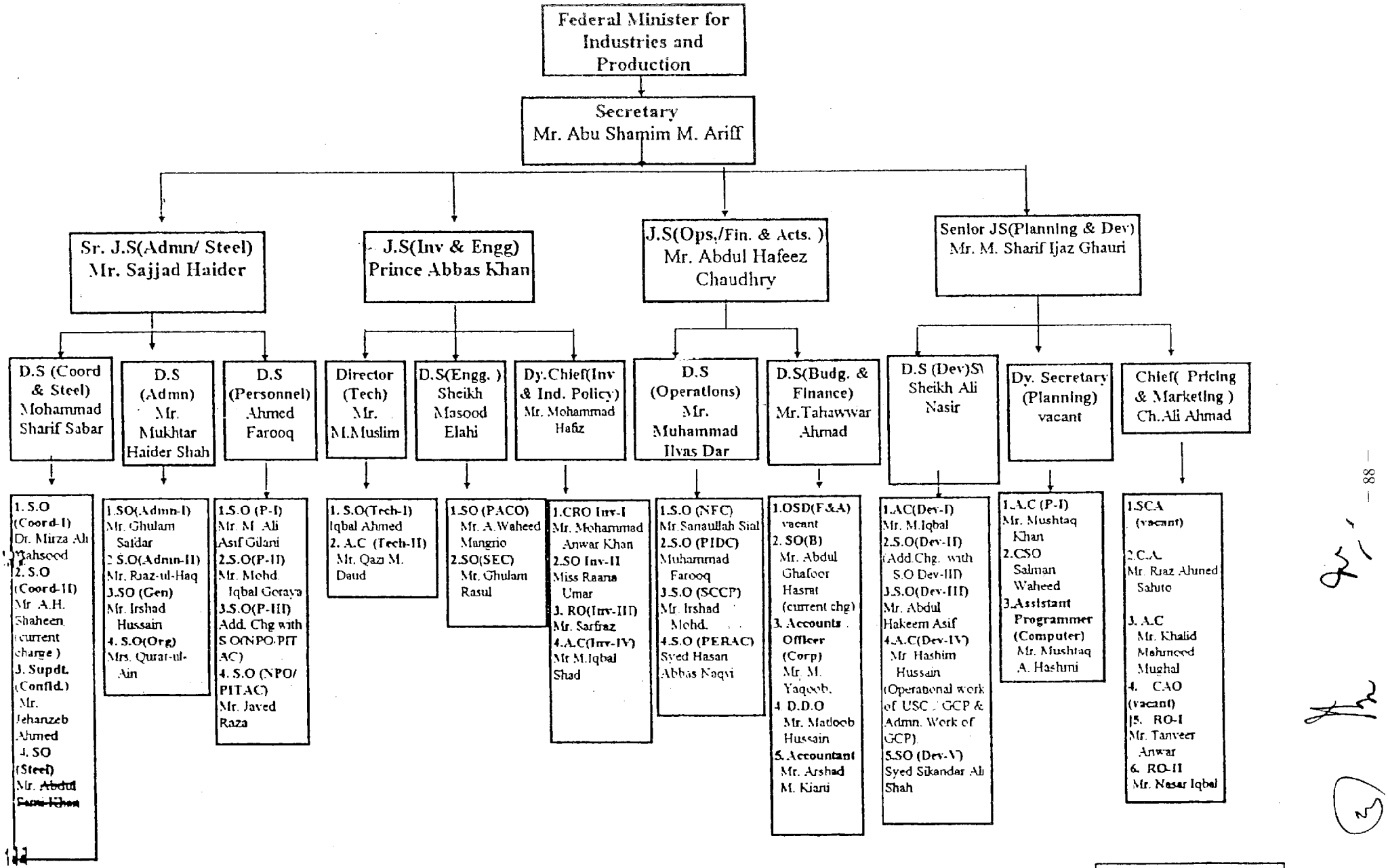
Annex 3

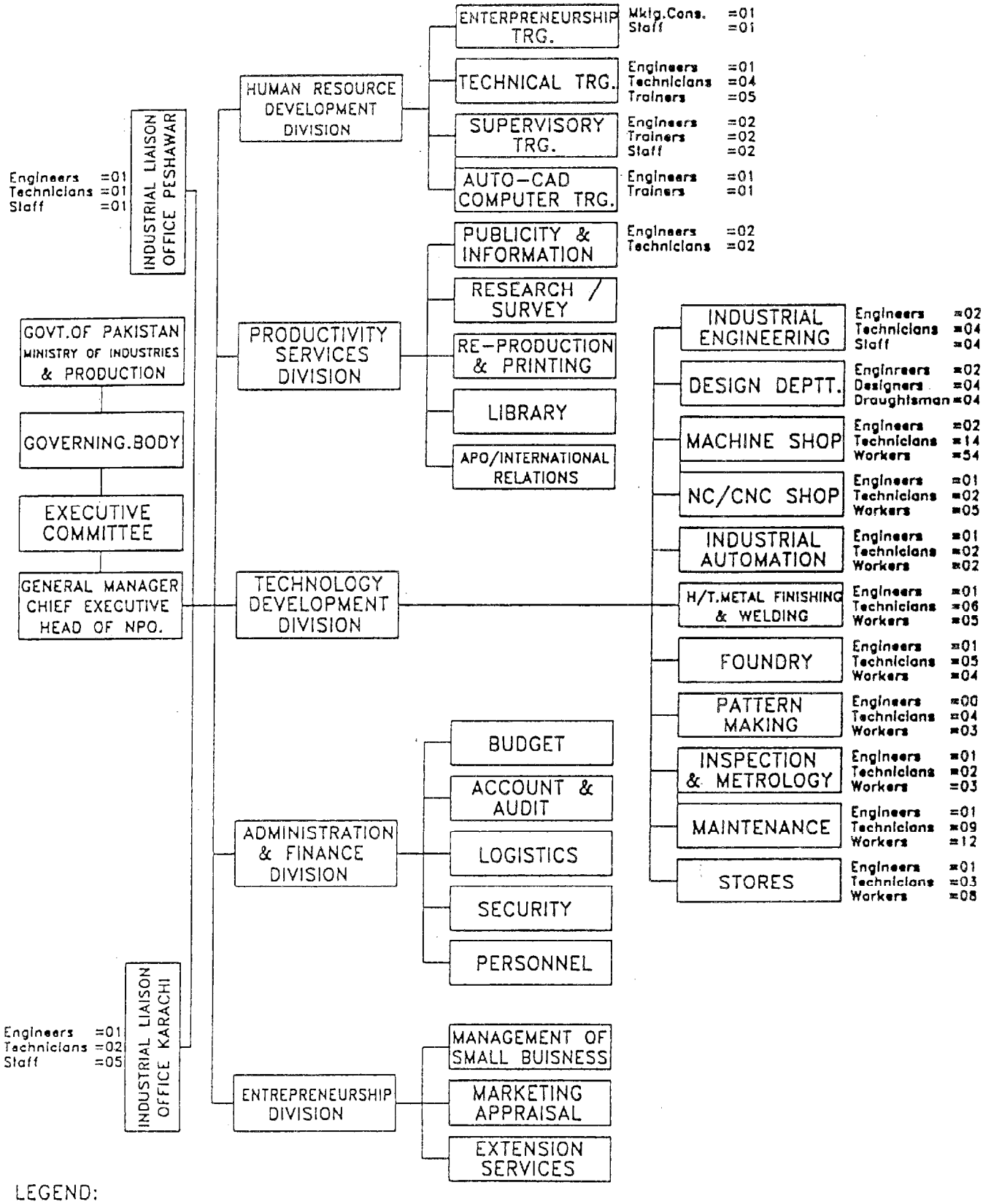
ORGANIZATIONAL CHART OF M/O INDUSTRIES AND PRODUCTION



COMPUTER CELL
M/o Ind. & Prod.
dated: 10-3-2000.

Annex 4

PITAC: ORGANISATION CHART



LEGEND:

ENGINEERS:	University Graduate in Engineering.
TECHNIACIANS:	3 Years Diploma Course from Polytechnic.
WORKERS:	Matriculate with 2 years Certificate from Vocational Training Institute.
STAFF:	Supritendent, Clerk, Typist, Office Boys, etc.

Rev:8th April,2000

Annex 5

Budget, Settlement Account, Generated Income of PITAC,1995-96

Expenditure	Estimated (A)	Actual (B)	(B)/(A)	Income	Estimated (A)	Actual (B)	(B)/(A)
Personnel Expense	31,320,000/-	31,319,722/-	100.00%	Training	1,300,000/-	1,280,255/-	98.48%
Utilities	2,364,500/-	2,364,598/-	100.00%	Advisory and Consultancy Service	100,000/-	60,027/-	60.27%
Office Consumable	477,000/-	477,176/-	100.03%	Seminars and Conference	200,000/-	190,563/-	95.28%
Furniture Fixture & Tools Equipment	483,500/-	483,574/-	100.00%	Production (Die Moulds & Services	2,700,000/-	2,808,169/-	104%
Pepair & Maint	256,000/-	255,827/-	99/93%	Misc.	50,000/-	8,180/-	16.36%
				Total Receipt	4,350,000/-	4347194/-	99.94%
Others (APO Contribution Conference, Seminar & Symposia.	3,836,000/-	3,836,297/-	100.00%	Govt. grant-in-Aid	34,390,000/-	34,390,000/-	100%
Total	38,737,000/-	38,737,194/-	100.00%	Total	38,740,000/-	38,737,194/-	99.99%
				Income/Expenditure (Actual)			100%

Budget Settlement Account, Generated Income of PITAC,1996-97

Expenditure	Estimated (A)	Actual (B)	(B)/(A)	Income	Estimated (A)	Actual (B)	(B)/(A)
Personnel Expense	33,574,324/-	33,572,426/-		Training	1,800,000/-	1,793,457/-	99.64%
Utilities	2,518,500/-	2,518,297/-		Advisory and Consultancy Service	100,000/-	88,117/-	88.12%
Office Consumable	720,000/-	719,617/-		Seminars and Conference	200,000/-	205,148/-	102.57%
Furniture & Office	652,500/-	652,623/-		Production (Die Moulds & Services	2,400,000/-	2,355,826/-	98.16%
Maintenance	781,000/-	781,485/-		Others	50,000/-	47,776/-	95.55%
				Total Receipt	4,550,000/-	4,490,324/-	98.69%
Others (APO Contribution Conference, Seminar & Symposia.	4,782,000/-	4,781,722/-		Govt. Grant-in-Aid	38,538,000/-	38,538,000/-	100.00%
Total	43,028,324/-	43,026,170/-		Total	43,088,000/-	43,028,324/-	99.88%
				Income/Expenditure (Actual)			100%

(3)

Annex

Budget, Settlement Account, Generated Income of PITAC, 1997-98

Expenditure	Estimated (A)	Actual (B)	(B)/(A)	Income	Estimated (A)	Actual (B)	(B)/(A)
Personnel Expense	33,115,000/-	33,114,661/-		Training	1,600,000/-	1,518,935/-	94.93%
Utilities	2,848,000/-	2,847,842/-		Advisory and Consultancy Service	100,000/-	110,171/-	110.17%
Office Consumable	820,500/-	820,624/-		Seminars and Conference	250,000/-	241,563/-	96.63%
Furniture & Office	333,000/-	333,008/-		Production (Die Moulds & Services	2,300,000/-	2,297,209/-	99.87%
Maintenance	586,000/-	586,231/-		Others	50,000/-	36,122/-	74.24%
				Total Receipt	4,300,000/-	4,204,000/-	97.70%
Others (APO Contribution Conference, Seminar & Symposia.	5,501,500/-	5,500,697/-		Govt. grant-in Aid	39,000,000/-	39,000,000/-	100.00%
Total	43,204,000/-	43,203,063/-		Total	43,300,000/-	43,204,000/-	99.78%
				Income/Expenditure (Actual)			100%

Budget, Settlement Account, Generated Income of PITAC, 1998-99

Expenditure	Estimated (A)	Actual (B)	(B)/(A)	Income	Estimated (A)	Actual (B)	(B)/(A)
Personnel Expense	26,751,270/-	26,749,813/-	100%	Training	1,200,000/-	1,073,939/-	89.49%
Utilities	3,031,000/-	3,031,047/-	100%	Advisory and Consultancy Service	100,000/-	78,421/-	78.42%
Office Consumable	880,500/-	881,031/-	100%	Seminars and Conference	150,000/-	140,094/-	93.40%
Furniture & Office	--	--	--	Production (Die Moulds & Services	3,100,000/-	2,721,316/-	87.78%
Maintenance	421,800/-	422,142/-	100%	Others	50,000	50,000/-	100%
				Total Receipt	4,600,000/-	4,063,770/-	88.34%
Others (APO Contribution Conference, Seminar & Symposia.	5,371,000/-	5,371,537/-	100%	Govt. grant-in Aid	32,391,800/-	32,391,800/-	100.00%
Total	36,455,570/-	36,455,570/-	100%	Total	36,991,800/-	36,455,570/-	98.55%
				Income/Expenditure (Actual)			100%

Budget, Settlement Account, Generated Income of PITAC, 1999-2000 (JUL 1999-JAN 2000)

Expenditure	Estimated (A)	Actual (B)	(B)/(A)	Income	Estimated (A)	Actual (B)	(B)/(A)
Personnel Expense	31,860,400/-	17,425,322/ -	54.69%	Training	1,000,000/-	124,850/-	12.48%
Utilities	3,105,000/-	1,782,510/-	57.50%	Advisory and Consultancy Service	100,000/-	41,227/-	41.22%
Office Consumable	911,600/-	545,899/-	59.88%	Seminars and Conference	300,000/-	139,000/-	46.33%
Furniture & Office	--	--	--	Production (Die Moulds & Services	3,550,000/-	1,485,720/-	41.85%
Maintenance	445,000/-	284,564/-	63.95%	Others	50,000/-	16,280/-	32.56%
				Total Receipt	5,000,000/-	1,807,077/-	36.14%
Others (APO' Contribution Conference, Seminar & Symposia.	6,678,000/-	155,135/-	2.32%	Govt. grant-in Aid	38,000,000/-	20,890,000/-	54.97%
Total	43,000,000/-	20,193,430/-	46.96%	Total	43,000,000/-	22,697,077/-	52.78%
				Income/Expenditure (Actual)			112.39%

Annex 6-1

Summary of PITAC's Performance

	Activities	Type	94		95		96		97		98		99	
1	Training Courses		I.C	I.P	I.C	I.P	I.C	I.P	I.C	I.P	I.C	I.P	I.C	I.P
	(1) Technical Training	course	-	17	-	19	-	15	-	19	-	23	-	25
		attendees	-	248	-	138	-	234	-	168	-	94	-	103
	(2) HRD Training	course	9	28	7	9	7	7	6	5	4	7	6	9
		attendees	118	354	290	328	150	115	130	106	70	108	100	120
	Total	course	9	45	7	28	7	22	6	24	4	30	6	34
		attendees	118	602	290	466	150	349	130	274	70	202	100	223
2	Advisory and Consultancy Services		Quantity		Quantity		Quantity		Quantity		Quantity		Quantity	
	(1) Technical Expert Services (APO)	- Mould Making - ISO 9000 - QC Techniques - Moulding	5		6		8		8		10		11	
	(2) Local Expertise and Technological Backup Support (PITAC)	- Moulds	295		379		407		429		453		467	
		- Dies/Tools	90		117		134		103		91		95	
		- Technical advices	200		225		230		201		193		225	
		- In-plant Improvement	100		97		105		92		83		97	
		- Others	110		126		106		57		95		103	
	Total		800		950		990		890		925		987	
3	Seminars and Conferences		Number	Attendees	Number	Attendees	Number	Attendees	Number	Attendees	Number	Attendees	Number	Attendees
		(a) Quality	6	60	1	435	2	493	3	547	3	473	3	535
		(b) Productivity	2	18	1	64	2	63	2	85	3	107	4	127
		(c) Technology	4	22	-	-	1	32	1	27	2	43	3	68
		(d) Others	1	19	-	-	1	9	1	13	1	29	1	37
	Total		13	119	2	499	6	597	7	672	9	652	11	767

Legend:

I.C In Company I.P In PITAC

Annex 6-2

Summary of Targets of PITAC for the Year 2000 &2001

Activities	Type	2000		2001	
1. Training Courses		I.C.	I.P.	I.C.	I.P.
(1) Technical Training .	Courses	-	40		45
	Attendees	-	395	-	425
(2) HRD Training	Courses	10	30	12	35
	Attendees	200	450	230	470
Total:	Courses	10	70	12	80
	Attendees	200	845	230	895
2. Advisory and Consultancy Services		Quality		Quality	
(1) Technical Experts Services (APO)		15		18	
(2) Local Expertise and Technological backup support		1200		1350	
Total		1215		1368	
3. Seminars and Conferences		Number of Attendees		Number of Attendees	
		800		925	

Legends:
I.C. In Company
I. P. In PITAC

Annex 6-2

Summary of Targets of PITAC for the Year 2000 &2001

Activities	Type	2000		2001	
1. Training Courses		I.C.	I.P.	I.C.	I.P.
(1) Technical Training .	Courses	-	40		45
	Attendees	-	395	-	425
(2) HRD Training	Courses	10	30	12	35
	Attendees	200	450	230	470
Total:	Courses	10	70	12	80
	Attendees	200	845	230	895
2. Advisory and Consultancy Services		Quality		Quality	
(1) Technical Experts Services (APO)		15		18	
(2) Local Expertise and Technological backup support		1200		1350	
Total		1215		1368	
3. Seminars and Conferences		Number of Attendees		Number of Attendees	
		800		925	

Legends:
I.C. In Company
I. P. In PITAC

Annex 6-3a

Training Courses of PITAC (1996)

(Technical Courses)

Training Course	Course Title	Type of Training	Duration	Attendees	Remarks
Regular Training Course	1. Machine Shop Practices	OJT	10 weeks	40	
-do-	2. Jig & Fixture Design	-do-	-do-	15	
-do-	3. Precision Die and Mould Making.	-do-	-do-	35	
-do-	4. Press Tool & Mould Design.	-do-	-do-	40	
-do-	5. Cutting Tool & Gauge Design	-do-	-do-	30	
-do-	6. Basic Drafting.	-do-	6 weeks	10	
-do-	7. Advance Drafting.	-do-	-do-	15	
-do-	8. Inspection & Quality Control	-do-	-do-	9	
-do-	9. Heat Treatment.	-do-	-do-	2	
-do-	10. Basic Pneumatics	-do-	-do-	12	
Special Training Course	11. CNC Machine Tool	-do-	2 weeks	6	
-do-	12. Tool Design	-do-	6 weeks	4	
-do-	13. Tool and Cutter Grinding.	-do-	4 weeks	6	
-do-	14. Induction Hardening Techniques	-do-	1 weeks	5	
-do-	15. Gear Cutting	-do-	2 weeks	5	
				234	

Annex

Training Courses of PITAC (1997)

(Technical Courses)

Training Course	Course Title	Type of Training	Duration	Attendees	Remarks
Regular Training Course	1. Machine Shop Pracuce.	OJT	10 weeks	8	
-do-	2. Jigs and Fixtures Design.	-do-	-do-	5	
-do-	3. Precision Die and Mould Making.	-do-	-do-	28	
-do-	4. Press Tool and Mould Design.	-do-	-do-	22	
-do-	5. Cutting Tool and Gauge Design	-do-	-do-	20	
-do-	6. Basic Drafting .	-do-	6 weeks	15	
-do-	7. Advance Drafting.	-do-	-do-	6	
-do-	8. Inspection and Quality Control	-do-	-do-	7	
-do-	9. Heat Treatment.	-do-	-do-	4	
-do-	10. Basic Pneumatics.	-do-	-do-	12	
Special Training Course	11. CNC Machine Tool	-do-	2 weeks	2	
-do-	12. Tool Design.	-do-	6 weeks	2	
-do-	13. Tool and Cutter Grinding.	-do-	4 weeks	2	
-do-	14. Induction Hardening Techniques	-do-	1 weeks	5	
-do-	15. Gear Cutting.	-do-	2 weeks	8	
-do-	16. Sheet Metal	-do-	1 weeks	-	
-do-	17. EDM Wirecut	-do-	-do-	10	
-do-	18. Spark Erosion	-do-	-do-	10	
-do-	19. CNC Milling	-do-	2 weeks	4	
				168	

Annex

Training Courses of PITAC (1998)

(Technical Courses)

Training Course	Course Title	Type of Training	Duration	Attendees	Remarks
Regular Training Course	1. Machine Shop Practice.	OJT	10 weeks	6	
-do-	2. Jigs and Fixture Design.	-do-	-do-	8	
-do-	3. Precision Die and Mould Making.	-do-	-do-	10	
-do-	4. Press Tool and Mould Design.	-do-	-do-	6	
-do-	5. Cutting Tool and Gauge Design	-do-	-do-	15	
-do-	6. Basic Drafting.	-do-	6 weeks	6	
-do-	7. Advance Drafting	-do-	-do-	4	
-do-	8. Inspection and Quality Control.	-do-	-do-	3	
-do-	9. Heat Treatment.	-do-	-do-	2	
-do-	10. Basic Pneumatics.	-do-	-do-	4	
Special Training Course	11. CNC Machine Tool.	-do-	2 weeks	2	
-do-	12. Tool Design.	-do-	6 weeks	2	
-do-	13. Tool and Cuner Grinding.	-do-	4 weeks	2	
-do-	14. Induction Hardening.	-do-	1 weeks	4	
-do-	15. Gear Cutting.	-do-	-do-	1	
-do-	16. CNC Milling.	-do-	2 weeks	6	
-do-	17. Spark Erosion.	-do-	1 weeks	2	
-do-	18. EDM Wirecut	-do-	-do-	2	
-do-	19. Profile Grinder	-do-	-do-	1	
-do-	20. Jig Grinding.	-do-	-do-	2	
-do-	21. Ultrasound Flaw Detector	-do-	-do-	2	
-do-	22. Universal Measuring Machine	-do-	-do-	2	
-do-	23. Roundness Measuring Machine	-do-	-do-	2	
				94	

Training Courses of PITAC (1999)

(Technical Courses)

Training Courses	Course Title	Type of Training	Duration	Attendees	Remarks
Regular Training Courses	1. Machine Shop Practice	OJT	10 Weeks	10	
-do-	2. Jig & Fixture Design	-do-	-do-	10	
-do-	3. Precision Die and Mould Making	-do-	-do-	21	
-do-	4. Press Tool & Mould Design	-do-	-do-	10	
-do-	5. Cutting Tool & Gauge Design	-do-	-do-	15	
-do-	6. Basic Drafting	-do-	6 Weeks	5	
-do-	7. Advanced Drafting	-do-	-do-	4	
-do-	8. Inspection & Quality Control	-do-	-do-	5	
-do-	10. Basic Pneumatics	-do-	2 Weeks	4	
Special Training Courses	11. CNC Machine Tools	-do-	6 Weeks	6	
-do-	12. Tool Design	-do-	1 Week	4	
-do-	14. Induction Hardening Technique	-do-	2 Weeks	5	
-do-	15. Gear Cutting	-do-		4	
				103	

Annex 6-3b

Training Courses of PITAC (1996)

(HRD Courses)

Training Course	Course Title	Type of Training	Duration	Attendees	Remarks
HRD Programmes	1. Supervisory Development	Seminar	1 weeks	40	
	2. Tool Engineering Techniques	-do-	10 weeks	32	
	3. Market Appraisal Techniques	-do-	10 days	30	
	4. ISO 9000	-do-	1 weeks	10	
	5. Post Harvest Technology for Vegetables	-do-	-do-	14	
	6. 7-Quality Tools for Continuous Improvement	-do-	3 days	21	
	7. Energy Management	-do-	2 weeks	20	
	8. Hand Knotted Carpet Industry	Study Mission	1 weeks	11	
	9. Quality Control Circles	Seminar	3 days	12	
	10. Tool Engineering Techniques	-do-	1 week	15	
	11. Total Quality Management	-do-	-do-	20	
	12. Problem Solving Techniques	-do-	2 days	12	
	13. How to Start Export Business	-do-	4 days	20	
	14. Energy Audit	-do-	1 day	08	
				265	

Annex

Training Courses of PITAC (1997)

(HRD Courses)

Training Course	Course Title	Type of Training	Duration	Attendees	Remarks
HRD Programmes	1. Improving Productivity, Quality, Human Resources and Entrepreneurship Development	Seminar	01 days	11	
	2. Financial Analysis				
	3. Qualified Metals Castings	-do-	10 days	18	
	4 Irrigation Associations	-do-	03 days	12	
	5. Energy Audit	-do-	06 days	32	
	6. Quality Control Circles	-do-	01 days	10	
	7 ISO 9000	-do-	03 days	12	
	8 Supervisory Development	-do-	-do-	102	
	9 Quality Tools for Continuous Improvement	-do-	-do-	12	
	10 Total Quality Management	-do-	-do-	10	
	11 Problem Solving Techniques	-do-	-do-	12	
		-do-	2 days	05	
				236	

Annex

Training Courses of PITAC (1998)

(HRD Courses)

Training Course	Course Title	Type of Training	Duration	Attendees	Remarks
HRD Programmes	1. Tool Engineering Techniques	Seminar	10 weeks	12	
	2. Total Quality Management	-do-	3 days	9	
	3. Export Capabilities of SME's	-do-	10 days	12	
	4. Problem Solving Techniques	-do-	2 days	9	
	5. How to Start Export Business	-do-	4 days	94	
	6. Degraded Soils	-do-	5 days	11	
	7 Quality Tools for Continuous Improvement	-do-	3 days	5	
	8 ISO 9000				
	9 Supervisory Development	-do-	3 days	8	
	10 Quality Control Circles	-do-	1 weeks	6	
	11. Energy Audit	-do-	3 days	6	
		-do-	1 day	6	
				178	

Course Contents of Technical Training Courses of PITAC

1. *Machine Shop Practice*

Workshop Safety Precautions, Introduction to machine & machine Tools, Types of tools, Introduction to basic workshop materials, Different types of lathe, Parts of lathe & their functions, Size of lathe, Lathe operations, Cutting different kinds of threads, Tapers & kind of tapers, Cutting speed & feed on lathe, Shaper and its parts & their functions, Operations on shaper, Cutting V-Block, Key ways & Dove Tail joint on shaper, Introduction to milling machines and different cutters used, Milling operations, Cutting of Spur, Helical & Bevel gears & Drill, Reamer and cam etc. Introduction to bench fitting, Different kinds of files & their functions, Making centre gauge, ACME gauge & Inside/Outside callipers, Introduction to various grinding machines & their operations.

2. *Precision Die and Tool Making*

Introduction, Safety, Use of Precision Tools, Study and practice of various types of Lathe, Cutting various types of Threads, Study and Practice of different types of Milling machines, Cutting Spur, Bevel, Helical and Worm Gears. Precision Surface and Cylindrical Grinding Machines, Profile and Thread Grinding Machines. Profile and Thread Grinding Machines Grinding Wheels and types. Use of Sine bar, Gear Shaping and Hobbing, Lapping, Honing and use of oil stones, Jig boring and Jig Grinding.

3. *Jig and Fixture Design*

Introduction, Economic approach to the provision of special equipment. Basic Design principles, General principles of location, Drill Bushes and Plates, Locating and Clamping Devices. Classification of Jigs for Drilling operations. Analysis and synthesis. Exercises for Designing Jigs, Fixtures, Fixtures for Milling operations. Fixture and Machine relationship, Designing of plain Milling Fixtures, String Milling Fixtures, Gauge Mill Fixtures etc. Limits, Fits and Tolerance, types of screw thread and their applications, types of Gears, Gear Material, application and calculations for Spur Gear. Heat Treatment Processes i.e. Annealing, Normalizing, Hardening, Tempering etc.

4. *Press Tools and Mould Design*

Introduction to Die Design, Blank and Blanking Die, Steps to Design a Die. Layout a scrap strip. Design of the parts as follow Die Block, Punches, Punch Plate, Finger Stoppers, Automatic Stopper, Stripper, Selection of Die set, how to apply fasteners. Types of Dies. Piercing, Blanking, Multi Station Progressive Die, Bending, Notching, Drawing, Forming, Compound, Combination Curling, Trimming. Introduction of Moulds. Steps to Design a Mould. Design principles in part design. General construction and type of Moulds. Runner and Spur Design. Cooling System. Ejection System, Shrinkage, Feed System, Venting.

5. *Cutting Tool and Gauge Design*

Introduction, Basic Trigonometry and Exercises, Study of Flat Form and Circular Form Tools. Tool signatures, recommended angles for High Speed Steel (HSS) for cutting different materials. Designing Flat Form Tool and Circular Form Tool for 3-different shapes, graphically and analytically. Introduction of Gearing. Calculations and Designing 6 DP and 8 DP Milling Cutters. Study of Broaching and Broach Designing. Designing of standard cutting tools as twist drills, Milling cutters, Reamers etc. Study of Fits and Tolerances and Conventional Inspection Gauges. Designing of Plug, Snap,

Depth and Taper Gauges and special Gauges as per requirement. Study of Threads and Designing Thread, Plug and Thread Ring Gauges. Material Specification. Heat Treatment Process and Surface Finish required for Gauges.

6. *Basic Drafting*

Introduction, Basic Drafting Principles, Type of lines and their application, Orthographic Projection System. Isometric and oblique views. Auxiliary views, Sectional Views, Drawing Practice of 2/3 views, Limits, Fits and Tolerance, types of screw threads and their applications. Types of gears, Gear Material. Engineering Materials (Steel - Plain Carbon Steel and alloy Steels). Brass, Bronze, Plastics, Definition of Heat Treatment. Heat Treatment Processes i.e. Annealing, Normalizing, Hardening and Tempering.

7. *Advanced Drafting*

Introduction, Orthographic Projection system. 1st, 2nd, 3rd and 4th angle projection system. Rejection of 2nd and 4th. 1st and 3rd angles as Industrial standards. Review of Isometric, Obliquish, Sectional and Auxiliary views. Limit, Fits and Tolerance and its application. Types of view threads and their use. Gears, Gear Material and calculations for Spur Gear. Practice of making Orthographic views from Isometric views and from machine components. Practice of making Isometric views from Orthographic views. Heat Treatment processes i.e. Annealing, Normalizing, Hardening, Case Hardening processes. Introduction of Hardening, Tempering etc.

8. *Inspection and Quality Control*

Introduction of measuring instruments and equipment, use of Vernier Calliper, Micrometer, Protector, Dial Indicators and Gauge Block, Sinebar, Wire System of Checking threads different ways of measurement, Tapers, Use of comparators, Visual Gauges, Supper Micrometer, Use of Magnaflux, for crack detector and metal monitor. Gear Checking operation of universal length measuring and Ultrasonic flaw detector and Roundness measuring Machine. Proper use of Electronic Comparator and Production Gauges.

9. *Heat Treatment Techniques*

Introduction, Safety, Various types of Heat Treatment, Hardening, Tempering, Quenching, Case Hardening, Cyaniding, Annealing and Normalizing different Steel. Alloy Steel, Identifying Steels, Spark Testing Practice, Carburizing, Heat Treatment of Tool Steels, High Speed Steels.

10. *Basic Pneumatic Course*

Introduction, Compressed Air Production and Distribution. Symbols of Pneumatic components and operational principle. Construction of Pneumatic Valves and Cylinders etc. Exercises on Pneumatic Circuits using Valves and Cylinders. Practical application of Pneumatic to different manufacturing problems and Laboratory Practice. Electro Pneumatics. Introduction and conversion of Pneumatic circuits to Electro Pneumatics.

11. *Pattern Making*

Introduction and proper use and care of bench and hand tools, demonstration of Pattern shop Machinery. Machinery Used, Blue Print Reading exercises in Pattern Making. Layout of Pattern, Methods of making. Split and Match Plate Gated Pattern. Basic Discussion and Demonstration in Foundry work as related to Pattern Making.

12. *Basic Foundry Practice*

Introduction to Foundry Work, Moulding Sand and its classification practice in Sand Moulding and Core making exercise and testing, Melting practice. Basic Foundry Metallurgy, Machine Moulding, Cleaning and Finishing of Castings. Casting defects and their remedies.

13. *Basic Welding Processes*

Introduction, Safety precautions, Material and equipment used and its characters, practice in Gas and Electric Welding on square Butt Welding Corner Weld. Fillet Weld, Pipe Butt Weld, Branch Pipe Weld. Single V Butt Weld and Cast Iron Weld. Gas Cutting, Brazing practice selection of current and Electrode for Electric Welding.

14. *Basic Course on Mould Making*

The Course is designed, particularly for Workers in the field of Mould Making. The participants of the course are equipped with fundamental techniques involved in this field. Various Machining, Finishing and Assembling Operations are learnt and practiced by the participants

15. *Mould Making for Technicians and Supervisors.*

The course contents include reading and understanding of assembly/part drawings for mould making. Selection of processes/operations for making precision cores and cavities. Assembling Operation and Tools equipment required by a die fitter are learnt and used. Basic introduction to moulding process and clamping of mould on the moulding machine is taught. Inspection of the moulded plastic parts, various defects of plastic parts and their remedies are also learnt.

Annex 7

Machinery and Equipment at PITAC

(As on 8th April, 2000)

Sr. No	Field	Name	Specification & Size	Provided by	Date of Installation	Operation	Maintenance
01	Machine Shop	Capstan lathe	400/400 V, 3 Phase 50 Cycle.	Polish	30-2068	B	A
02	-do-	Centreless Grinding Machine	Type SBA, 75 400/440 V, 3 Phase 50 Cycle	-do-	29-02-68	B	A
03	-do-	Universal Grinding Machine	Model No. M 131/W/1000/460 V. 3 Phase 50 cycle	-do-	-do-	A	A
04	-do-	Horizontal Spindle Tool Room Surface Grinding Machine	Model 540 PI	England	-do-	A	B
05	-do-	Optical Profile Grinding Machine	400-V Phase, 50 Cycle Complete Wath 5011 & 2001 Pamographs	-do-	-do-	B	A
06	-do-	Universal Lapping Machine, Micro Lap	Model UL-1 W/std Accessories 380/400V.3 phaswe 50 cycle.	Germany	-do-	A	A
07	-do-	Universal Tool & Cutter Grinding Machine	Model-6025 W/Special equipment	China	28-03-68	A	A
08	-do-	Tool Room, Lathe Machine	Model 11462 N400 400/440, 50 Cycle Phase	Russian	20-06-68	A	B
09	-do-	Horizontal Boring & Milling Machine	Type CNC-80 400/440 V, 3 Phase,. 50	Polish	10-08-68	B	A
10	-do-	Hyprofile Universal Hydraulic Duplicating Attachment		England	-do-	B	B
11	-do-	Lathe Machine	Model 1811 W/std accessories	Russian	19-10-68	A	A
12	-do-	Moulding Machine Combined Job Squeeze	Pin Lift Type Flki 108	Polish	07-06-69	A	B
13	-do-	Horizontal Surface Grinding Machine	Model Ph-3000/1000/440 V, 50 Cycle	CZECH	09.,06.69	B	B
14	-do-	Universal Tool & Cutter Grinder	Type NUA 25 400/440 V, 3 Phase 50 Cycle	Polish	16.06.69	B	B
15	-do-	Saw Sharpening Machine	415 V, 50 Cycle 3 Phase	CZECH	-do-	B	B
16	-do-	Thread Rolling Machine	Model Z-28-33 420 V 3 Phase	China	-do-	B	B
17	-do-	Universal Milling Machine	Model 57-3	China	23-10-69	A	A
18	-do-	Hacksaw Machine	Model HS-160	PAK	13-08-89	B	B
19	-do-	Surface Grinding Machine	Model 3 G-71 630x20x320 mm	Russian	30-10-69	B	B

Machinery and Equipment at PITAC (Continued....)

(As on 8th April, 2000)

20	-do-	Pentograph, Two Dimensional Engraving Machine	Model 6A 463	Russian	-do-	A	A
21	-do-	Universal Milling Machine	Model 63 - W	China	-do-	A	A
22	-do-	Lathe Turner Caspian	Mode R-12	CZECH	29.06.70	A	B
23	-do-	Profile Projector (Micrometer)	Model P-600A W/600 mm dia vertical Screen 270 V. Single Phase 50 Cycle	Italian	30.06.70	A	A
24	-do-	Gestetner Duplicating Machine	Model 470 Electrically Operated 220 V	Germany	25.05.72	A	A
25	-do-	Heavy Duty Hydraulic Copying Shapper	Type GH 560 380/660 V	Hungry	23.08.22	A	A
26	-do-	Hydraulic Board		Danish	20.03.73	B	A
27	-do-	Hydraulic Power UBR		Danish	do	B	B
28	-do-	Pneumatic Board Double		Danish	20.03.73	A	A
29	-do-	Air Compressor	Model 1970, 220 V, 431461-02 (10 ato)	Danish	-do-	A	A
30	-do-	Welding Plant	EPL - 4 ELP-14	PAK	16-10-73	B	A
31	-do-	Horizontal Milling Machine	Model FA4 All 415 V. 50 Cycle 3 Phase	CZECH	04.04.74	B	B
32	-do-	Drafting Machine	Kse 30 Paragon No.60-DO10	USA	16.11.74	A	A
33	-do-	Lathe, PECO Made	Model BL-115 SR No.5815	PAK	28.04.77	A	A
34	-do-	Lathe, PECO Made	Model BE-365 Size 3	PAK	08.0.77	A	A
35	-do-	Stencil Cutting Machine	Gestofax Model 4445	Japan	30.04.81	A	A
36	-do-	Lathe Machine	PECO Model CL-160 Sr.No.7142	PAK	15.09.81	B	A
37	-do-	Hydraulic Trolley	10 Ton Capacity Type NS 6-10	Japan	30.06.81	B	B
38	-do-	Optical Projection Profile Grinding Machine	Model GLS-130A	Japan	28.06.84	A	A
39	-do-	CNC Turning Centre (Lathe Machine)	Hitachi Seki Model 4 NEB-680 (Fanuc)	Japan	-do-	B	C
40	-do-	Hardness Testing Machine	No.2000, Vicker Pyramie W/One Transformer Single Phase 50 cycle	England	29.04.86	A	A
41	-do-	Vicker Pyramid Hardness Testing Machine, No.2001		England	29.04.86	B	A

Machinery and Equipment at PITAC (Continued....)

(As on 8th April, 2000)

42	-do-	Tool & Cutter Grinder	For Tungsten Carbide Tools Model Waida DW 313	Japan	31.05.,86	B	A
43	-do-	Plain Paper Copier	RICOH FT-3050	Japan	-do-	A	A
44	-do-	Heavy Duty Precision Engine Lathe	Model TAL600	Japan	-do-	A	A
45	-do-	Gesternor Duplicating Machine	Model 4110 220-240 V	Germany	09.06.87	B	B
46	-do-	Air Compressor, Heavy Duty	2 State Motor 10 HP 1050 RPM Displacement 40 CFM/Mnb Pressure 150 LB. Tank Size 250 LTR.	USA	12.03.88	A	A
47	-do-	Tapper Turning attachment for Lathe Machine	Model BE 165FIII Motor 2 HP , 4 pole	Pak		A	A
48	-do-	Ammonia Printing Machine (Dry Developing)	Model Dia Zil Dart XI-120 Printing size 48" variable speed upto 21 ft. p minute 220/240-V, Sr. No.144452, Model 6051	USA	27.04.90	A	B
49	-do-	Lathe Machine (Prima made)	Model PL-165 (41/2 F1) W/accessories	PAK	1.09.91	A	A
50	-do-	Hand Injection Moulding Machine		PAK	01.09.91	A	A
51	-do-	Drafting Machine, Trace type		Japan	24.10.91	A	B
52	-do-	Grind All Fixture No.1		USA	15.01.92	A	A
53	-do-	Plain Paper Copier (Toshiba)	220 V, 50-6 HZ 1.5 K.W. Sr.No.DB40622 Model BD -5120	Japan	22.06.95	A	B
54	-do-	Plain Paper Copier (Toshiba)	220 V. 50-60 HZ 1.5 KW Sr No. XE 135479 Model) BD 4910	Japan		B	A
55	-do-	Bridgeport Milling Machine (4 Nos)	Sr. No.J-22789	USA	1957	A	B
56	do	Hydraulic Copy Milling Machine	Bridgeport	USA	1958	A	B
57	-do-	Jig Boring Machine (2 Nos)	Moore	USA	1957	A	A
58	-do-	Heavy Duty Jig Borer	Milwaki	USA	1957	A	A
59	-do-	Jig Grinder (2 Nos)	Moore	USA	1957	A	A
60	-do-	Cylindrical Grinding Machine (2 Nos)	John & Shipman	USA	1957	A	A
61	-do-	Hamilton Universal Gear hobbing Machine No.1	Babar & Colman Sr. No. 3398	USA	1961	B	A
62	-do-	Surface Grinding Machine(Tool Room) 2Nos.	John & Shipman	USA	1957	A	A

Machinery and Equipment at PITAC (Continued....)

(As on 8th April, 2000)

63	-do-	Surface Grinding Machine(Tool Room) 2Nos.	Brown & Sharp	England	1957	A	A
64	-do-	Planner 36"x10"	Open End'Chipmaster S.No.600-14-56	USA	1957	B	A
65	-do-	Norton Cylindrcial Grinder 6'x3'	Norton	USA	1957	A	A
66.	-so-	Radil Drilling Machine	Gilbert, Lot-12 Sr, No.4A1010	USA	1957	A	A
67	-d0-	DoAll Bond Saw Machine	Sr. No.5821-338	USA	1956	C	B
68	-do-	Turret Lathe machine	Gisholt Sr. No.2050-14	USA	1957	B.	B
69	-do-	Shapper	DECO, SH 460	Pak	1959	A	A
70	-do-	Power Press 90 tons.	Sr. No.8102	USA	1956	B	B
71	-do-	Power Press 35 tons.	Sr. No.II-46292	USA	1956	B	B
72	-do-	Power Press 27 tons.	Sr. No. 35143	USA	1956	B	B
73	NC Shop	CNC Milling Machine	Model Makino XE 55	Japan	29.06.95	A	A
74	-do-	Air Compressor (PUMA)		Pak	16.06.96	A	A
75	-do-	EDM Wire Cut Machine	Model Japax LU3B	Japan	1984	A	B
76	-do-	EDM Spark Erosion Machine	Model Japax DP20	-do-	-do-	A	A
77	-do-	NC Copy Milling Machine	Model Makino AGH-UX85	-do-	-do-	A	B
78	-do-	Optical Profile Grinder	Model Wastno GI.S-130	-do-	1983	A	A
79	-do-	Electro Forming Machine	Model HEF50	-do-	1984	B	A

Operations
A = Operated many times
B = Operated a few time
C = Almost not operated

Maintenance
A = Good
B = Necessary to repair (operated now)
C = Necessary to repair (not operated now)

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Annex 8

Impact of JICA Phase-I Project

I. Technological Back up Support Services: Some Typical Examples

S. No	Job No.	Description	Date	Customer
1	24046	Spark Erosion of Mould Insert for I.V drip Mould	4-1-95	M/s. Medi Pak (Pvt) Ltd. Lahore
2	24135	Wire Cutting of Purches, Electrodes and dies for automatic parts	6-2-95	M/s. Tele Tronic Industry Lahore
3.	24169	Spark Erosion of Plungers lock set	20-2-95	M/s. Regal Ceramics Gujranwala.
4.	24195	Wire Cutting of Punch	7-3-95	M/s. Pakistan Card Clothing Co. Muslim Town Lahore
5.	24225	Wire Cutting of die for medicinal tablet making machine	21-3-95	M/s Stand Pharm Pakistan (Pvt) Ltd. Lahore.
6	24226	Spark Erosion of Mould Insert for Auto Cable Clips.	21-3-1995	M/s. Haji Rehman Lahore
7	24227	Spark Erosion of Mould Insert for I.V. drip mould	20-3-1995	M/s. Medi Pak (Pvt) Ltd Lahore.
8	24231	Spark erosion of mould plates	26-3-95	M/s. Thermsole Industry, Lahore
9	24234	Wire Cutting of Punch for shaving blade die	26-3-95	M/s Treet Corporation Lahore.
10	24236	Wire Cutting of Punches.	26-3-95	M/s Pakistan Card Clothing Co. Lahore.
11	24331	Form Grinding of Special from tool for lathe on Optical profile Grinding M/C.	27-4-95	M/s Thermosale Indury Lahore
12	24336	Wire cutting of Dies for Tablets Making Machine.	30-4-95	M/s. Wil Shire Labs (Pvt.) Lahore CNC.
13	24369	Wire Cutting of cavities in die plate	21-5-1995	M/s. H.M. Engg. Lahore.
14	24385	Form Grinding of Shoe Lace Cutter ends	24-5-95	M/s. Globe Lace Mills Lahore.
15.	22419	Wire Cutting of die Part	18-6-95	Mr. Naeem Khan Lahore.
16	24429	Wire Cutting of die plate	14-6-95	M/s. Farm Equipment(pvt)Ltd Lahore.
17	24435	Form Grinding of Cane	15-6-95	M/s. Thermosale Ind. Lahore
18	24458	Form Grinding of Snap Gauges	21-6-95	M/s. M.M. Engg. lahore
19	24474	Spark Erosion of Cavity of Mould	26-6-95	M/s. Thermosale Ind. Lahore.
20	24480	Spark Errosion of Cavity of Mould	28-6-95	M/s. M.M. Engg. Lahore.
21	24525	Form Grinding of Tool bits for glass bottle neck	12-7-95	M/s. Meeas Engg (Pvt) Ltd. Lahore
22	24531	Boring of holes in Jig plate by maintaining Co-ordinates on copy Milling.	13-7-95	M/s. Iqbal Brothers Engg. Faisal Abad.
23	24551	Form Grinding of Tool bit for Lathe M/C	20-7-95	-do-
24	24558	Wire cutting of Cavity of die Plate	24-7-95	Mohammad Riaz, Okara
25	24591	Forming of threads by Profile Grinder on Crusher of thread Grinding Machine	6-8-95	M/s. Spining Machinery Co Lahore.
26	24605	Boring of special holes by maintaining Co-ordinates on N/C Copy milling for	16-8-95	M/s Iqbal Brothers Faisalabad.

		drilling Jig Plates		
27	24605	do	do	do
28	24606	do	do	do
29	24207	do	do	do
30	24608	do	do	do
31	24609	do	do	do
32	24510	do	do	do
33	24615	Spark Erosion of Die Part of drip Chamber die	20-8-95	M/s. Medi pak Ltd Lahore.
34	24636	Spark Erosion of die Plate	28-8-95	M/s PECS Ind Lahore
35	24660	Spark Erosion of Cavity in mould Plate	7-9-95	do
36	24687	Special Form Grinding of tool bit on Optical Profile Grinding	18-9-95	M/s. Iqbal Brothers Faisalabad.
37	24693	do	21-9-95	M/s. Mecas Enggs Lahore
38	24700	do	25-9-95	M/s. Iqbal Brothers Faisalabad
39	24705	Spark erosion of Cavity in Mould Plate	26-9-95	M/s. PECS Ind Lahore.
40	24768	do	17-10-95	do
41	24770	Wire Cutting of Carbide dies for extrusion of Aluminimu Channel	18-10-95	Mr. Ashique Hussain Yousafi Lahore.
42	24784	do	23-10-95	do
43	24793	do	25-10-95	Mr. Ashique Hussain Yousafi Lahore
44	24796	Spark Erosion of punches for making special form	26-1-95	M/s. PECS Ind Lahore.
45	24811	Spark Erosion of Cavity in Die Plate	30-10-95	do
46.	24820	do	6-11-95	do
47	24831	Form Grinding of Tool bit for making thread on mould of glass bottle neck	8-11-95	M/s Mecas Engg. lahore.
48	24874	Forming of teeth on H.S.S. blade by Opitical Profile Grinder	28-11-95	M/s. Al-Shaukat Engg Lahore
49	24920	Form Grinding of Tool Bit for making special form on mould	19-12-95	M/s. Long Ford Engg. Lahore
50	24926	Special Forming of roller for making cup of shock absorber of Motor cycle	20-12-95	M/s. Atlas Hond Ltd Sheikhupura
51	24934	Wire Cutting of Cabride dies for extrusion of bend of optical Frame	28-12-99	M/s. Ashique Hussain Lahore.
52	24983	Form Grinding of Tool bit	21-1-95	M/s. Long Ford Engg. Lahore.
53	24298	Spark erosion of Cavity on cores of Plastice Injection Moulds	30-1-96	M/s. Plastic Packaging Industries Ltd. HUB Baluchistan.
54	25014	Spark erosion of plate of mould Auto parts	7-2-96	M/s. PECS, Industries Lahore
55	25016	Spark erosion of Cavity and core of Mould of drip chamber	8-2-96	M/s. Medi Pak Ltd Lahore
56	25042	Form Grinding of Tool bit for making thread on bottle neck mould	29-2-96	M/s. Mecas Engg (pvt) Ltd. Lahore.
57	25050	Wire Cutting of Cavity of extrusion die	3-3-96	M/s. Rehman Industry Gujranwala
58	25133	Spark Erosion of Cavity of mould plate for Auto parts	31-3-96	M/s. PECS, Inds Lahore.
59	25147	Spark Erosion of Core pin of injection mould of Auto parts	7-4-96	do

60	25153	Wire Cutting of notch punches	9-4-96	M/s. Pskistan Card Clothing Lahore
61	25184	Forming of end of punches for shoe lace cutting	14-4-96	Pak Tape tentile factory, Lahore
62	25171	Form grinding of tool bit for making threads on bottle neck mould	16-4-96	M/s. Meeas Engg. Lahore
63	25172	Wire cutting of polar cup base die	16-4-96	M/s. Packages Ltd. Lahore
64	25181	Form Grinding of roller on Opitcal Profile Grinder	18-4-96	M/s. Spindle Craft Ltd. Lahore
65	25189	Spark Erosion of Die Plate for auto part mould	21-4-96	M/s. PECS Ind. Lahore.
66	25209	do	16-5-96	do
67	25249	do	16-5-95	do
68	25289	do	5-6-96	do
69	25305	Spark Erosion of Cavities of Mould for auto part	12-6-96	M/s. S.A. Engg Lahore.
70	25313	Spark erosion of die Plate for auto part mould	17-6-96	M/s PECS Ind. Lahore.
71	25314	Wire Cutting of male die for base of paper cup	17-6-96	M/s. Packaged Ltd. lahore.
72	25349	Wire Cutting of Embroidry M/C Part	2-7-96	M/s Bashir Ahmad Lahore.
73	25353	Spark erosion of Dies for Plastic parts	2-7-96	M/s.Seroz Ltd Gujranwala
74	25355	Form Grinding of tool bit for making serration of ratchat cutter of Surgical Sessiors	2-7-96	M/s. Allam Surgical Sialkot
75	25393	Spark Erosion and wire cutting of Cavities of Mould for auto part	8-7-96	M/s. PECS Ind Lahore.
76	25409	Wire Cutting and Spark erosion of punches of electric circuit looard	28-7-96	do
77	25410	do	do	do
78	25411	do	do	do
79	25412	do	do	do
80	25413	do	do	do
81	25414	do	do	do
82	25415	do	do	do
83	25423	Wire Cutting and Spark erosion of male and Female Punches	31-7-96	M/s. Pakistan Card Clothing Co. Lahore.
84	25435	Spark erosion of Cavity of Mould Plate for auto part	5-8-96	M/s. PECS Industries Lahore
85	25443	Wire Cutting of die and Punches for Textile Machine	6-8-96	M/s. Pakistan Card Clothing Co. Lahore.
86	25444	Spark erosion of die for disco chain making Machine	6-8-96	M/s. Shalimar Chains International Lahore.
87	25476	Wire Cutting of die and Punch	20-8-96	M/s. Farm Equipment (Pvt) Ltd. Lahore.
88	25535	Spark erosion of Cavity of injection mould for handle of spry Gun	18-9-96	M/s. National Trading Co. Karachi.
89	25536	Spark erosion of Cavity of injection mould for body of spry Gun	23-9-96	do
90	25552	Spark erosion of upper part of I.V drip mould	30-9-96	M/s. Medi Pak Ltd Lahore

(3)

91	25587	Wire Cutting of Cavity of Medicine / tablet die	14-10-96	M/s. Stand Pharm Pakistan (Pvt) Ltd. Lahore.
92	25588	Copy Milling of die Plate	14-10-1996	M/s. Plasti Craft Lahore.
93	25590	Wire Cutting of Extrusion die	14-10-96	M/s. Shama Wire Cables Lahore
94	25591	Making special holes in Jig Plate for Tractor Part by maintaining Co-ordinates	14-10-96	M/s. Iqbal Brothers Faisalabad
95	25592	do	do	do
96	25593	do	do	do
97	25594	do	do	do
98	25595	do	do	do
99	25596	do	do	do
100	25599	Spark erosion of part of mould for reflector	15-1-96	M/s. Mechano Engg. Lahore
101	25657	Wire Cutting and Spark Erosion of Carbide tip	11-11-96	M/s Breeze Ind Lahore
102	25679	Wire Cutting and Spark Erision of Punches for auto part mould	20-11-96	M/s. PECS Ind Lahore
103	25680	do	do	do
104	25680	do	do	do
105	25682	do	do	do
106	25683	Form Grinding of Tool bit for making threads on bottle and mould	20-11-96	M/s.Mecas Engg. Lahore.
107	25755	Wire Cutting of Punches	11-12-96	M/s. PECS Ind Lahore.
108	25834	Form Grinding of Tool bit for mould of bottle neck	30-1-97	M/s. Ravi Glass Ltd Lahore
109	25851	Spark erosion of injection mould core	15-2-98	M/s. Medi Pak Ltd
110	25881	Form Grinding on roller	26-2-97	M/s. Spindle Craft Lahore
111	2586	Wire Cutting of die Plate and Punches for auto part mould	28-2-97	M/s. PECS Ind Lahore
112	25889	do	1-3-97	do
113	25919	Making Slot by grinding of mould core pin	15-3-97	M/s. Medi Pak Lahore
114	25939	Spark Erosion of injection point in mould insert	21-3-97	do
115	25951	Form Grinding of tool bit for making threads on bettle neck mould	28-3-97	M/s Ravi Glass Ltd Lahore.
116	25955	do	1-4-97	M/s. Mecas Engg. Lahore
117	25977	Wire Cutting of slot in jewellary tools	9-4-97	M/s. Pak Chains Lahore
118	26000	Wire cutting of punch for vehicle door part	23-4-97	M/s. H.M. Engg. Lahore
119	26023	Profile Grinding of roller for making cup of shock absorber	30-4-97	M/s. Atlas Honda Ltd. Sheikhupura
120	26034	Form grinding of tool bit for making threads on bottle neck mould		M/s Ravi Glass Ltd. Lahore
121	26045	For Grinding of tool bit for thread of bottle neck mould	13-5-97	M/s. Ahmad Mould & Engg. Lahore
122	26058	Making slot by profile grinding	16-5-97	M/s. Medi Pak Ltd Lahore.
123	26068	Wire Cutting of profile on tool for making ratched cutter of Surgical scerions	2-6-97	M/s. Shaheen Cutter Industries Sialkot.

(3)

124	26104	Spark erosier of Mould Plate for auto parts	7/6/97	M/s. PECS Ind Lahore.
125	26105	Wire Cutting of die and Punches for auto parts	17-6-97	do
126	226168	Milling of ratchet part of milk plant	7-7-97	M/s. Faizen Technical Association
127	26171	Wire Cutting of dies for plastics parts	8-7-97	M/s. PECS Ind Lahore.
128	26189	Wire Cutting of Carbide dies	22-7-97	M/s. Thermosole Ind. Lahore.
129	26192	Spark Erosion of Cavity in Die Plate	24-7-97	M/s. Aafaq Corp Lahore.
130	26220	Wire Cutting of Die	5-8-97	M/s. Thermosole Ind. Lahore.
131	26228	Spark Erosion of Cavity in mould Plate	7-8-97	M/s. Plastic Craft Lahore.
132	26239	Copy milling of outer contour of Cam	15-8-97	M/s. Mepro Engg Lahore.
133	26256	Spark erosion of Cavities of injection mould for auto parts	21-8-97	M/s. PECS Ind.
134	26256	Wire Cutting of dies & Punches	do	do
135	2268	Spark Erosion of Cavities in mould plate	28-8-97	M/s. Plasti Craft Lahore
136	26306	Spark erosion of Cavity in die plate	8-9-97	M/s. Best Techniques Lahore.
137	26322	Copy milling of cam	27-9-97	M/s. Packages Ltd.
138	26326	Spark erosion of die plate	30-9-97	M/s. PECS Ind Lahore

II. Training & Human Resource Development: Some Typical Examples

- Mr. Ali Haider Shah & Bahre Karam Asstt Technical Manager of M/s Omer Glass Industries Peshawar were trained in NC Machining Operations from 10-1-1987 to 12-2-1987.

- Mr. Shakeel Akhtar App. Engr. of PITAC trained in NC Programming Operator in 1987

- Mr. Mohammad Shuib, Mr. Rafioq, Mr. Inayat (Apprentice Supervisor) were trained in 1987.

- Apprentice Engineers of PITAC were Trained in NC Operations in 1988-1989.. (Mr. Muhammad Ishtiaq, Mr. Muhammad Ashraf, Mr. Irfan Zaheer, Mr. Khalid Mehmood, Mr. Iftikhar Ahmed, Mr. Amir Mirza & Mr. Adnan Gul.)

- Training extended to 20 Engineers and Technicians of H.M.C. Taxila from 17-2-1990 to 31-3-1990.

- Training imparted to the 5 Engineers from HMC Taxila from 3-11-90 to 29-11-90 in EDM Spak Erosion and Wire Cut.

- Training Extended to 10 technicians of Atlas Honda (Punjdarya Ltd.) from 3-2-1991 to 14-3-1991 on EDM Wire cut and CNC Lathe Machine.

- One day Seminar Conducted on 2-3-1991 for the final year students of University of Engineering & Technology Lahore on Operation of NC/CNC Machine Tools. 60 Students attended.

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- Training on EDM Machining of 20Technicians of Nowshera Sheet Glass Ltd. NWFP Nowshera

- Zafar Abbas Hashim J/E of MIRDC Trained in NC Machining Operations for a period of 6 weeks from 21-10-1992 to 6-12-1992

Ten Instructors of Govt. Apparentice Training Centre Ferozewala Distt. Kala Shahkaku Sheikhupura were trained on NC Machining Operation from 24-3-1994 to 23-4-1994.

- Mr. Tariq Hussain,Technical Officer of Plastic Technology Centre Karachi was trained in NC Machining Operations from 17-2-1990 to 31-9-1990.

- Three Supervisors pf Machine Shop of M/s Panjdarya Ltd Honda were trained on NC CNC Machining Operation from 17-2-1990-to 31-3-1990.

Annex 9

Assistance to PITAC from Donor Agencies

Sr. No.	Name of Agencies	Title of the Project	Duration	Committed Amount	Abstract of the Contents
1	UNDP	Setting up of Low Cost Automation Development Cell	1 Years 1979	US$ 50,000 Equivalent Rs. 500,000	Automation of existing facilities of production through use of Hydraulic, Pneumatic and Electrical Controls relatively Low Cost
2	JICA	Modernization & Balancing of PITAC, Lahore Phase I	3 Years 1983 - 84 to 1985 - 86	Rs. 10.016 Million	To upgrade and modernize the existing facilities of Machine Tool Shop, Heat Treatment, Inspection, A/V Aids and Transport.
3	ILO & UNDP	Establishment of National Supervisory Training Centre	3 Years 1991 - 92 to 1993 - 94	Rs. 12.550 Million	To train Shopfloor Supervisors/Foremen in Supervisory Functions and Provide Advisory Services in Productivity & Quality Improvement.
4	Commonwealth Secretariat	Establishment of Auto CAD training facilities	1996 to 1999	Rs. 1.5 Million	To equip Designing facilities with Auto CAD
5	JICA	JICA's Aftercare programme for PITAC	January 1994 to June 1995	Rs. 12.550 Million	To bear the cost of all the equipment, Spare Parts, Consumable, supplied earlier by JICA in Phase I
6	Mitsubishi Electric Corp. (Melco) Japan	PLC Training Equipment for LCA Lab	1 Year January, 1998 to October, 1998	Rs. 1.00 Million	PLC, PLC Simulation, PC, Digital and Analog Converter, PLC Extension Modules and PLC Program Software
7.	Asian Productivity Organization (APO) Japan	Workshop on Designing of Moulds for Plastic Products	2 Weeks November 29 to December 9-1999	Rs.0.5 Million	An International Training Programme for Supporting Industry & Vendors

LCA: Low Cost Automation
PLC: Programmable Logic Controller

Annex 10 Criteria for selection of Target Products

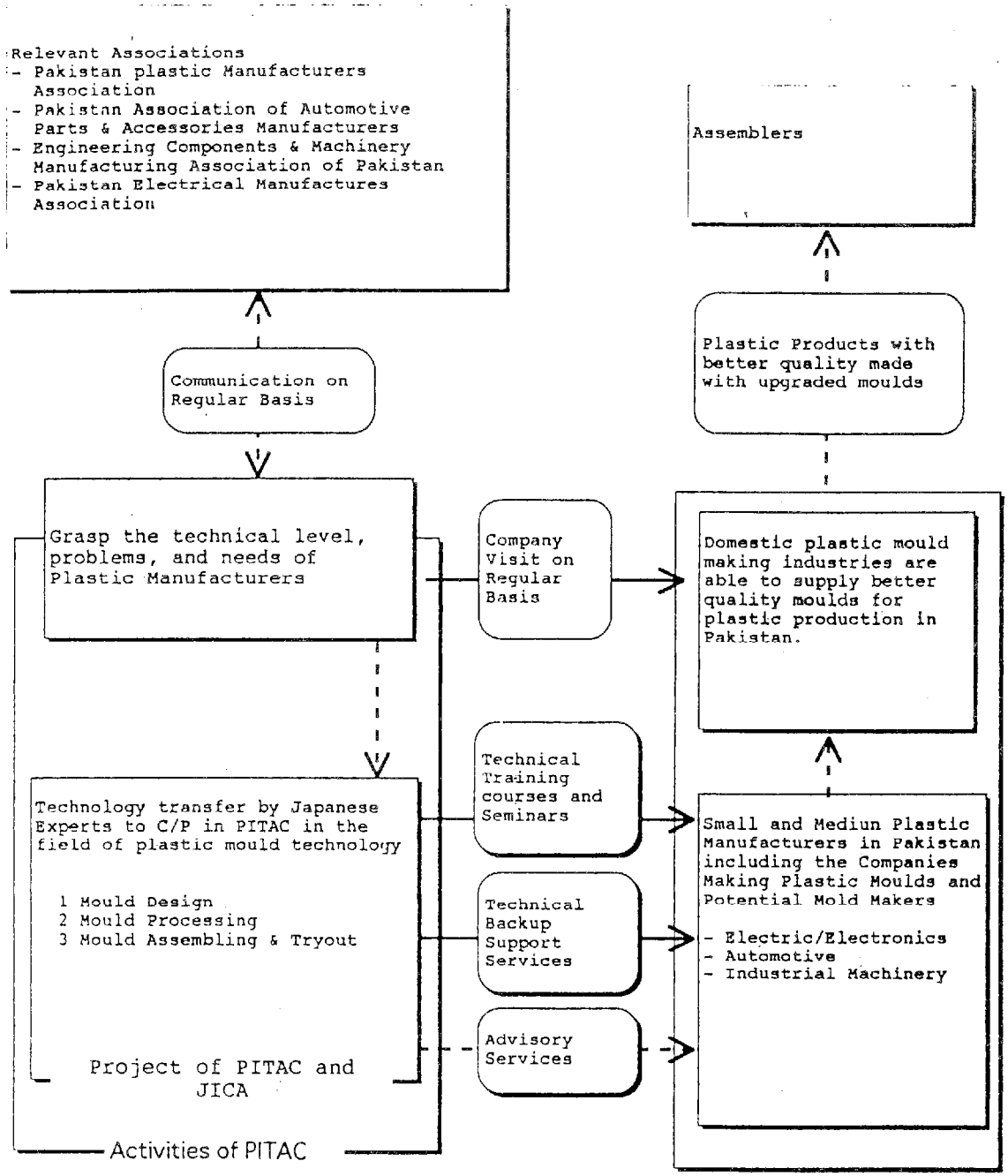
Specific Technical Elements	Appearance (Shape, finishing roughness etc)	Structural Function	Composition of Appearance and Structural Function
Name of Target Product	Front Panel of Personal Computer	Housing for Automobile Electric Components	Front Case of Desk Telephone
Technical Items	- Strength of moulds - Insert parts - Mould design for products with thin thickness - Injection moulding for products with thin thickness - Basic technical elements of moulds	- Mould design based on specific usage of products - Mould Processing technology to achieve expected accuracy - Injection moulding condition to achieve expected accuracy of products	- Mould design both for appearance and Functional elements - Finishing technology - Undercut Treatment - Mould design and processing by 3-D modeling techniques
Technical Level	Middle	Advanced Middle	Advanced
Size of Moulding	350t	150t	350t

Annex 11 Tentative Allocation Plan of Counterpart Personnel (C/P)

Field	Technical Contents to be Transferred	Requirements for C/P	Candidates of C/P	C/P to be recruited in 2000-2001	C/P to be recruited in 2001-2002
Project Director	• Overall responsibility for the administration and implementation of the Project		Mr. M.A.Jabbar Khan		
Project Manager	• Process management of plastic mould making	• Capability to manage total technical aspects of mould making process	Mr. Sarfraz Ahmad		
Plastic Mould Design	• Knowledge and technique to handle mould materials and plastic materials • General mould design technique • Advanced mould design technique such as 3-dimension mould design and intricate mould design • Design technique by CAD/CAM system • Other applied techniques	• Several years of experience in plastic mould designing • Skills to operate CAD, CAD/CAM, or computers • Experience as an instructor or preference to be an instructor	○Mr. Khalid Mahmood Mr. Fahim A. Qureshi Mr. Altaf Mahmood Mr. Muhammad Tariq Pervaiz	Required Number: One (1) Qualification: Being young in age and having computer literacy	Required Number: Two (2) Qualification: Being young in age and having computer literacy
Mould Processing (Conventional Processing)	• Advanced techniques of conventional machine processing • Tool management and setting of optimal conditions for processing • Techniques for pretreatment of materials, preparation for processing, and so on	• Several years of experience in machine or parts processing • Experience as an instructor or preference to be an instructor	○Mr. Muhammad Ashraf Ch Mr. Irfan Zaheer		Required Number: Two (2) Qualification: Having skill of drawing and hopefully experience of machine processing
Mould Processing (CNC Processing)	• Mainly mould processing techniques utilizing CNC machines	• Several years of experience in CNC processing or CNC programming • Experience of using CAD/CAM or skills to use computers • Experience as an instructor or preference to be an instructor	○Mr. Arshad Javid △Mr. Iftikar Ahmad Khan	Required Number: Two (2) Qualification: Being young in age and having computer literacy	Required Number: One (1) Qualification: Being young in age and having computer literacy
Finishing, Assembly, Tryout	• Technique of finishing moulds (polishing and plating) • Technique of mould part inspection • Technique of mould assembly and adjustment • Technique of mould tryout and quality control of the moulded products	• Experience of polishing or surface treatment of metallic materials • Knowledge about the structure of plastic mould • Understanding about the process of plastic mould making	○Mr. M. Shakeel Ch △Mr. Numan Siddiqui (Finishing)	Required Number: One (1) especially for plastic moulding Qualification: Experience of plastic moulding	Required Number: Two (2) - one for finishing one for plastic moulding Qualification: Experience of plastic mould finishing and plastic moulding
Maintenance of Machinery	• Techniques for maintenance and repair of machinery	• Ability to diagnose disorders of machinery and knowledge about electricity	○Mr. Javaid Iqbal Skaikh	Required Number: One (1) Qualification: Knowledge about electricity	
Computer System Networking	• System Network management techniques for CAD/CAM system and CNC processing machines	• Being familiar with computers and having knowledge to deal with technical problems, for example, at the time of startup of the system or occurrence of disorder in the system.		Required Number: One(1) for both design and computer system networking Qualification: Being young in age and having computer literacy	Required Number: One (1) for both design and computer system networking Qualification: Being young in age and having computer literacy

○: Group Leader
△: Sub Leader

Annex 12 Conceptual Image of the Project



Note 1 The legend for the arrow is as follows:

- - -> currently not existing

——> currently existing to be strengthened

Annex 13 Provisional Project Design Matrix (PDM)

as of 11 April 2000

Narrative Summary	Verifiable Indicators	Means of Verification	Important Assumption
(Overall Goal) Domestic plastic mould making industries are able to supply better quality moulds for plastic production in Pakistan.	1 Increase of moulds delivered to plastic parts and components industries 2 Improvement of quality of plastic products 3 Increase of plastic mould making industries	1-1 Industrial Statistics 1-2 Survey Report of PITAC 2 Survey Report of PITAC 3 Survey Report of PITAC	a There is no drastic change in the policy of Pakistan government regarding engineering sectors. b Demand for plastic industry from assembly industry continues to be stable. c Linkage between assembly industry and plastic mould industry is enhanced d Plastic product quality requirement becomes higher in the industries.
(Project Purpose) Technical capability of PITAC is upgraded to extend technical services in the field of plastic mould technology.	1 Level of satisfaction of present and former service beneficiaries 2 Level of satisfaction of industries 3 Number of newly improved services and beneficiaries	1, 2 Questionnaire to and interview with related industries 3 Record of PITAC	a Pakistani plastic mould industries utilize the technology obtained from PITAC. b Demand for quality mould from plastic industry is increasing in trend
(Outputs of the Project) 0 The project operation unit is established. 1 The necessary machinery and equipment are provided, installed, operated and maintained properly. 2 Technical capability of the counterpart personnel (hereinafter referred to as "C/P") is upgraded. 3 Technical training courses and seminars are implemented systematically. 4 Technical backup support services are implemented systematically. 5 Advisory services are implemented systematically.	0 Number and capacity of staff, budget and settlement account,number of committees and meetings, number of publicity. 1-1 Contents and condition of machinery and equipment 1-2 Route to get spare parts and situation to secure spare parts 2-1 Assessment by the Japanese experts 2-2 Number of achieved Target Product 2-3 Manuals, textbooks and training materials developed 3-1 Number of training courses and their participants 3-2 Number of seminars and their participants 4-1 Number of mould designs and its clients. 4-2 Number of implemented Trial prototyping and its clients 5-1 Number of implemented technical advisory services including for their clients	0 Organization Chart, Administration Record, Accounting Record, Personnel record 1-1 Property record, operation & maintenance record 1-2 Spare parts list, suppliers list 2-1, 2-2, 2-3 Record of PITAC 3, 4, 5 Record of PITAC	a Trained C/Ps remain at PITAC.

(Activities)	Inputs		a C/P personnel remain at PITAC.
	The Pakistani side	The Japanese side	
0-1 Allocate necessary personnel as planed. 0-2 Formulate plans of activities. 0-3 Make budget plan and execute it properly. 0-4 Establish and operate project management system. 1-1 Refurbish building and facilities for the project. 1-2 Provide and install necessary machinery and equipment. 1-3 Operate and maintain the machinery and equipment properly. 2-1 Make Technical Cooperation Program. 2-2 Implement technology transfer to the C/P. 2-3 Monitor and evaluate the result of technology transfer to the C/P. 3-1 Identify needs through company visits 3-2 Make plans of technical training courses and seminars. 3-3 Develop training curricula and teaching material 3-4 Implement the technical training courses and seminars. 3-5 Monitor and evaluate the result of technical training courses and seminars. 4-1 Identify needs through company visits 4-2 Make plans of technical backup support services. 4-3 Implement the technical backup support services. 4-4 Monitor and evaluate the result of technical backup support services. 5-1 Identify needs through company visits 5-2 Make plans of advisory services. 5-3 Implement the advisory services. 5-4 Monitor and evaluate the result of advisory services.	1 Provision and Maintenance of Building and Facilities 2 Allocation of C/P and Administrative personnel (1) Administrative C/P (2) Technical C/P at the commencement (3) Administrative Staff Necessary number (4) Supporting Staff a Secretary b Driver c Other necessary staff upon request by the Japanese experts 3 Provision of Machinery & Equipment and their Maintenance 4 Local Cost Necessary budget for the implementation of the Project	1 Dispatch of Japanese Experts (1) Long-term Experts (2) Short-term Experts Appropriate number of short-term experts will be dispatched as necessity arises. 2 C/P Training in Japan A certain number (about 2 persons) of the C/P yearly 3 Provision of Machinery and Equipment 4 Supporting Local Cost	(Preconditions) a Refurbishment of building and facilities for the project is completed b Qualified new staff is recruited for PITAC

(3)

Annex 14 Provisional Technical Cooperation Program (TCP)

Calendar Year	2000				2001				2002				2003				2004				2005		
Activities / Japanese Fiscal Year	2000				2001				2002				2003				2004				2005		
	I	II	III	IV	I	II	III	IV	I	II	III	IV	I	II	III	IV	I	II	III	IV	I	II	III
			Signing of the R/D																				
Term of Technical Cooperation			▼																				
0. Fundamentals (common items)																							
0.1. Precondition for mold technology																							
0.2. Principles of injection mold																							
0.3. Standard of mold design																							
0.4. Fundamentals of processing mold and plastic injection molding																							
0.5. Fundamentals of computer									Follow-up														
1. Injection mold design																							
1.1. Fundamentals of mold design																							
1.2. Mold design by CAD/CAM									Follow-up														
1.3. Design of prototyping molds (for needs of model companies etc.)																							
1.4 Solve problem after trial shot (problems and solution of assembling of injection molding)									Follow-up														
2. Injection mold processing																							
2.1. Fundamentals of processing																							
2.2. Operation and function of processing machines									Follow-up														
2.3. Processing of target products									Follow-up														
2.4. Processing of prototyping molds																							
2.5. Maintenance of machine and processing problem etc.									Follow-up														
3. Mold assembling & maintenance and trial shot of injection molding																							
3.1 Fundamentals of finishing									Follow-up														
3.2. Fundamentals of mold assembling and correcting									Follow-up														
3.3. Trial shot of injection molding																							
3.4. Assembling and trial shot of target product prepared in the project									Follow-up														
3.5. Assembling and trial shot injection of prototyping molds																							
3.6. Solve problems on injection molding and mold									Follow-up														
3.7. Regular check and maintenance of machines									Follow-up														
4. Monitoring and necessary feedback (Supplementary Technology Transfer)																							

(3)

Annex 15 Tentative Schedule of Implementation (TSI)

Calendar Year	2000				2001				2002				2003				2004				2005		
/ Japanese Fiscal Year	2000				2001				2002				2003				2004				2005		
	I	II	III	IV	I	II	III	IV	I	II	III	IV	I	II	III	IV	I	II	III	IV	I	II	III
			Signing of the R/D																				
Term of Technical Cooperation			▼																				
The Japanese side																							
I Dispatch of Mission																							
(1) Preliminary Study																							
(2) Supplementary Study																							
(3) Implementation Study																							
(4) Management Consultation																							
(5) Evaluation																							
II Dispatch of Long-term experts																							
(1) Chief Advisor																							
(2) Coordinator																							
(3) Mold Design									To be discussed in the following studies														
(4) Mold Processing																							
(5) Mold Assembling and Trial Shot																							
III Dispatch of Short-term experts																							
									Short-term experts on specific fields will be dispatched, if necessary														
IV Training of the C/P in Japan																							
					A certain number of the C/P will be accepted in Japan annually																			
V Provision of Machinery and Equipment																							
The Pakistan side																							
I Building and Facilities																							
II Machinery and Equipment																							
III Allocation of the C/P and necessary staff																							
IV Allocation of Budget																							

Annex 16 Provisional List of Machinery and Equipment for the Project

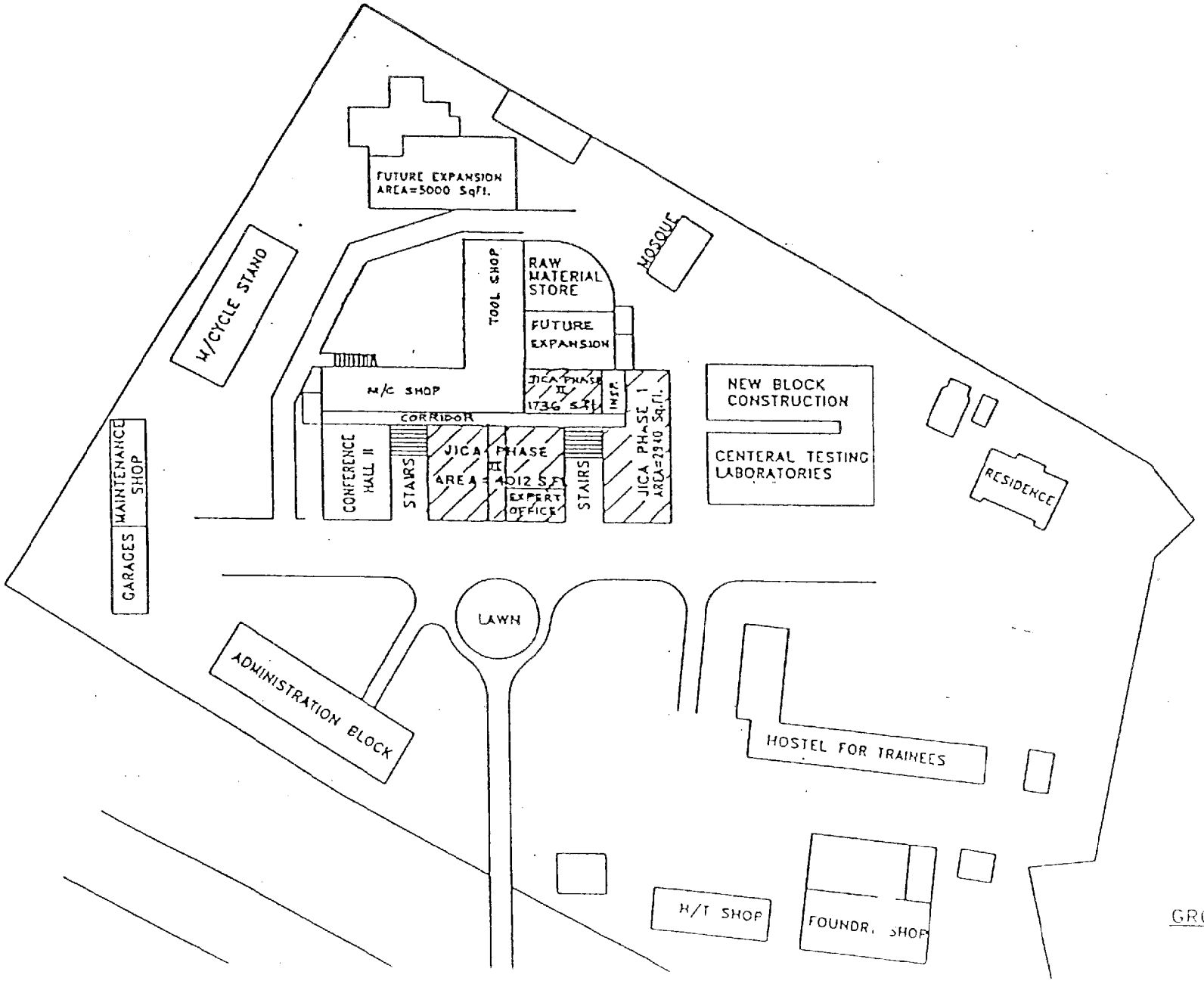
Field	Equipment/Machinery	Q'ty	Availability (Refer to Footnote)	If to be procured,by Japan or Pakistan
Mold Design	CAD/CAM SYSTEM NET-WORK STATION	1set	P	Japan
	AVR UNIT (Server & Client)	1set	P	Pakistan
	UPS UNIT (Server & Client)	1set	P	Pakistan
	Working Desk and Chair	10set	P	Pakistan
	Desk for LBP	1	P	Pakistan
	Desk for Server	1	P	Pakistan
Mold Processing	CNC Vertical Milling Machine	1	U	Phase I
	CNC Vertical Milling Machine	1	I	Japan
	CNC Vertical Machining Center	1	P	Japan
	Electric Discharge Machine	1	U	Phase I
	Electric Discharge Machine	1	I	Japan
	Wire-cut EDM	1	U	Phase I
	Wire-cut EDM	1	I	Japan
	Small Hole Drilling Machine	1	P	Japan
	Vertical Milling Machine	3	U	Pakistan
	Tool Presenter	1	P	Japan
	Tools & Jigs	1set	P	Japan
	Tools & Holders	1set	P	Japan
	Profile Grinder	1	I	Japan
	Surface Grinder	1	I	Japan
	Lathe	2	U	Pakistan
	Polishing Equipment	1	P	Japan
	Tool Grinder	1	U	Pakistan
	Bench Grinder	1	U	Pakistan
	Band Saw	1	R	Pakistan
	Working Desk	4	P	Pakistan
	Tool Locker	1	P	Pakistan
	Rack	2	P	Pakistan
	Stocker	2	P	Pakistan
Mold Assembly &	Large Size Injection Machine(350ton)	1	P	Japan
Injection Try-out	Middle Size Injection Machine(150ton)	1	P	Japan
	Flexible Mold Temperature Control	2	P	Japan
	Temperature Control	2	P	Japan
	Plastic Material Drier	1	P	Japan
	Model Mold for Plastic Injection	3	P	Japan
	Welding Machine for Mold Repairing	1	P	Japan

Field	Equipment/Machinery	Q'ty	Availability (Refer to Footnote)	If to be procured,by Japan or Pakistan
	Assembly Tool unit	3set	P	Japan
	Polishing & Finishing Unit	3set	P	Japan
	Working Desk	4	P	Pakistan
	Mold assembly bench (1200mm x 2400mm)	1	P	Pakistan
	Mold rack	2	P	Pakistan
	Tool Locker	1	P	Pakistan
Inspection	Coordinate Measuring Machine*	1	P	Japan
	Projection machine.	1	U	Phase I
	Clearance Gauge	10	P	Japan
	Surface coarseness meter.	1	P	Japan
	Tool Makers' Microscope	1	P	Japan
	Pin gauge	1set	U	Phase I
	Block gauge	1set	U	Pakistan
	Gaduge Unit	1set	U	Pakistan
Others	Visual Education Set etc.	1set	P	Japan
	Text Books	1set	P	Japan
	Fork —Lift	1	P	Pakistan
	Trolly	5	P	Pakistan
	Crane(3 or 5 ton)	1	P	Pakistan
	Compressor	1set	I	Pakistan
	Generator	1	P	Pakistan
	Stabilizer	1	P	Pakistan
	Water Treatment Plant	1	P	Pakistan

NOTE: U:Existing and to be used.R:Existing but to be replaced.I:Existng but to be Increased in no.P:To be procure

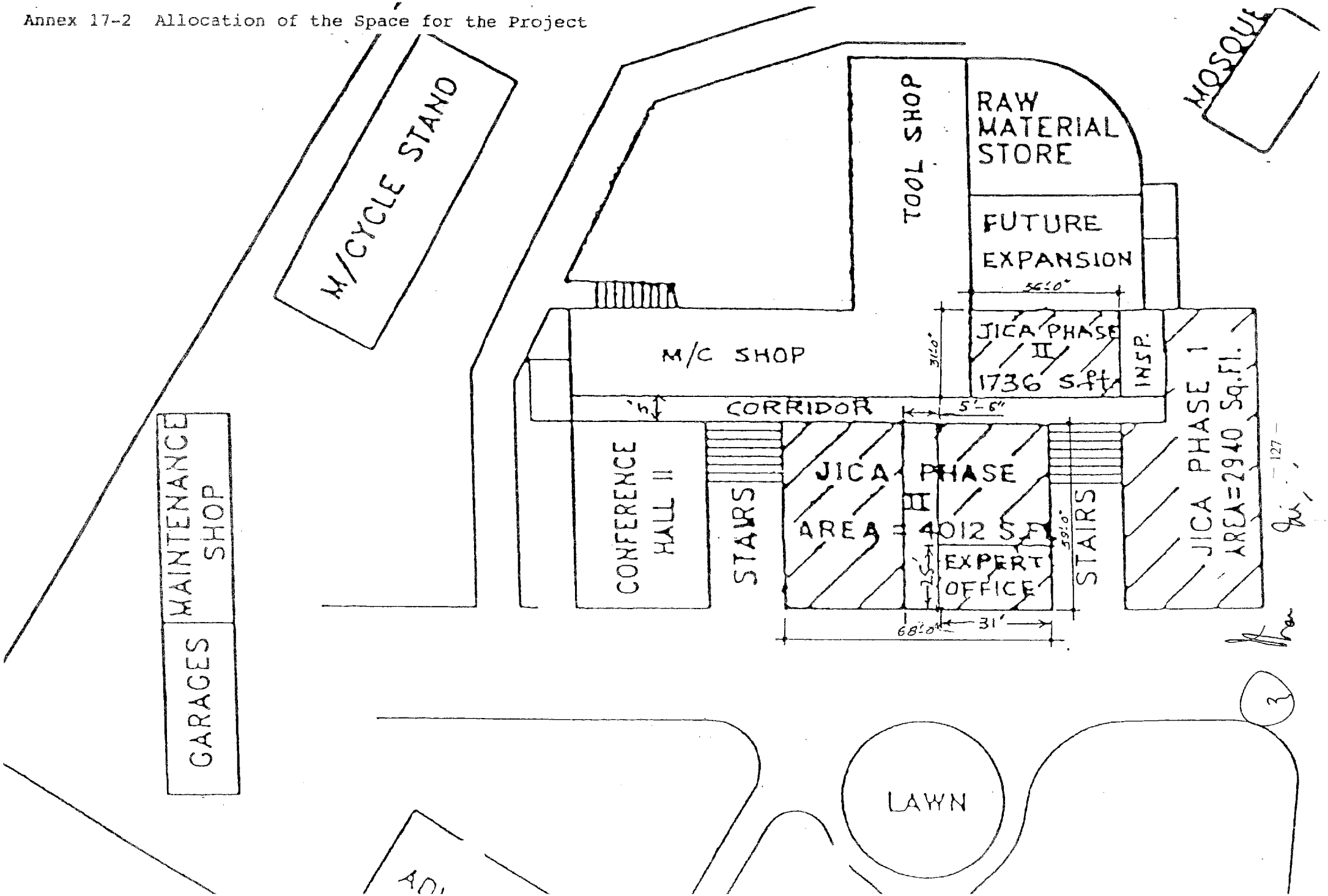
*:A means of Coordinate Measuring Machine and it's way of procuring should be reexamined by the time of supplementary study.

PAKISTAN INDUSTRIAL TECHNICAL ASSISTANCE CENTER LAHORE
HEAD OFFICE AND WORKSHOPS
(PROPOSED LOCATION OF THE SITE FOR JICA PROJECT PHASE-II)



GROUND FLOOR

Annex 17-2 Allocation of the Space for the Project



Annex 18

The Budget Allocated for the Project

(In Pak Rupees)

Sr. No	Items	1st Year	2nd Year	3rd Year	Total	Remarks
1	Civil Work and Renovation of existing building	3,500,000	1,000,000	-	4,500,000	
2	Custom Duty	-	-	-	-	Exempted
3	Internal Transportation of Machinery and Equipment	-	150,000	150,000	300,000	
4	Erection & Installation of Machinery and Equipment	-	250,000	-	250,000	
5	Purchase of Essential Tools and Operating Items (Local)	-	200,000	-	200,000	
6	Pay and Allowances of fresh requited staff.	500,000	500,000	500,000	1,500,000	
7	Computers	-	100,000	-	100,000	
8	Additional Auxiliary Equipment	-	-	1,000,000	1,000,000	
9	Maintenance	-	-	500,000	500,000	
10	Supplies	-	-	-	-	Expenditure will be met out of existing Budget of PITAC
	Total	**4,000,000**	**2,200,000**	**2,150,000**	*** 8,350,000**	

*** Exclusive of 25% Escalation Cost**

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Annex 19 The Function and Provisional Composition 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 Provisional Composition

(1) Chairperson

Secretary, Ministry of Industries and Production

(2) Committee Members

(Pakistani side)

a Project Director (PITAC Project)
b Joint Secretary of Ministry of Industries and Production
c Joint Secretary of Ministry of Finance and Economic Affairs (Economic Affairs Division)
d Representative(s), National Productivity Council
e Representative(s), Pakistan Plastic Manufacturers Association
f Representative(s), Pakistan Association of Automotive Parts & Accessories Manufacturers
g Representative(s), Engineering Components & Machinery Manufacturing Association of Pakistan
h Representative(s), Pakistan Electrical Manufacturers Association
e Other personnel concerned with the Project decided by the Pakistani 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 Pakistan
e Other personnel concerned to be decided and dispatched by JICA, if necessary

NOTE:

Official(s) of Embassy of JAPAN in Pakistan may attend the Committee as observer(s).

Annex 20 The Items to be Followed-up by Both Sides

Item	In Charge	Way to follow-up	Due date
1 Industrial Policy and Rolling Plan	Pakistani side	Informing the outline of the policy and the plan that are announced	by the next Supplementary Study
2 Budget to be allocated for the Project	Pakistani side	Informing the approved project budget for fiscal 2000-2001	by the next Supplementary Study
3 Budget of PITAC in 2000-2001	Pakistani side	Informing the approved budget of PITAC for fiscal 2000-2001	by the next Supplementary Study
4 Personnel Recruitment Schedule	Pakistani side	Informing the following items: - number of personnel to be recruited in 2000-2001 based on the approved budget - field of expertise of each personnel - Schedule of recruitment	by the next Supplementary Study
5 Reason for the necessity of 500t injection moulding machine based on reliable data	Pakistani side	Providing the following information: - Reliable data that shows the present needs in private sector for the 500t injection moulding machine - Specific name of the products that would be highly demanded in Pakistan in near future and are required to be moulded with 500t machine - conventional way to produce the products asked in the previous item	by the end of May, 2000
6 List of administrative and Supporting Personnel	Pakistani side	Reporting the list of personnel to be involved in the Project other than C/P	by the next Supplementary Study
7 Recommendation on the layout of machinery and equipment in the scheduled project site	Japanese side	Submission of possible layout plans and required condition for machinery and equipment based on tentative plan in the Preliminary Study	by early June, 2000
8 Plan of Operations (PO)	Japanese side	Submission of provisional PO	by the next Supplementary Study
9 Result of reexamination on the necessity of 500t Injection Moulding Machine	Japanese side	Informing the result of reexamination to be made based on the information from Pakistani side described as the item 5 above	by the next Supplementary Study
10 Result of examination on the measuring machine required for the Project exporting Coordinate Measuring Machine	Japanese side	Informing the result of examination on the kinds of measuring machine required for the Project, and the possible way to procure, install, and maintain the machine in the Project	by the next Supplementary Study

Annex 21 The List of Attendees of the Discussions

Japanese side

1	Preliminary Study Team	
	Ms. Kyoko Kuwajima	Leader
	Mr. Yoshikazu Matsuura	Technical Cooperation Program
	Mr. Masahiro Chiji	Mold Technology
	Mr. Atsuhiko Hatakeyama	Machinery and Training Planning
	Ms. Asuka Okayama	Cooperation Planning
2	Embassy of Japan	
	Mr. Hiroaki Takahashi	First Secretary
3	JICA Office	
	Mr. Yasumitsu Kinoshita	Staff
	Mr. Sohail Armad	Senior Programme Officer

Pakistani side

1	Ministry of Industries and Production	
	Mr. Muhammad Sharif Ijaz Ghouri	Senior Joint Secretary
	Mr. Syed Sajjad Haider	Senior Joint Secretary
	Mr. S. Ali Nasir	Deputy Secretary Development and Planning
	Mr. Muhhtar Haider Shah	Deputy Secretary (Admn.)
	Mr. Ahmad Farooq	Deputy Secretary (Pers.)
	Mr. Mushtaq Khan	Assistant Chief (Projects)
2	Economic Affairs division	
	Mr. S. M. Hasan Zaidi	Deputy Secretary
	Mr. Azhar Saeed Malik	Section Officer
3	PITAC	
	Mr. M.A.Jabbar Khan	General Manager, Head of NPO Leader of Pakistan Team
	Mr. Sarfraz Ahmad	Manager Enterpreneurship Training Training & IE
	Mr. Javaid Iqbal Sheikh	Manager Maintenance Elect.
	Mr. Arshad Javaid	Manager NC shop
	Mr. Muhammad Shakeel Choudhary	Manager Machine Shop/Maintenance Mech.