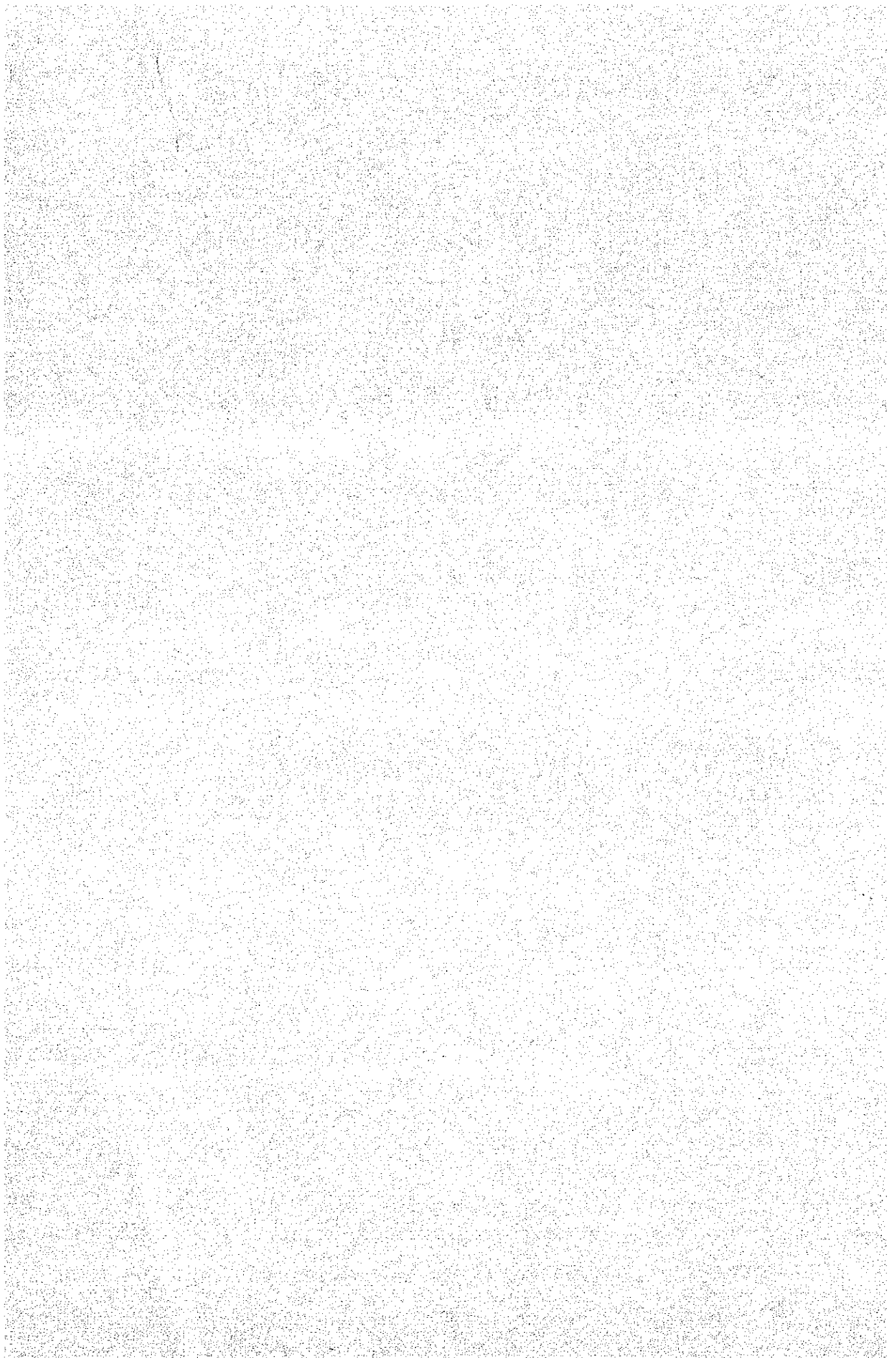


資 料 Ⅳ
PITAC 活 動 状 況



P I T A C

BRIEF BACKGROUND, FUNCTIONS AND ACTIVITIES

Pakistan Industrial Technical Assistance Centre (PITAC) was constituted as a Semi Autonomous Unit by merging, Industrial Research & Development Centre (IRDC) and Industrial Productivity Centre (IPC) in March 1962.

The IRDC and the IPC were projects which were funded by US AID. PITAC has its Headquarters and main workshops at Lahore and Liaison Offices at Karachi and Peshawar. The General Manager of PITAC is Brig. Gul Muhammad Khan Jadun.

Since 1962, PITAC is dealing with the metal trade sector of the industry and making efforts to improve productivity in the industrial concerns thereby contributing to the national economy.

PITAC was established with the objective of giving adequate impetus to productivity and thereby accelerating the pace of economic growth in the country. The main objectives are:-

- (a) To train and upgrade the skills of industrial personnel in the technical and managerial fields, by providing advanced technical training.
- (b) To disseminate modern technical know-how among industrial personnel through seminars, group discussions, demonstrations, publications and film shows.
- (c) To design and manufacture Jigs, Fixtures, Gauges, Moulds, Dies, Tools and products (proto-type) for industries.
- (d) To help the industries in improving quality of their products, increasing production, reducing costs, utilizing indigenous raw-materials and expanding the scope of indigenous manufacture.
- (e) To extend Advisory Services to industrial organizations, primarily in the private sector to solve their individual in-plant problems including installation techniques.

TRAINING:

Higher productivity cannot be achieved only with expensive equipment unless we prepare the personnel to operate them efficiently and enable them to produce quality products at competitive prices by proper use of equipment and improved techniques. PITAC's training programmes caters to the requirements of the firms and the trainees are given training in the field desired by the industry. The aim of this training is to make the trainee carrying out the works independently with confidence.

PITAC training programmes differ from those of other training institutions because here the training imparted is almost tailor-made to suit each trainee on the basis of knowledge already possessed by him. The training programme is designed so as to give a multiplier effect.

Since March 1963, PITAC has also been offering training facilities to fresh Graduate Engineers and Diploma Holders to provide them practical training, and to prepare them to face the problems on the shop floor with confidence. The courses are constantly reviewed and revised.

The Centre offers the following types of Advance Training Courses for trainees from private/public sector industries and from Defence Services:

- (a) 4-10 weeks Advance Training Courses for skilled tradesmen in various trades.
- (b) 24-weeks Engineers Courses for fresh Graduate Engineers and diploma-holders.
- (c) 1-week courses on Introduction to Low Cost Automation techniques.

The Advance Training Courses are offered in the following fields:-

- (a) Machine & Fixture Design.
- (b) Die, Mould & Tool Design.
- (c) Advance Machine Shop Practice.
- (d) Precision Tool Making.
- (e) Heat Treatment.
- (f) Pattern Making & Foundry Practice.
- (g) Welding & Sheet Metal Fabrication.
- (h) Protective & Decorative Coatings.
- (i) Die & Free Forging Practice.

A well equipped Low Cost Automation Laboratory has recently been set up and one week course for Engineers are being run on a quarterly basis since 1981.

PITAC also undertakes to design and run courses to suit the particular requirements of the industry.

The equipment available at Lahore Workshops is sophisticated and modern and suits the requirements of training to be imparted. For achieving concrete results of the training objectives the Centre makes use of the services of PITAC's qualified expert engineers and staff.

CHOICE OF TRADES:

For Engineers, supervisors and for such persons as may be engaged in production activity, the Centre can advise on the choice of trades, the extent of skill required of him in different trades and the duration of training in each trade. In such cases a person may opt for two or more trades in two or more consecutive courses. There has been instances where such persons who were to supervise operations in a host of shows were given training ranging from 6 months to over a year. Some of them were from a foreign countries, like Tanzania and Somalia.

TRAINING AIDS:

Though the training in PITAC is practice oriented, the trainees are given lectures and shown technical films and film slides. Printed handouts on various trades are distributed to them on the subject of their training. The Centre is equipped with good reproduction equipment to produce training aids material.

TRAINING ABROAD:

In order to keep its personnel abreast with modern techniques in developed countries, PITAC arranges for training of its engineers and staff abroad through various international agencies like Asian Productivity Organization, United Nations Industrial Development Organization. The Colombo Plan etc.

MANUFACTURING

PITAC Workshop at Lahore consists of the following shops/sections:

Industrial Engineering Section

Design Section

Machine Tool Shop

Protective Coating Shop

Welding Shop

Heat Treatment Shop

Sheet Metal Fabrication Shop

Foundry

Pattern Making Shop

Maintenance Section

Inspection

The largest shop is the Machine Tool Shop which is equipped with general purpose machine tools, special purpose machine tools, and precision machine tools. A wide variety of different types of machine tools are available for production as well as training-cum-demonstration purposes.

The Design Section is well staffed and one of the most important elements of the workshop, as all design work is carried out here. The design section specializes in designing moulds, dies, press tools, gauges, jigs and fixtures. In addition to normal designing activities, advanced training of draughtsmen is carried in various specialized fields.

The other shops are well-equipped with modern machines for production as well as training, and also provide in-house facilities for production jobs in the Workshop.

PITAC specializes in the manufacture of moulds, dies, press tools, jigs, fixtures, gauges, and precision spare parts for the industry in Pakistan. The nature of work done calls for high precision and excellent quality, so the Quality Control Section is equipped with adequate testing equipment and reference standards.

The majority of the work carried out is innovative in nature and is usually of one of a type. This type of development work requires skill in designing the production of working drawings then the manufacture of the parts to rigid specifications, their inspection, and the testing and adjustments to obtain the required results. These quality products require the

use of specific standard of raw-materials. So PITAC imports and keeps in stock special and alloy steels required for the manufacture of these components. The actual manufacturing requires skilled operators, who attain these skills through in-house training.

PITAC is the pioneer unit in the country which is in the field of the manufacture of sophisticated multi-cavity dies, progressive press tools, precision gauges, and other tools of production. With the production of such tools by PITAC the object is to improve the productivity of the manufacturing units, as well as to encourage the local industry to set up such facilities.

INTERNATIONAL CO-OPERATION

Pakistan is a founder member of Asian Productivity Organization (APO) based in Tokyo. The APO is a regional organization set up in 1961 to hasten the economic development of the member countries of the region, and to improve productivity in these areas.

PITAC represents the Government of Pakistan on the panel of APO member countries. It is acting as a National Productivity Organization and is actively taking part in APO activities since 1961. PITAC arranges for training programmes, seminars etc; sponsored by APO as well as for the provision of expert advice through the Technical Expert Services.

RESEARCH & DEVELOPMENT ACTIVITIES

With a view to provide low cost but standard machines to the small industry, PITAC has developed a few machines. These are a surface Grinder for general purpose grinding which gives a finish between 5 to 7 micro-inches using 100 grit wheels. The design was specially developed for achieving simplicity in construction to reduce manufacturing cost and simplifying maintenance and operation and yet obtain sensitive, and precision performance. Another notable development is the production of Universal Die Filing Machine. It is a simple machine but a compact one capable of performing all sawing, filing and lapping operations with accuracy and speed. These machines are moderately priced and are manufactured and sold against customer requirements.

Work is in hand on the development of a Bench Type Vertical Milling Machine. The machine has been designed to carry out machining operation

on small size dies, mould and parts. Work is also being done on a Die Lifter capable of mounting and sheating of heavy Dies. A Hand Press of 5 Tons capacity is almost complete and is under trial.

PITAC has been instrumental in developing the production techniques for all spare parts used in the cigarette industry, so that new NO imports of such parts are being made by the Pakistan Tobacco Company. With technical advice and the manufacturing advice from PITAC, a number of such precision spares are now being manufactured by a local industrial unit.

PUBLICATIONS

A quarterly magazine "PAKISTAN PRODUCTIVITY" is published by the Centre. The magazine carries articles contributing to different aspect of productivity in the industry, and on technical topics. Booklets on various subjects related to productivity and technology are published for distribution among engineers, managers, institutions etc. PITAC has a well equipped Reproduction Section and all the material like write-ups, handouts, books etc. for distribution to the trainees are printed in the section. The training material is printed in English and Urdu languages. As the emphasis is going to be on Urdu in future, PITAC will also publish various booklets in Urdu also after translation for English.

A recent addition to our publication is a quarterly Bulletin of Abstracts containing abstracts of articles of interest pertaining to the metal trades selected from a number of magazines, photo-stat copies of full articles are sent on request of subscribers.

LIBRARY

A technical library with a large number of books and international magazines and periodicals is available in the Centre to cater for the trainees requirements.

ACCOMPLISHMENTS IN THE LAST THREE YEARS

PITAC conducted 72 Training Courses in the last three years ending June 1983 which were attended by a total of over 454 trainees. In addition, special long term courses ranging from 6 months to one year were arranged for trainees sponsored by Overseas Workers, Foundation and State Cement Corporation of Pakistan. A industrial engineer from Tanzania was nominated

by UNIDO to undergo a 52-weeks specially designed course during 1970-71. Three Somalian trainees were trained in machine operations during 1978 for a three month period. During the current year 2 Nepalese engineers are being trained by PITAC under a UNIDO training programme in the field of Foundry Technology for a period of 12 weeks. The other agencies involved in this training are Metal Industry Research and Development Centre (MIRDC) and M/s. Ittefaq Foundry Ltd.

A step has been taken to introduce the concept of Low Cost Automation in Pakistan. For this purpose a well equipped laboratory with pneumatic LCA techniques has been set up through UNIDO assistance. Four courses on LCA have been run for engineers and managers from the industry. One-day seminars in Low Cost Automation were also arranged in Lahore and Karachi for top executives to introduce to them the benefit of the LCA. An LCA Expert From APO has been assisting PITAC for short periods in setting up and planning the LCA course. PITAC has now submitted a project to the Ministry of Industries, Government of Pakistan, for upgrading the LCA laboratory to a Development Cell.

PITAC also organized a Supervisory Development Training Course from 3 - 22nd March, 1984. The course was of international level and was organized with the cooperation of Asian Productivity Organization (APO), Tokyo. A total of 23 participants from 10 APO member countries participated and representative from ILO. The Punjab University and Private Sector management consultant played a very important role in successful implementation of the course.

During the last three years, PITAC Workshop completed about 1914 jobs consisting mainly of dies, moulds, machines parts, gauges etc. which were of great importance to the industry, and which helped in product improvement and increased production.

The engineers of the Centre gave advisory and consultancy service to 70 units. These include design and development of new sections of roll-passes for rolling of M.S. bars, strips, sections, Channels, etc. and improvement of quality of products of a number of industries, supply of layouts for new installations commissioning of machinery and plants etc.

FUTURE PLANS

The increasing rate of industrial activity within the country has resulted in increased demand for the productions. Of the tools of production, the requirement of increasing the skills of the technicians and the need for increasing productivity requires a greater input of technical on-the-floor advice. It is also felt that there will be an increased need for transfer of technology adapted to local condition specifically for the small manufacturers.

In order to meet these challenge, PITAC has proposed some projects to the government of Pakistan. One of these pertaining to modernization and balancing of PITAC is already underway with the assistance of Japan International Cooperation Agency (JICA). The remaining projects are under active consideration of the government.

A BRIEF ON THESE PROJECTS IS AS FOLLOWS:

1. Balancing and Modernization of the Workshop Facilities at PITAC, LAHORE

This project envisages introduction of numerically controlled machine tools. The total cost of the project is Rs. 9.985 million with a foreign exchange component of Rs. 7.880 million. It is due for completion by the end of 1985. The JICA is meeting all the expenses concerning supply of capital goods, training and advisory services.

2. Setting up of a Low Cost Automation Development Cell

This project envisages upgrading of the existing LCA Laboratory. The total cost of the project is Rs. 0.994 million with a foreign exchange component of Rs.0.860 million. The duration of the project is 12 months. UNDP is expected to provide funds for this projects as it had done earlier in providing some basic training equipment to PITAC.

3. Establishment of Production Cum Training Workshop at Peshawar

The need for Workshop facilities similar to the one at PITAC, Lahore is being felt in NWFP for a long time. The project cost is Rs. 62.250 million with foreign exchange component of Rs. 42.250 million. The duration of the project is planned for 48 months in 4 phases. We hope to get technical assistasnce through Italian Government. The project is under the active consideration of the Government.

4. Establishment of Production Cum Training Workshop at Karachi

Karachi is the biggest industrial city of Pakistan. There is a need for a similar workshop there also. The cost of the project is estimated at Rs. 89.959 million with foreign exchange component of Rs. 62.259 million. The duration is 48n months. This project is under consideration of the Government.

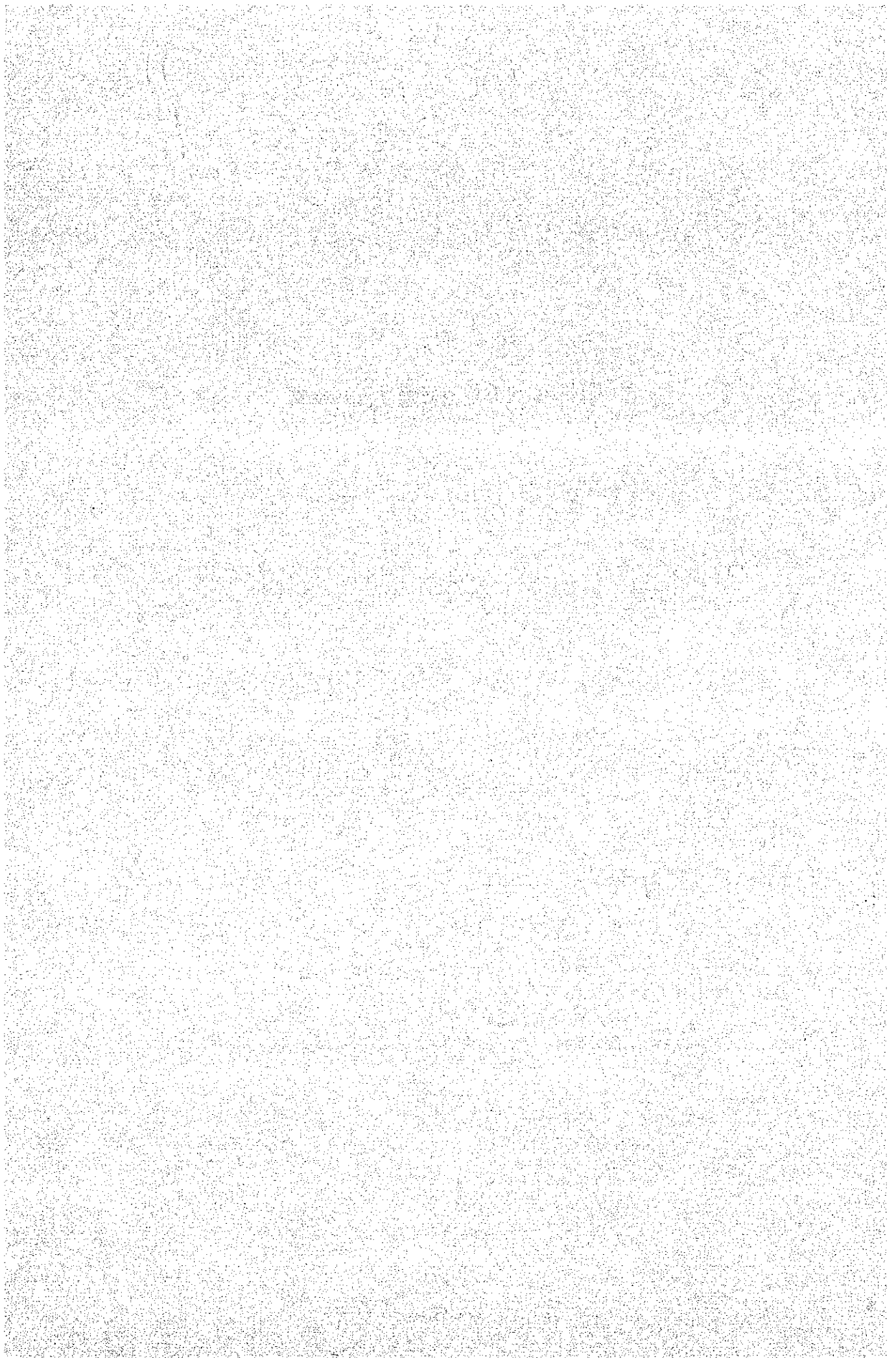
5. Establishment of National Engineering and Technology Development Service Centre for Computer-Aided-Design (CAD) and Computer-Aided-Manufacturing (CAM)

One of the objectives of PITAC is to introduce new technology in the country. This project envisages introduction of computer technology in design and manufacturing. The cost of project is esimated at Rs. 11.278 million with a foreign exchange component of Rs. 8.050 million. The duration is 24 months.

In the year 1975 PITAC sponsored a project entitled "METAL ADVISORY SERVICE" (MAS) with the assistance of UNIDO. It was initially housed in the PITAC premises. The purpose of this project was to assist the metallurgical industry by solving their technical problems. With the construction of new building at Kot Lakhpat, Lahore. MAS has been shifted and is operating independently under the name of Metal Industry Research and Development Centre (MIRDC). It is now under administrative control of the Ministry of Industries, Islamabad.

資 料 V

PITACにおける研修コース概要



PAKISTAN INDUSTRIAL TECHNICAL ASSISTANCE CENTRE

LAHORE-16

TENTATIVE TRAINING PROGRAMS FOR
COURSE NO.82

Sr. No.	Name of Fields	Weeks	COURSE NO. 82		
1	Jig & Fixture Design	10	7-10-1984 to 13-12-1984		
2	Press Tool of Mould Design	"	"		
3	Cutting Tools & Gauge Design	"	"		
4	Machine Shop Practice	"	"		
5	Precision Tool Making	"	"		
6	Air Conditioning and Refrigeration	"	"		
			<u>82/A</u>	<u>82/B</u>	
7	Pattern Making	6	7-10-84 to 15-11-84	18-11-84 to 27-12-84	
8	Basic Welding	"	"	"	
9	Basic Drafting	"	"	"	
10	Inspection & Quality Control	"	"	"	
			<u>82/1</u>	<u>82/2</u>	<u>82/3</u>
11	Heat Treatment	4	7-10-84 to 1-11-84	43-11-84 to 29-11-84	2-12-84 to 27-12-84
12	Foundry	"	"	"	"
13	Protective Coating	"	"	"	"
14	Sheet Metal & Development	"	"	"	"
15	Advance Drafting	"	"	"	"

SYLLABUS OF TRAINING COURSES

1. Jig & Fixture Design:

Introduction, Study of industrial standards, clamping, Devices, designing, Drilling jigs for various components. Fits and Tolerances, Designing Milling Fixtures, study of Tapping fixture for a component. Material specification & Heat Treatment.

2. Press Tool & Mould Design:

Introduction, study of various types of stamping tools, Designing of blanking, bending and combination tools. Preparation of assembly and detail drawings. Calculation of Die Block, Percentage wastage, press capacity requirement. Designing 2-station progressive tools & its layout introduction of plastic materials its specification and out lines & Designing (a) Injection Mould (b) Compression Moulds.

3. Cutting Tools & Gauge Design

Introduction, Study of Flat form & circular form tools. Designing flat form combined form and circular form tools for 3 different shapes, graphically and analytically. Introduction of gearing, calculation

& designing 6 D.P. & 8 D.P. milling cutters, Study of fits & tolerances & conventional inspection gauges. Designing of plug snaps, depth & taper gauges. Study of thread & designing thread plug & thread ring gauges. Material specification Heat Treatment.

4. Machine Shop Practice:

Introduction, safety care & Maintenance of Machine tools. Measuring instruments, Lathes various turning operations, Material and types of tools speeds & feed, cutting different types of threads, milling and various operations. Use of milling cutters dividing head, cutting spur Bevel, Helical and Worm Gears.

5. Precision Tool Making:

Introduction, safety, use of precision tools, study & practice of various types of Lathes, cutting various types of threads, study and practice of different types of milling machines cutting spur, bevel, helical & worm gears. Precision surface and cylindrical grinding machines. Profile & thread

grinding Machine grinding wheels and types. Use of sine bar, gear shaping and Hobbing, Lapping, Honing and use of oil stones, Jig boring & Jig Grinding.

6. Air Conditioning and Refrigeration:

Introduction to A/C and Refrigeration Basic concept of Electricity, study of different parts of Air condition & Refrigeration, Types of different compressors condensers & Evaporators. Commercial A/C conditioning, Types of methods with practicals. Practical fault finding in the different parts of A/C & Refrigeration.

7. Pattern Making:

Introduction, proper use and care of bench and Hand tools. Demonstrations of Pattern shop Machinery, Materials used, Methods of making Patterns and core boxes Pattern layout & B.P. roading exercises in Pattern Making. Basic discussions & demonstrations in Foundry work as related to Pattern Making.

8. Basic Welding:

Introduction, safety precautions
Material & equipment used, Flames and
its characters, practices for gas
welding. Use of fluxes and its
advantages, Manual/Machine. Gas
cutting. Brazing practice, electric
welding, practice on M.S. and cast
iron, cutting of Metals by Arc
selection of currents & electrodes.

9. Basic Drafting:

Introduction, drafting basic
principles, lines & orthographic
views. Drawing practice of 2/3
views & detail drawing study and
calculation of spur gears, key ways
V-belt and groove of pulley etc.
Information of Fits & Tolerances.
General discussion about initial
selection and Heat Treatment.

10. Inspection & Quality Control:

Introduction of measuring inst-
ruments & equipments, used of vern-
ier caliper micrometer. Protector
Dial indicators and gauge block
since bar, 3 wire system of checking
threads & different ways of measure-
ment, tapers, use of comparators
visual gauge, super micrometer, use
of magnaflux for crack detector and
metal monitor.

11. Heat Treatment:

Introduction, safety, various
types of Heat Treatment. Hardening,

tempering, quenching, case harden-
ing, cyaniding, annealing & nor-
malizing, different types of fur-
naces methods of hardness testing.
Alloy steels identifying steels
spark testing practice, carboriz-
ing. Heat Treatment of tool steels,
High speed steels.

12. Protective Coating:

Introduction, safety, loading/
unloading pickling tanks, through
rinsing, types of tanks required
for different kinds of plating,
solution/Acids/cathode bars mixing
chemicals as per formula instruc-
tions. Using Rheostates voltmeters
& Ammeters, Rectifiers and motor
generators instructions/practice
of copper, Nickel, Bronze, Cadmium
and Zing plating, Electro polishing
on metals.

13. Sheet Metal & Development:

Introduction, S.M. working
tools and machinery, shearing, fold-
ing various angles, Metal allowanc-
es, grooves, and Notches preparing
wired edge, soldering fluxes,
practice of soldering by various
methods, development and fabrica-
tion.

14. Foundry:

Introduction to Foundry work,
Moulding sand & its classification,
practice in sand moulding and core

Making, exercise in Lab, sand test-
ing, melting practice. Basic Found-
ry metallurgy, machine moulding,
cleaning and finishing of castings.
Casting defects and their remedies.

15. Advance Drafting:

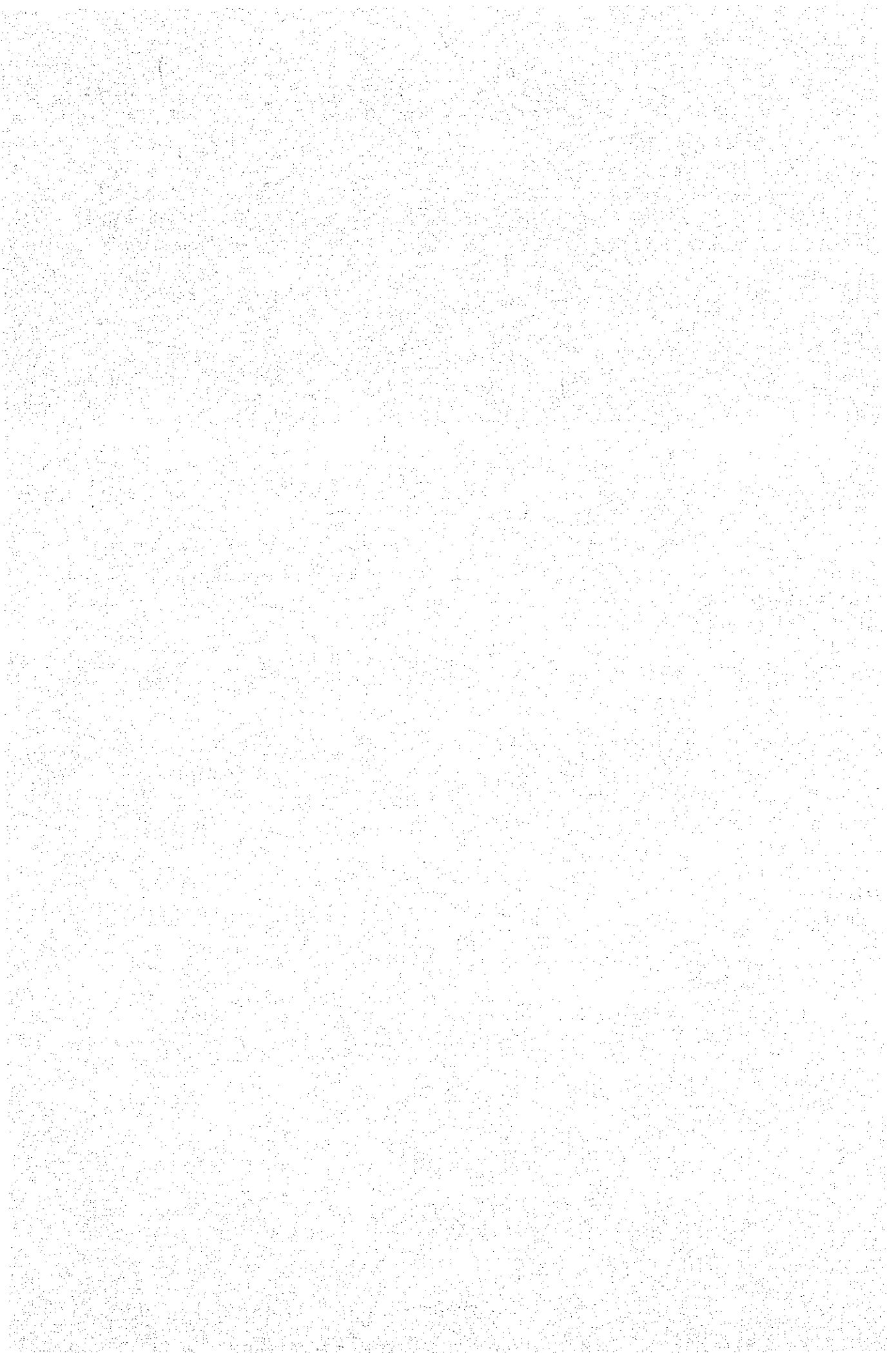
Introduction, industrial
standards projection methods,
practice of 3rd angle projection,
Assignments to draw 3 views of tube
Ranger, clamp lever friction shaft
bearing, wall bracket, step pully
etc. Fits and tolerances, Material
specification and their Heat Treat-
ment.

COURSE DURATIONS

Serial Nos.	1 to 6	= 10 weeks
"	"	7 to 10= 6 weeks
"	"	11 to 15= 4 weeks

資 料 VI

関 連 写 真



PITAC-JICA PROJECT ROOM

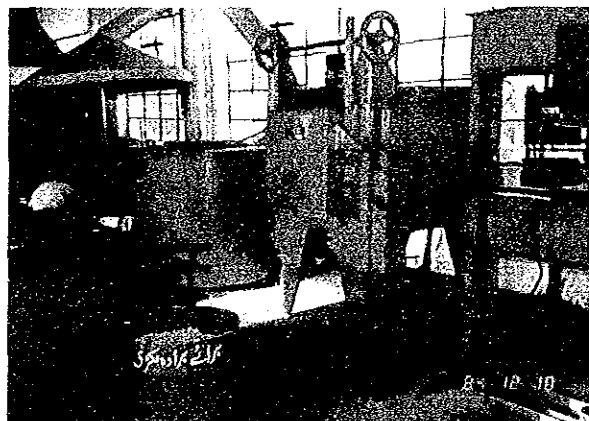


外 観



電鋸加工装置据付予定場所

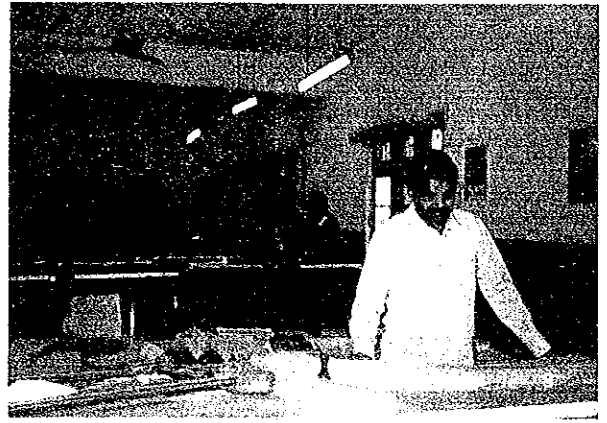
2. 熱処理部



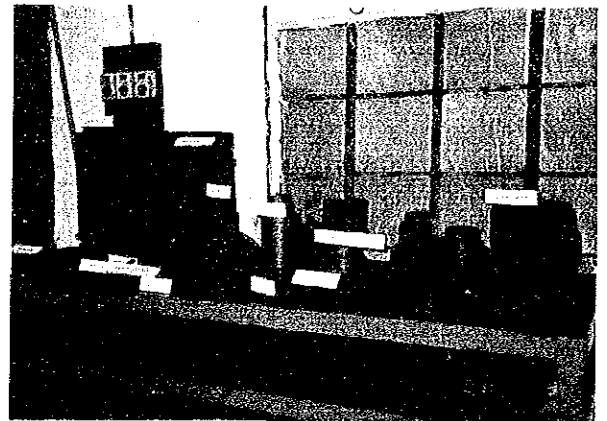
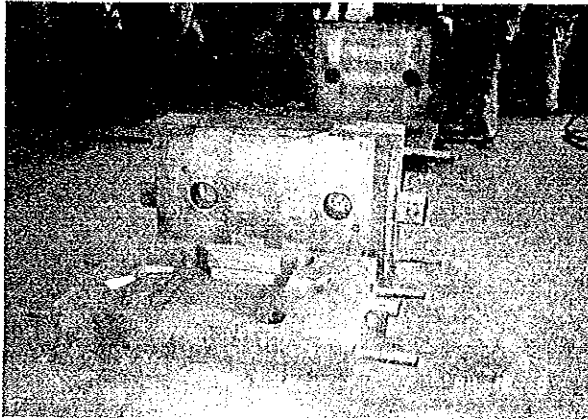
3. ワークショップ



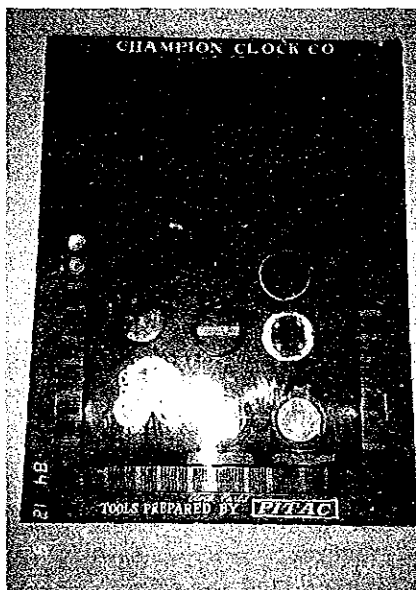
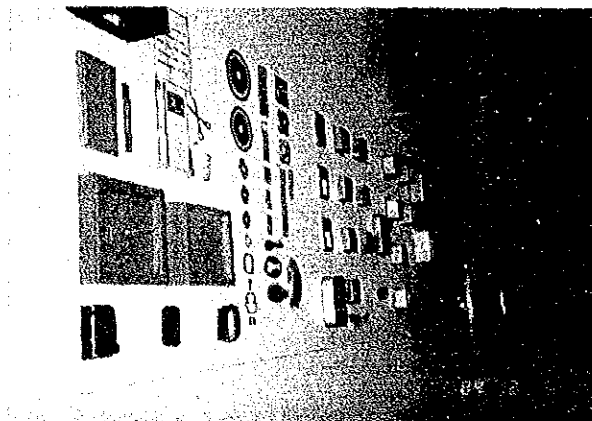
4. 設計室



5. 鋳物部



6. PITACで製作された型類



JICA