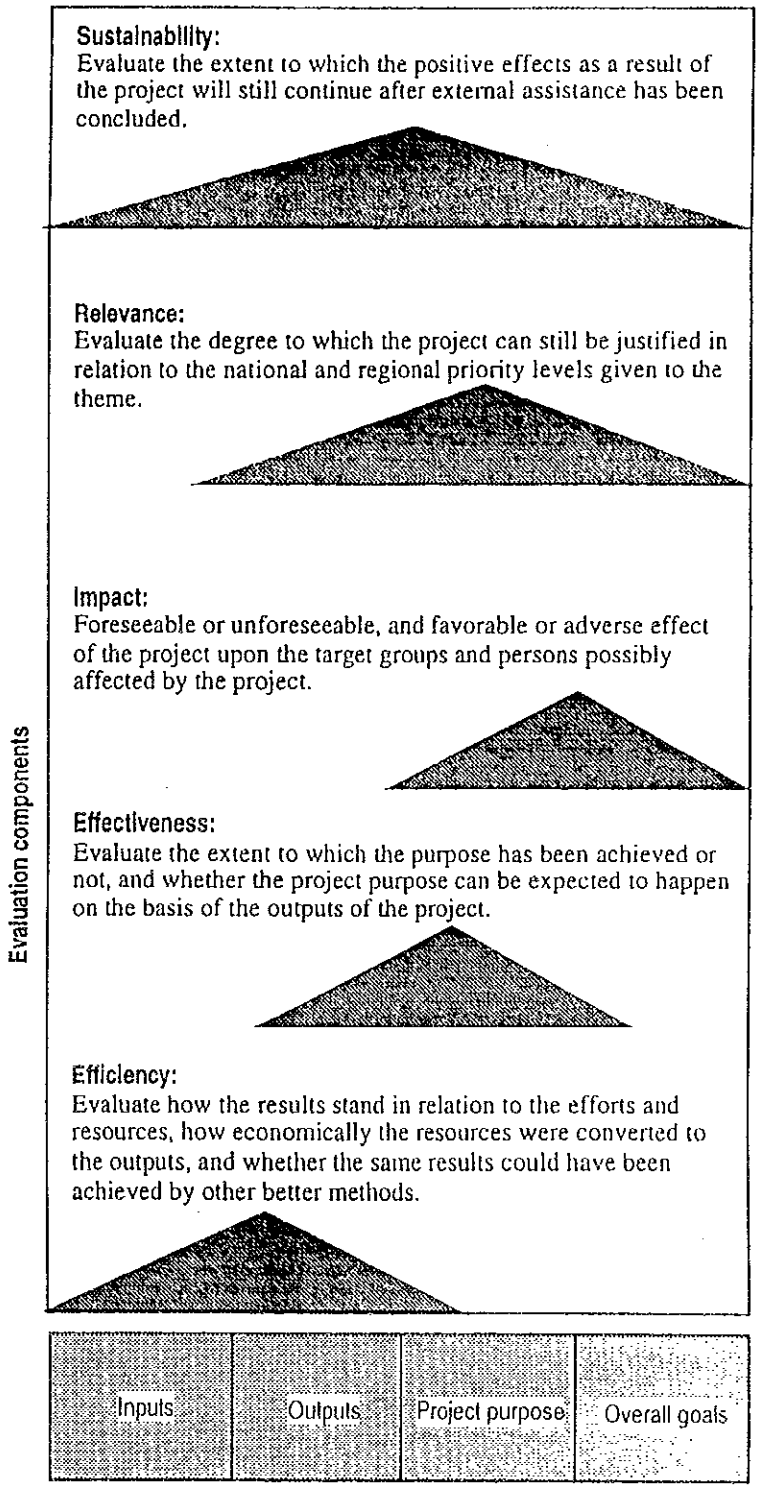
The parameter "Impact" is a foreseeable or unforeseeable, and a favorable or adverse effect of the project upon society. The evaluate impact, both the goal and project purpose should be referred to in the beginning of the evaluation. Evaluation with this components could lead to more than the confirmation as whether or not the goals have been obtained. Evaluation with this component requires 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 important. According to OECD (1989), "Sustainability" is a component to be used for the final test of the success of a development project.

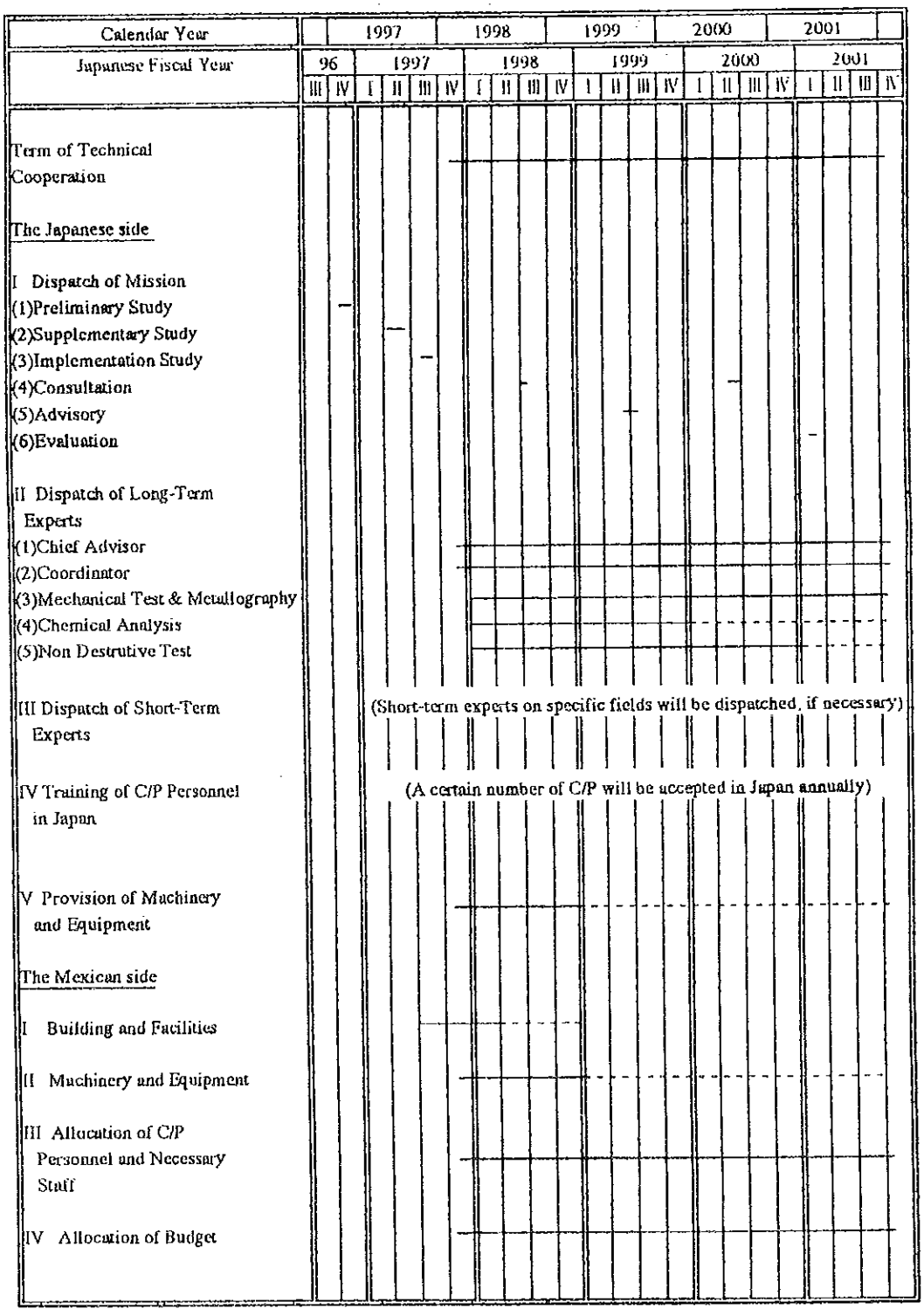
All five components are essential for any of the projects or programs. The five components give necessary information to the decision maker so that he/she can decide how to approach the next step. Since each of the five components build on the intervention strategy, they also lay the foundation for standardization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

ANNEX 13 TENTATIVE SCHEDULE OF IMPLEMENTATION (TSI)



NOTE:

1 The Japanese fiscal year starts in April and ends in March.

2 The original terms of the services of the respective long term experts are shown by the solid line.

G.A. C. Noguera

ANNEX 14 THE SAMPLE OF R/D

RECORD OF DISCUSSIONS
BETWEEN JAPANESE IMPLEMENTATION SURVEY TEAM
AND AUTHORITIES CONCERNED OF
THE GOVERNMENT OF THE UNITED MEXICAN STATES
ON JAPANESE TECHNICAL COOPERATION
FOR THE PROJECT ON ENGINEERING AND INDUSTRIAL DEVELOPMENT CENTER
FOR SMALL AND MEDIUM SCALE INDUSTRIES AT QUERETARO STATE

The Japanese Implementation Survey Team (hereinafter referred to as "the Team") organized by Japan International Cooperation Agency (hereinafter referred to as "JICA") and headed by Mr. , visited the United Mexican States from to , for the purpose of working out the details of the technical cooperation program concerning the Project on Engineering and Industrial Development Center for Small and Medium Scale Industries at Queretaro State (hereinafter referred to as "the Project") in the United Mexican States.

During its stay in the United Mexican States, the Team exchanged views and had a series of discussions with the Mexican authorities concerned with respect to desirable measures to be taken by both Governments for the successful implementation of the Project.

As a result of the discussions, and in accordance with the provisions of the Agreement on Technical Cooperation between the Government of Japan and the Government of the United Mexican States, signed in Tokyo on December 2nd,1986 (hereinafter referred to as "the Agreement"), the Team and the Mexican authorities concerned agreed to recommend to their respective Governments the matters referred to in the document attached hereto.

Done in duplicate in the Spanish and English language, each text being equally authentic. In case of any divergence of interpretation, the English text shall prevail.

Place, Date of signing

Leader
Implementation Survey Team
Japan International Cooperation Agency

ATTACHED DOCUMENT

I. COOPERATION BETWEEN BOTH GOVERNMENTS

1.The Government of the United Mexican States will implement the Project in cooperation with the Government of Japan.
2.The Project will be Implemented in accordance with the Master Plan which is given in Annex I.

II. MEASURES TO BE TAKEN BY THE GOVERNMENT OF JAPAN

In accordance with the laws and regulations in force in Japan, and the provision of Article III of the Agreement, the Government of Japan will take, at its own expense, the following measures through JICA according to the normal procedures under the Technical Cooperation Scheme of Japan.

1.DISPATCH OF JAPANESE EXPERTS
The Government of Japan will provide the services of the Japanese experts as listed in ANNEX II. The provision of Article IX of the Agreement will be applied to the above-mentioned experts.

2.PROVISION OF MACHINERY AND EQUIPMENT
The Government of Japan will provide such machinery, equipment and other materials (hereinafter referred to as "the Equipment") necessary for the implementation of the Project as listed in Annex III. The provision of Article VIII-1 of the Agreement will be applied to the Equipment.

3.TRAINING OF MEXICAN PERSONNEL IN JAPAN
The Government of Japan will receive Mexican personnel connected with the Project for technical training in Japan.

III. MEASURES TO BE TAKEN BY THE GOVERNMENT OF THE UNITED MEXICAN STATES

1.The Government of the United Mexican States will take necessary measures to ensure self-reliant operation of the Project during and after the period of Japanese technical cooperation, through full and active involvement in the Project of all related authorities, beneficiary groups and institutions.

2.In accordance with the provision of Article IV of the Agreement, the Government of the United Mexican States will ensure that the technologies and knowledge acquired by the Mexican nationals as a result of Japanese technical cooperation

will contribute to the economic and social development of the United Mexican States.

3.In accordance with the provisions of Articles V and VI of the Agreement, the Government of the United Mexican States will grant, in the United Mexican States, privileges, exemptions and benefits no less favorable than those granted to experts of third countries or international organizations performing similar missions to the Japanese experts referred to in II-1 above and their families.

4.In accordance with the provision of Article VIII of the Agreement, the Government of the United Mexican States will take the necessary measures to receive and use the Equipment provided through JICA under II-2 above and the equipment, mahinery and materials carried in by the Japanese experts referred to in II-1 above.

5.The Government of the United Mexican States will take necessary measures to ensure that the knowledge and experience acquired by the Mexican personnel from technical training in Japan will be utilized effectively in the implementation of the Project.

6.In accordance with the provisions of Articles V-(b) of the Agreement, the Government of the United Mexican States will provide the services of the Mexican counterpart personnel and the administrative personnel as listed in ANNEX IV.

7.In accordance with the provisions of Articles V-(a) of the Agreement, the Government of the United Mexican States will provide the land, buildings and facilities as listed in Annex V.

8.In accordance with the laws and regulations in force in the United Mexican States, the Government of the United Mexican States will take necessary measures to supply or replace, at its own expense, the machinery, equipment, instruments, vehicles, tools, spare parts and any other necessary materials for the implementation of the Project other than the Equipment provided through JICA under II-2 above.

9.In accordance with the laws and regulations in force in the United Mexican States, the Government of the United Mexican States will take necessary measures to meet the running expenses necessary for the implementation of the Project.

C. Noguer

9.1.

IV. ADMINISTRATION OF THE PROJECT

1. (title) , (organization) , as the Project Director, will bear overall responsibility for the administration and implementation of the Project.

2. (title) , (organization) , as the Project Manager, will be responsible for the managerial and technical matters of the Project.

3.The Japanese Chief Adviser will provide necessary recommendations and advice to the Project Director and the Project Manager on any matters pertaining to the implementation of the Project.

4.The Japanese experts will provide necessary technical guidance and advice to the Mexican counterpart personnel on technical matters pertaining to the implementation of the Project.

5.For the effective and successful implementation of technical cooperation for the Project, a Joint Coordinating Committee will be established whose functions and composition are described in Annex VI.

6.The organization chart for the implementation of the Project is shown in Annex VII.

V. JOINT EVALUATION

Evaluation of the Project will be conducted jointly by the two Governments through JICA and the Mexican authorities concerned, at the middle and during the last six months of the cooperation term in order to examine the level of achievement.

VI. CLAIMS AGAINST JAPANESE EXPERTS

In accordance with the provision of Article VII of the Agreement, the Government of the United Mexican States shall bear claims, if any arises, against the Japanese experts engaged in technical cooperation for the Project resulting from, occurring in the course of, or otherwise connected with the discharge of their official functions in the United Mexican States except for those arising from the willful misconduct or gross negligence of the Japanese experts.

VII. MUTUAL CONSULTATION

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

VIII. MEASURES TO PROMOTE UNDERSTANDING OF AND SUPPORT FOR THE PROJECT

For the purpose of promoting support for the Project among the people of the United Mexican States, the Government of the United Mexican States will take appropriate measures to make the Project widely known to the people of the United Mexican States.

IX. TERM OF COOPERATION

The duration of technical cooperation for the Project under this Attached Document will be ( ) years from ,199 .

(Note)
The ANNEXES underneath will be attached.

ANNEX I MASTER PLAN
ANNEX II LIST OF JAPANESE EXPERTS
ANNEX III LIST OF MACHINERY AND EQUIPMENT
ANNEX IV LIST OF MEXICAN COUNTERPART AND ADMINISTRATIVE PERSONNEL
ANNEX V LIST OF LAND, BUILDINGS AND FACILITIES
ANNEX VI JOINT COORDINATING COMMITTEE
ANNEX VII ORGANIZATION CHART OF THE PROJECT

ANNEX 15 LIST OF ATTENDANCE OF THE DISCUSSION

THE JAPANESE SIDE

1 SUPPLYMENTARY STUDY TEAM

Mr. Makoto Yamashita	Leader
Mr. Kensuke Tasaka	Technical Cooperation Program
Mr. Hiroshi Tsukahara	Technology Transfer Program
Mr. Yoshiro Matsuyama	Non Destructive Test
Mr. Hideo Seno	Chemical Analysis
Mr. Yuichi Endo	Coordinator
Mr. Yasumasa Ito	Interpreter

2 EMBASSY OF JAPAN IN MEXICO

Mr. Takumi Watanabe	Second Secretary

3 JICA OFFICE IN MEXICO

Mr. Ken Kinoshita	Resident Representative
Mr. Yoshitaka Enomoto	Assistant Resident Representative
Mr. Daniel González González	Technical Secretary

THE MEXICAN SIDE

1 SRE

Emb. Alfredo Pérez Bravo	Director General de Cooperación Técnica y Científica

2 CONACYT

Dr. Alfonso Serrano Pérez Grovas	Director Adjunto de Coordinación del Sistema SEP-CONACYT
Lic. Carlos O'farril Santibañez	Director de Coordinación y Apoyo Institucional
Lic. Ana Hilda Gómez Torres	Subdirectora de Control y Seguimiento Operativo de la Dirección Adjunta del Sistema SEP-CONACYT

3 SECOFI

Lic. A. Humberto Noguera Blanco	Subdirector de Estudios Sectoriales Dirección General de Promoción Industrial

4 CIDESI

Ing. Angel Ramírez Vázquez	Director General
Ing. Cirilo Noguera Silva	Gerente de Tecnología de Materiales
Ing. J. Agustín Chacón Estrada	Gerente de Gestión Tecnológica
Lic. Jara Castillo Téllez	Jefe de Departamento de Comunicación y Difusión

資料２　長期調査員報告書

第1　メキシコ合衆国ケレタロ州周辺の中小企業の状況

調査員：塚原　宏
担　当：技術移転計画

1. 概　要

メキシコは1994年の経済危機以降、セディージョ現政権の下で国の輸出入バランスは改善され、現在、国家経済全体として回復基調にあるが、なお国内景気の本格的な回復までに至らない。

このような状況に対する現政権の経済政策の重点項目として中小企業振興が掲げられている。

メキシコ国内の中小企業は零細企業も含めると企業数では全体の98％を占め、また、従業員数では49％を占めている。

メキシコの製造業で重要な地位を占める業種は食品、次いで金属製品、3位に石油・化学となっている。

ケレタロ州はメキシコの中央部に位置し、昔から交通の要衝として知られている。

したがって国内にある自動車、電機などのメーカーに部品を供給するのにも好都合な位置にあり、その産業構成は自動車部品及び金属加工が約30％と最も多い。（別紙1参照）

周辺中小企業では近代大手自動車、電機メーカーの輸出製品に組み込まれる部品供給に参入を望む意欲が高く、そのため、ISO 9000に対する関心も大きい。

2. 地場産業調査結果

3月の調査で9社、7月には6社の地場産業と業界団体また2社の日系企業を訪問した。その個別調査結果の概要は別紙2のとおりである。

総括結果は以下のとおりである。

(1) 視察企業の印象は、訪墨以前に想像していたよりレヴェルが高いことである。

工場の整理整頓、清掃状態が全般的によく、製品の加工状態も外観的には良好であり、作業者の動きも悪くない。

CIDESIが無作為に選んだとはいいながら、あまり程度の良くないところをわざわざ紹介はしないと想像でき、これが全体的水準であるとはいえないが、視察先を優良企業と仮定して全体を推定すると、管理面を中心に考えた場合、まずまずの水準にあるといえる。しかし、以前に聞かされてきた話も根も葉もないこととはいえないとすると、ばらつきが大きいということなのか、あるいはケレタロ周辺がその街の印象と合わせ、この地域の先進性を示す結果なのかは分からない。

(2) どの企業でもISO 9000に対する関心は高く、大手及び中企業は既に取得している。小企業においても今秋から来年に掛けて受審を計画しているところが数社あり、予想外に普及している。この点では日本がむしろ出遅れているかもしれない。

メキシコでは、日本のように大企業が中小企業を系列において、その育成について面倒を見るような慣習はなく、ある水準に達した中小企業を取引先として選びそれ以下の企業は相手にしない。これは訪問したCENAM三谷部長の話にもある。

中小企業でISO 9000に関心の高いのは、上記の事情からエントリーの条件を獲得するツールとして考えているようである。

したがって、体裁を整える動機の方が大きいように思われる。管理体制、設備など受審以前の課題が多く見られるところがある。

しかし、この風潮は品質に対する関心を喚起する効果はあり、CIDESIの技術援助で品質問題に関連する分野の潜在的需要は大きいものと考える。

(3) 企業がCIDESIに依頼する材料・非破壊試験の量は個別的には現在それほど多くないが、ケレタロ州にある300社の輸出指向中小企業のニーズに応える活動をまず行い、また、大手企業も取り込むことにより手数料を適正なものとすれば、その需要は飛躍的に拡大するものと考える。

現在、CIDESIはこれらの中小企業に対する広報活動があまり行われていないので、その存在を周知すること、また、中小企業自体もこのような機関を利用することに積極的になるように啓蒙するが第一歩となる。

(4) 今後のCIDESIに対する中小企業の要望は多様であるが、今回の計画が対象とする材料・非破壊試験技術の拡充は、前記の品質向上の基盤をなすものと考えられる。

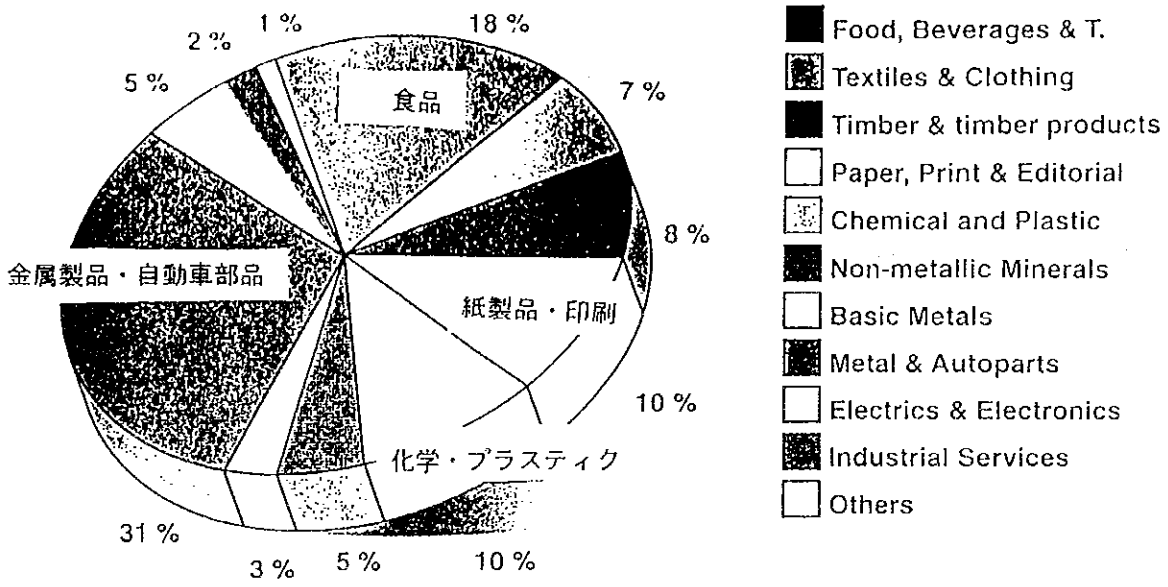
したがってCIDESIに対する技術移転は単に試験技術だけでなく、試験周辺の技術を含め向上を図り、中小企業製品の品質向上に寄与できるものとする必要がある。

今回の調査の中で製品品質向上を確実にする自動化の遅れが目に付いた企業がある。日本のように借金経営では成り立たないメキシコで、中小企業に負担の大きい自動化設備を推奨しても、一番問題となる中クラス以下の助けにならず、経済的負担を最小限とする半自動化設備など遠回りでも、確実に改善を積み重ねることに関心を高めることが重要と考える。

このような手法をとる場合、通り一遍の理論的対策では役に立たず、CIDESIの技術サポートは実際的かつ柔軟なものでなければならない。

また、依頼先の技術が高い場合、中小企業でも現状のCIDESIの水準では足りないケースもあり、そのようなニーズにも対応できるように、教科書的な知識でなく、応用分野での技術レヴェルを高めること、また、精度の高い試験を行う必要がある。

Industries by Activity

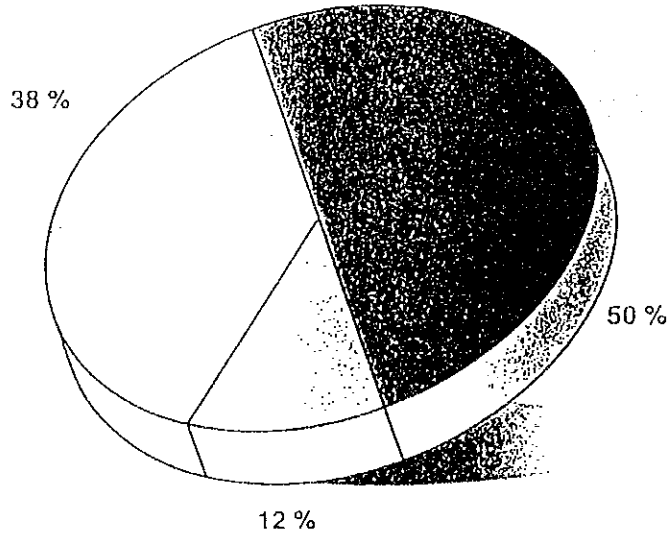


Source: Industrial Survey of Querétaro, 1995.

TOTAL: 632

Raw Materials Origin
(global of the industries)

TOTAL: 632



Source: Industrial Survey of Querétaro, 1995.

Origin of purchases

In order to promote the Import Substitution Program in the local industry promoted by SEDECO, it is necessary to know the origin of purchases.

Micro industry defined that 77.5% of their purchases are carried out in the state, 20.2% in the country and only 2.3% outside the country. Purchases in foreign countries increase depending upon the industry size. So, 39% of the small industries carry out their purchases in the state, 50.8% in other parts of the country and 10.1% in foreign countries. And 27.8% of the middle-sized indus-

別紙--2

企業訪問結果

企業名称	ALARS. A.	AUTOPARTES WALKER	GRUPO PALANCAS
面接者	ALBERTO ALROCER	ING. JORGE SUAREZ	ING. MIJUEL GOUZILEZ
職名	社長	製造課長	社長
所在地		FRACC. IND. SAN PEDR.	
資本金（ペソ）			
従業員数	17人（2交代）	150人	75人
製品	冷蔵庫取手（コロンビア向け）、自動車マフラーサポート	自動車マフラー（クライスラー社向けが80％）	自動車変速レバー（VW、日産など）
市場	家電メーカー等を通じ海外を目指す。	自動車工業	自動車工業
CIDESIとの関係	材料成分分析、四・五件／年	分析、溶接試験、寸法校正など、月4回程度	分析、溶接品質証明など、3か月に1回程度
技術的特長	小規模ながらプレス加工ラインを作り、日本からの輸入を不要にした。	自動化された生産体制	専門部品に集中した生産体制
技術的問題点		溶接部を抜き取りで破壊試験（溶け込み確認）しているのを非破壊試験に置き換えたい。	
技術移転への要望	試験設備の充実、工具（型）設計指導	自動化開発、非破壊試験技術の充実	自動車会社より要求される環境耐久試験などにも対処できること。
QC体制	5Sの実行、作業標準の作業者への明示、品質方針への全員署名などQCの基本を忠実に実施している。	量産体制の中での品質管理が一応整備されている。QS 9000を昨秋取得	作業員の記録とサンプル検査を行っている。QS 9000を本年中に取得を目指している。
工場の状況	工場入口に不良返却なし連続427日とある。	工場全体の自動化がかなり進んでいる。人の動きも良く、きびきびしている。	日本の中小企業に比べ、整理整頓は平均以上である。
所感	小企業ながら経営者の品質向上への熱意に感心させられた。	一部作業環境が発生ヒュームのため悪いところを除き近代的な工場といえる。	職人気質的なところのある経営者で、自社製品の品質に対する自負をもっている。

企業訪問結果

企業名称	INDUSTRIE DEL HIERRO	MAQUIAS SAVE	INDUSTRIAS ALDER
面接者	LIC. FRANCISCO PEREZ	LIC. SERGIO VILLASENOR	ING. ENRIZUE OLLATA
職名	労務部長	社長	社長
所在地	FRACC. PARQ. QRO.	FRACC. IND. JURICA	
資本金（ペソ）			
従業員数	750人	40人（交代制）	120人
製品	圧力容器、タービン部品、大型構造物など	自動車・家電などのメッキ品	実験台、ドラフトチャンバーなど
市場	墨最大のゼネコン系列にある。	自動車・家電など	医療・理工実験装置
CIDESIとの関係	参加の中小企業指導を依頼する協定を結んでいる。	分析など	溶接技量試験、寸法校正、品質管理指導など
技術的特長	大型設備による単体機器製作		
技術的問題点			
技術移転への要望	中小企業へのCAD教育、プラスティック金型技術指導など	企業の変化に応じた能力の拡大に努めてほしい。	
QC体制	ISO 9000、ASME U、U2など多くの資格を保有している。	ケレタロ品質賞を受賞。発注仕様追随型である。	ISO 9000取得準備中。既にマニュアルは完成し、それに従って生産を実施中である。
工場の状況	機械工場の清掃状態は良いが、製缶工場はやや乱雑。溶接外観は良い。	工場内はあまり整頓されていない。	工場内に品質方針を掲示したりしているが、整理整頓状態はあまり良くない。
所感	このような大型機械工場があるとは予想しておらず、驚いた。	特にない。	ISO 9000が紙だけで走りそうな懸念がある。

企業訪問結果

企業名称	AUTOTANQUES NIETO	MEXINOX	PAILEMEX
面接者	ING. ARTURO BUSTOS	JUVIERAVILA MENDOSA	ING. MICHAEL KUFNER
職名	保全部長	研究開発部長	社長
所在地	FEBRERO ZONA IND.	ZONA IND. SAN L. POTSI	ZONA IND. SAN L. POTSI
資本金（ペソ）			
従業員数	220人（整備部門）	1,100人	78人
製品	アンモニア、LPGタンクローリなどの整備（LPG供給会社の部門）	ステンレス薄板（原料インゴットより圧延のみ）	ステンレス化学機器
市場		アメリカ輸出及び国内	同系列化学会社
CIDESIとの関係	タンクの定期検査	非破壊試験、ロールの破壊原因調査など	溶接技能試験
技術的特長			
技術的問題点			
技術移転への要望	現場でのRT実施など非破壊試験範囲の拡大	試験能力の拡大。また、ラボのQA、標準化指導など	製薬プラントへの進出に備え技術指導を受けたい。
QC体制	PEMEXの支持によって行っている。ローリ運転員に対する安全教育は確立されている。	ISO 9002を昨秋取得。CENAMより第2次計量認定を取得準備している。	系列内の仕事だけなので認定は取得しなかったが、タンクローリ修理のためASMEスタンプ準備中
工場の状況	日本では体制が違うが、これだけすべてに対応できる整備工場はないのではないか。	すべて完全に自動化され、日本のメーカーと変わらない。	工場内は整頓されているといえないが、溶接外観は優れている。
所感	一見した範囲では立派なものである。CIDESIは固定設備の検査業務開拓を見過ごしている。	整備された工場で、面接者の姿勢も好感が持てる。余分のサンプリング試験が多くこの国では相互の信頼に欠けるのが仇となっている。	社長の職人技術でリードしている企業である。

企業訪問結果

企業名称	PESORTES DE CALIDAD S. A.	IDASA DE C. V.	TROQUELADOS Q. S. A. DE C. V.
面接者	ING. J. PALACIOS H.	ING. F. GRANADOS	LIC. J. QUEZADA
職名	QA担当（実質工場長）	製造部長	管理部長
所在地	PARQUE IND. JURICA	AGRO-IND. LA CRUZ	P. IND. BERNARDO QUIN.
資本金（ペソ）	264,000	企業グループに所属	3,000,000
従業員数	17人	100人	36人
製品	各種中小型バネ製品（トラクター、自動車、電機、家電、その他）	溶接ステンレス管（3／16－40in.）、オーステナイト系、一部フェライト系（排気管用490）	自動車サスペンション
市場	シーメンス、シンガーなどの現地法人、マベ（洗濯機）など	南北アメリカなど10か国に70％を輸出している。化学工業、食品工業	交換部品販売が当面の目標で、自動車メーカーへの部品納入は次の課題。
CIDESIとの関係	自動化設備の開発、ISO取得指導、材料試験	原材料の分析依頼	計量校正、熱処理、品質管理指導依頼
技術的特長	多品種対応	多様な製品対応	交換部品でも品質確保
技術的問題点	主要工程の自動化、素材の識別管理の改善	熟練工に頼った設備で、品質の不安定が懸念される。	金型技術を自力で開発しなければならない。
技術移転への要望	中小企業の相談に具体的かつ単純な方策を示して指導してもらいたい。	依頼試験処理能力の充実。	金型についてのエンジニアリングを望む。
QC体制	年末ISOを取得する目標でCIDESIの指導で進めている。	一・二年後のISO取得を目指しているというが、先に行うべきことがかなりある。	ISO取得を目標として、従業員の意識改革をまず行う。
工場の状況	手作業をまず半自動化する必要がある。	現場の整理整頓が今回の内最悪、酸洗後の表面もむらが多い。	プレス設備も整っているが金型加工設備は不十分。
所感	面接者は改善意欲が高く、今後の発展が期待できる。	現在の製品に満足していると、競争に敗れる懸念がある。	技術の見通しなしに設備を作り上げてしまったようである。

企業訪問結果

企業名称	INDUSTRIAS CAMSA S. A. DE C. V.	INDUSTRIA DE MICROTROQUELADOS	COLORADO CASTINGS. S. DE R. L.
面接者	ING. ARTURO CAMPOS G.	FISCHER SIEGFRIET	ING. JOSE LUIS JACOBO
職名	工場長	社長	生産部長
所在地		FRACC. IND. BENITO J.	FRACC. IND. LA CRUZ
資本金（ペソ）	USD 1,000,000		
従業員数	180人	65人	55人
製品	プラスチック成形（家電自動車部品、医療ハーネスなど）、板金プレス（家電自動車部品）、金型製作	板金プレス：家電、自動車部品	鋳造（ねずみ鋳鉄：トラクターなどのクラッチプレート、その他少ロット鋳造品）
市場	ブラック＆デッカー、シンガー、ロックウエルを通じ輸出80％	家電：ブラック＆デッカー、シンガー、自動車：ガブリエル	クラッチ：ニューホランド
CIDESIとの関係	計量校正、及び技術試験、化学分析を依頼	計量校正のみ。材料関係はサプライヤーに依頼	材料試験、分析試験を依頼
技術的特長	ジャストオンタイム、フレキシブルな対応	高速加工設備を整えている。また、組立工程を取り込む計画を進めている。	技術者及び作業者の経験が豊かである。
技術的問題点	樹脂の知識がある作業者の育成、金型設計、プラスチック材料試験が付近で依頼先がない。	金型設計及び組立工の能力向上。	納入先からQS 9000取得を求められている。プラントの自動化が必要である。
技術移転への要望	上記問題点の内、材料試験をCIDESIで処理できることが望まれる。	技術者能力向上のための教育訓練	依頼試験への対応力を高めること、及びQS 9000取得指導を望む。
QC体制	ISO 9002を今秋、9001を来年、QS 9000を再来年計画。準備の進捗が現場で見える。	ISO 9002をUL（米国）から今秋取得目標としている。ULとしたのは納入先の要望による。	品質改善のため、従業員教育を実施しているとのこと周辺農業労働者採用の意識改革も含まれる。
工場の状況	プラスチック金型は新式の放電加工機などを備え、設備は充実している。	ドイツ風で、工場内は緊張感がある。プレス機械は確かに早い。	手作業が中心で、測定設備も不十分である。
所感	素材、製品が乱雑に置かれているのを除けば、昨日の工場から見てかなりグレードは高い。	今回の視察工場の中で最も技術的に優れている。材料関係では、CIDESIは対応力を高めないと相手にされない。	自動化、計測設備の不足などQA体制以前の問題があると考える。

1997年7月27日

第2　業界団体訪問

CANACINTRA　QUERETARO

会長 PEDRO　GALVAN　VALEDRRAMA氏

CANACINTRAは加工業団体であり、そのケレタロ支部をCIDESIラミレス所長の案内で訪問した。結果は下記のとおり。

1. ケレタロの企業の95％が中小企業であるが、CIDESIに仕事を頼もうとする企業はその中で輸出に関係している200～250社であり、その他はCIDESIの存在を知らないか、どのように利用すればよいか分からない企業である。経済危機以前は国外市場にあまり魅力を感じていなかったが、経済危機が契機となって、意識改革が起こっている。

2. CIDESIに期待する仕事は第2次計量施設として信頼できること、製造に関係するところでは具体的に答えが得られること、また、金型技術への対応がある。
   いずれにしても企業のニーズを的確にとらえた活動が期待される。

3. 金属加工業種が多い今の構造はまだ少なくとも10年は続くことが考えられる。
   ケレタロの代表的発展企業はセラメッセ、またスパイサーなどである。

4. 企業経営者の共通の関心は国内市場の回復が遅く、供給過剰の状態をなかなか脱しないこと、また、品質システムの構築であり、ISO 9000対応企業の多さはケレタロがメキシコの最先端をいっている。

5. CIDESIの技術分野の強化に伴い、処理能力が拡大した場合、業務を拡大するには、今後の輸出産業を目指す中小企業への働きかけを今以上に拡充することである。
   計量分野は今後飛躍的に需要が伸びる見込みであるが、さらに必要な施設は環境関係の計量である。

6. 業界に関する情報提供にはいつでも応じる用意があるとのこと。

この会長は計量に非常に関心を示していて、その他に話を持っていっても、いつの間にかまた計量の話に戻っている。このプロジェクトへの要望は具体的にはないが、ケレタロの発展に寄与していただきたいという程度のものであった。

1997年10月3日

第3　技術移転について

1.　技術移転の内容

CIDESIでの材料試験及び非破壊試験に関する活動の状況を図－1により示すと、現在のCIDESIの活動はゾーン1及び2の一部に限られている。

技術移転が完了した時点でその活動領域はゾーン3に拡大される。

これらの領域での活動のレヴェルは材料試験及び非破壊試験に関する知識経験だけでなく関係産業の製品に関する技術についての知識経験のいかんにかかっている。

したがって、CIDESIの行う試験は単に受け身で依頼された試験を行うだけでなく、試験適用の妥当性、試験結果から導き出される対策などの技術指導も併せて行えるように、この技術移転内容は試験方法だけでなく、金属材料及び非破壊試験に関する基礎理論の応用展開及び中小企業製品に対する理解を含む必要がある。

また、技術移転期間中に行う中小企業向け技術セミナーの開催あるいはその企業巡回指導により、技術移転の対象をCIDESI内のカウンターパート（C／P）だけに止まらず、ケレタロ州周辺の中小企業並びに関係機関の技術者も包括したものとする。

2.　技術移転の対象分野及び項目

専門家が技術移転の対象とする分野は下記のとおりである。各々の分野を担当する長期派遣専門家により実施する他、関係技術を保有する短期派遣専門家により長期専門家の専門外の事項について補完する。

(1) 材料試験（機械試験・組織試験）

(2) 材料試験（化学成分分析試験）

(3) 非破壊試験

上記の各分野には必要に応じてそれぞれの技術移転に必要な金属材料・溶接・品質管理などの基礎技術が含まれる。

専門家がCIDESI内のカウンターパートを対象として行う技術移転の項目は表－1の通りである。

3.　技術移転の詳細

長期専門家による技術移転は、主として依頼試験実施、企業巡回指導及びセミナー・研修開催時のオンザジョブ・トレーニングを通じて行い、それに併せ基本的技術知識の補強のための座学を実施する。カウンターパートの技術評価はオンザジョブ・トレーニングを通じて行い、そ

の結果はそれ以後の指導に反映させる。また、この間、依頼試験において集積された問題点はカウンターパート及び企業への指導教材とする。

(1) 依頼試験

依頼試験はCIDESIが従来より実施している材料試験及び非破壊試験に関する部分の全般を対象とし、さらに技術移転期間を通じてその拡張を図る。

専門家は必要に応じて、

a) CIDESIと依頼者との協議に立ち会う。

b) カウンターパートの作成する試験仕様を照査する。

c) 試験実施時の立会指導及びカウンターパートの作成した試験報告の照査を行う。

これらを通じて、問題点とその解決方法を蓄積して、関係者全員に対して事例研究の座学を行い、当事者だけでなく関係者全員に指導を徹底する。また、カウンターパートの技術評価を行い、その後の指導に反映する。

依頼試験対象の問題について事例収集を行い、中小企業指導の具体的教材とする。

(2) 巡回指導

企業巡回指導はまず依頼試験元を対象として、依頼試験に表れた技術的問題点を現場にさかのぼる形で行い、その対策を提案する。次に要望のある企業に対して、材料試験及び非破壊試験において頻発する問題点の解決を目的としてアプローチする。

企業巡回指導の範囲は必ずしも材料試験及び非破壊試験の範囲に限定しないが、上記のように着手ポイントを明確にした上で、順次相手の要望あるいはCIDESIの技術力に応じて拡大を図る。専門家は下記の項目について技術移転を行い、直接指導を行うことは、必要最小限に止めるものとする。

また、企業巡回指導を通じてカウンターパートに中小企業製品に関する技術の実態と問題点についての認識を深めさせることは、中小企業に対する技術指導とともに重要であり、専門家はこの観点に立った指導を心がけるものとする。

1) カウンターパートの作成する巡回指導計画の照査

2) 巡回指導立会及び助言

3) カウンターパートの作成する改善勧告・指導文書の照査

(3) 技術セミナー・技術研修

技術移転期間中に行う技術セミナー・技術研修は下記のとおりとする。

参加者の範囲は前記1.項に示すとおりとする。

1）カウンターパートを対象とする座学の一部の外部開放

2）外部を対象として、半日あるいは1日程度の時間内に行う啓蒙的内容のもの

3）同様の形式で行うややレベルの高い技術テーマに関するもの

4）参加者に終了書あるいは合格書を授与する形式で行う研修課程

専門家はこれらの開催にあたり、次のとおり技術移転を行う。

技術移転当初は専門家自身が講師となって行い、以後順次上記2）項のような比較的容易な内容のものからカウンターパートを講師とする形式に移行し、技術移転期間末期にはカウンターパートに技術移転成果を示すような内容で講師を担当させ、その理解度を確認し、その不足する部分について補完する指導を行い、技術移転を完了させる。

1）カウンターパートの作成するセミナー・研修計画の照査

2）教材の作成協力又は指導

3）一部の講師担当及びカウンターパート講師の事前及び事後指導

(4) 座　学

座学はカウンターパートの応用技術力を高めることを重点とするため、専門家が一方的に講義形式で行うことを避け、オンザジョブ・トレーニングにおいて生じた問題点を題材に編集して教材とするワークショップの形式で行うとともに、あらかじめ指定したテキスト又は資料に対する自習結果の疑問点に答える形で必要に応じて実施する。

専門家は教材として自己の経験及びオンザジョブ・トレーニングにおいて収集した事例など、できるだけ多数の具体的な事例（問題点、失敗例、事故例など）を紹介することにより、その範囲を拡大する。

(5) 短期専門家による技術移転

短期専門家による技術移転は長期専門家の専門技術以外の部分の補完及び導入設備の内特に取扱い・保全について実習訓練を要するものについて行う。

また、その滞在期間中、その専門技術についてのセミナー・研修の講師を依頼する場合がある。現時点での計画案は表2のとおりである。

(6) 国内研修

CIDESIあるいはCONACYTのカウンターパートを対象として、毎年二・三名の研修生を日本に招聘して、原則としてメキシコ国内で行うことが難しい技術内容の研修、すなわち現地において機会がなく修得できない種類の製品又は試験で、しかも今後の対応が必要と考え

られるものについて行う。その内容は別に定める。

(7) その他

専門家はCIDESI内に技術移転期間以後も期間中に確立した中小企業技術指導のための技術支援業務が継続的に実施できる体制作りを指導する。

また、CIDESIの保有する規格、技術図書を整備して、これらの利用を中小企業に開放する体制を作る。

4. 技術移転の評価

技術移転結果の評価はCIDESI自体の試験実施能力の向上とCIDESI外部の技術向上に及ぼした成果の両面でとらえられる。

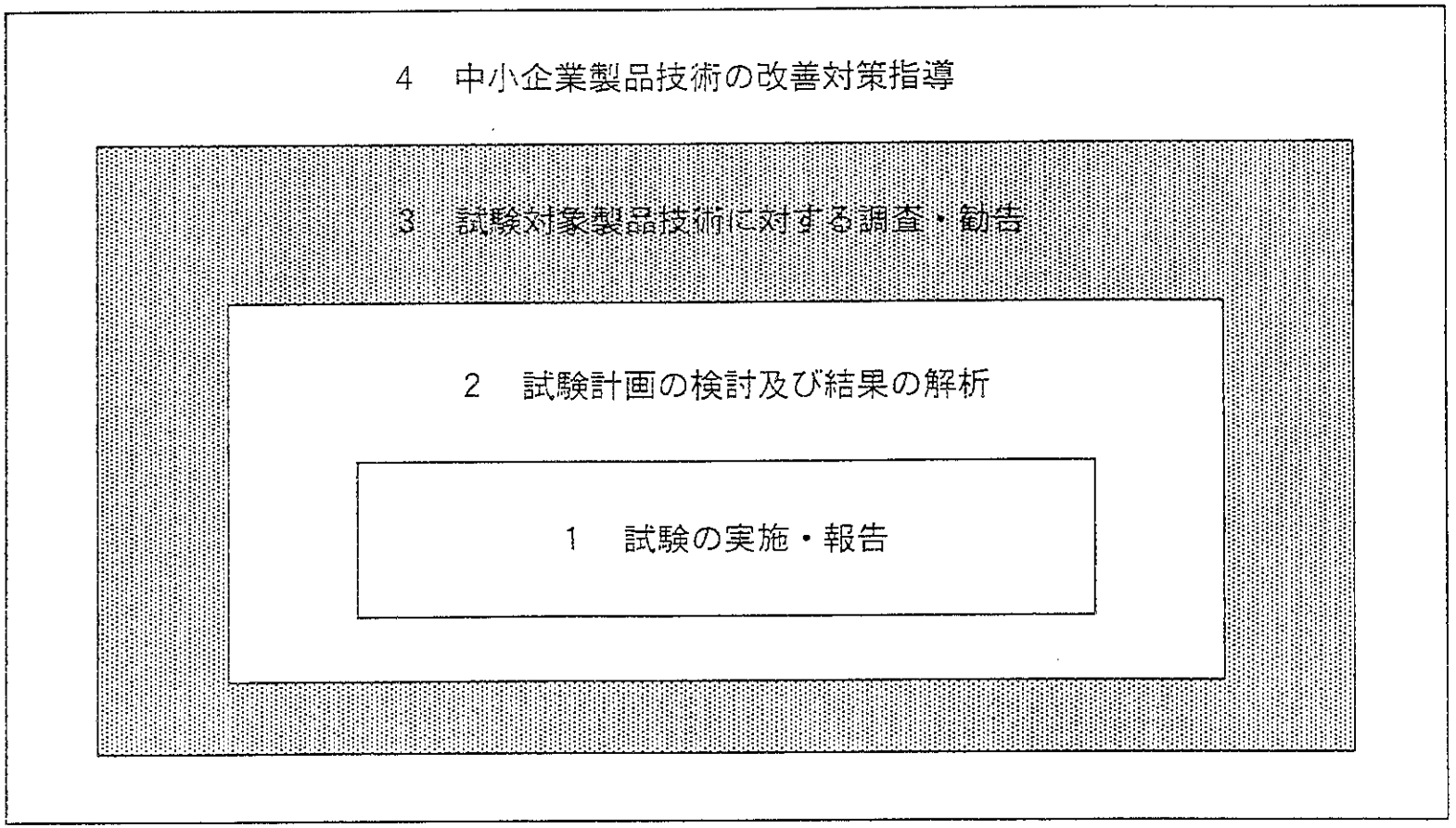
CIDESI自体の試験能力の向上は体制の構築、設備の拡充及び試験技術者の技術向上によって構成される。

各カウンターパートの能力の評価は次の要素によって総合的に行う。

(1) 依頼試験、企業巡回指導及びセミナー・研修の実施時の技術評価

(2) 表－1を基準とする各技術要素に対する理解度を自己申告、上司の評価及び専門家によるヒアリングによる評価の集約

図－１　技術移転のスコープ（今回の技術移転の範囲は３の領域まで）



表－1　技術移転項目

	対象カウンターパート
A　試験共通技術	全員共通
1. 金属材料	
1. 1　金属材料	
1. 2　各種材料の特性	
1. 3　金属の劣化	
2. 溶接及び金属加工	
2. 1　溶接冶金	
2. 2　溶接施工法	
2. 3　金属成形	
2. 4　熱処理	
2. 5　表面処理	
3. 品質管理	
3. 1　品質について	
3. 2　品質管理方法	
3. 3　品質保証体制	
4. 試験の基礎	
4. 1　規格・基準	
4. 2　統計処理	
4. 3　試験所の管理	
4. 4　試験所の安全衛生管理	
4. 5　試験所の環境管理	
B　材料機械・組織試験	機械・組織試験
1. 試験方法	
1. 1　機械試験	
1. 1. 1　引張り試験	
1. 1. 2　圧縮試験等	
1. 1. 3　硬さ試験	
1. 1. 4　衝撃試験	
1. 1. 5　疲労試験	
1. 1. 6　その他の試験	

1．2　　組織試験

1．3　　破面解析

2．試験設備機器

3．試験に関する技術

3．1　　金属材料強度

3．2　　溶接施工技術

4．破壊解析

C 化学成分分析　　化学分析

1．試験方法

1．1　　分析準備

1．2　　分析方法

1．2．1　　湿式化学分析

1．2．2　　原子吸光分析

1．2．3　　ICP分析

1．2．4　　発光分析

1．2．5　　蛍光X線分析

2．分析機器

3．分析試験技術

D 非破壊試験　　非破壊試験

1．非破壊試験方法

1．1　　外観試験

1．2　　放射線透過試験

1．3　　超音波探傷試験

1．4　　磁気探傷試験

1．5　　液体浸透探傷試験

1．6　　渦流探傷試験

2．試験機器

3．試験に関する技術

3．1　　金属材料強度

3．2　　溶接施工技術

4．材料及び溶接の欠陥評価

表－2　短期専門家派遣予定

題　　目	短期専門家	派遣時期	派遣期間
破壊力学　概論		1998. 秋	15日間
破壊解析(1)		1999／2000	15日間
同(2)		1999／2000	1.5か月
同(3)		1999／2000	1.5か月
最近の溶接技術		2000	15日間
最近の非破壊試験(1)		2000	15日間
同(2)		2000	15日間
試験機関の認証		1999	1か月
金属材料の腐食及び防食		2000／2001	2か月
非破壊試験の信頼性		2000／2001	2か月
ISO 9000体制の保持における問題		2000～	1か月
品質向上の実施		2000～	3か月
電子顕微鏡操作及び破面観察		1998. 秋	2か月
小型材料試験機操作技術		1998／99	2か月
環境計測分析技術		1999. 前半	3か月
ISO 14000への対応		2000	1か月

第４　供与機材一覧表

設備種類	設備名称	主要仕様	基数	既存設備
組　織　試　験	走査型電子顕微鏡		1	光学顕微鏡３
	微小硬度計	自動荷重デジタル表示	1	旧型１
	顕微鏡試料研磨盤	半自動、重研磨	1	旧型１
	同電解研磨装置	自動調整	1	旧型１
	同埋込装置	自動調整	1	旧型１
機　械　試　験	万能試験機	100t、AD表示	1	30t試験機
	精密万能試験器	1t、	1	なし
	ロックウエル硬度計	デジタル表示	1	旧型１
	ブリネル硬度計	電動荷重デジタル表示	1	なし
	衝撃試験機	シャルピー式	1	シャルピー１
化　学　分　析	蛍光Ｘ線分光分析器		1	なし
	原子吸光分析器		1	旧型１
	分光分析器（移動式）		1	なし
	分光分析器（固定）		1	ICP　1
	分析試料準備装置	マイクロ波加熱	1	なし
	ドラフトチャンバー		1	
	換気装置		1	
非　破　壊　試　験	工業Ｘ線装置	30kvp1	1	25kvp1
	磁粉探傷器		1	１式
	超音波探傷器	探傷器及び厚さ計	2	３式
	渦流探傷器		1	旧型１（使用不可）
	溶接欠陥サンプル		1	なし