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THE CHINA GARMENT TECHNOLOGY DEVELOPMENT CENTRE

DP/CPR/85/055/11-01

CHINA

Technical report: First visit of the  
Chief Technical Adviser\*

Prepared for the Government of the People's Republic of China  
by the United Nations Industrial Development Organization  
acting as executing agency for the United Nations Development Programme

Based on the work of Don A. Hague  
Chief Technical Adviser

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United Nations Industrial Development Organization  
Vienna

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### APPENDIX 1 LIST OF PEOPLE

#### ATTACHED TO BE INCLUDED IN REVISED PROJECT DOCUMENT:

	ACTIVITIES	(3 pages)
	UNDP INPUTS	(1 page)
	PROJECT BUDGET/REVISION ALLOTMENT DOCUMENT	(3 pages)
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ABBREVIATIONS

TGIDC	Textile Garment Technology Development Centre
UK	United Kingdom
FRG	Federal Republic of Germany
PESR	Pilot/Experimental Sewing Room
MSTIU	Marketing Service and Technical Information Unit
CAD/CAM	Computer Aided Design/Computer Aided Management
PAC	Project Appraisal Committee
PPER	Project Performance Appraisal Reports
TPR	Tri-partite Review
MTI	Ministry of Textile Industry
CTA	Chief Technical Adviser

Exchange rates:

During the period of this mission, 16 August 1987 to 4 September 1987 the following exchange rate prevailed:-

US \$1 = RMB¥ 3.71

## I INTRODUCTION

The mission began on the 16th August 1987 in Beijing, and lasted for three weeks. The majority of the mission was spent in Hangzhou, and consisted mainly of meetings and discussions, with a few visits to factories and institutions and two lectures. For the first four days (16th to 20th August) and 27th to 29th August, I was accompanied by Mr J P Moll of HQ staff.

The objectives of the mission were to:-

- prepare a detailed work plan
- advise on the equipment of the Centre
- assist in arranging fellowships and study tours
- assist in defining specific roles of other experts
- provide latest information on garment design, manufacturing techniques and garment function research, and give lectures
- advise on training activities listed in outputs
- assist in liaising with overseas industries, institutions and other establishments

These objectives were largely met, although the same objectives should stand for subsequent visits. Where objectives were only partially met, this is due to the fact that the TGIDC is almost two years behind the original schedule envisaged in the Project Document. No proper buildings are available, and recruitment of staff has only just begun.

Parts of the Project Document have had to be amended as a result of this time slippage, and each amended item was thoroughly discussed with the Project Director and various officials from national and local government.

Agreement was sought and obtained wherever an amendment involved a slight change of emphasis, both with all the officials concerned and with Mr J P Moll.

Wherever parts of the Project Document needed amending, those parts are attached as appendices/annexures of this report.

A detailed Work Plan for the whole project period is not practicable; the buildings are behind schedule and recruitment is proving to be more difficult than first envisaged.

Some adjustment of UNIDO Inputs has been necessary and also a revision of the Project Budget over the years 1987-1990.

## II RECOMMENDATIONS

1. Arrangements should be made immediately for the Subcontracting of Technology in order to get the Production Engineering expert in the field for mid January 1988. (UNIDO)
2. A vehicle (estate car) should be purchased before January 1988. (UNIDO)
3. An expert in Production Engineering/Garment manufacturing systems should be fielded for a split-mission, 7 man-month assignment. He should work with 3 or 4 factories in Hanzhou in order to improve layouts, methods and productivity. The mission should be organised as follows:-
  - 18 January to 12 February (1 m/m) visit factories, assess needs and prepare work plan (two stages).
  - 14 March to 3 June (3 m/m) implement stage one of plan.
  - 4 July to 23 September (3 m/m) implement stage two of plan.
4. Temporary accommodation should be sought and rented and furnished by February/March 1988.
5. CAD equipment should be ordered now for delivery by mid 1988. (UNIDO)
6. Recruitment should proceed in order to provide staff to take up Fellowship places. Recruitment should be nation-wide and not just confined to graduates from educational institutions in Hangzhou.
7. No more equipment should be purchased other than that recommended above, either from Chinese sources or UNIDO sources until after the next CIA review visit (scheduled for May 1988).
8. CAD equipment must not be installed in either sub-standard accommodation in Hangzhou, or in the University of Shanghai. It should be installed in good accommodation where it can be fully utilised for the benefit of the industry. Any research into CAD software programmes should be carried out on the locally purchased Apollo computer.
9. Decisions on the timings of the fielding of other experts should be deferred until after the next CIA visit.

### III STUDY TOURS AND FELLOWSHIPS

#### A Study Tours

It was requested by the Project Director and local staff that the number of Study Tours should be reduced to twelve persons on three tours. This presents no problem as only the first Study Tour is close to final arrangements.

The Study Tours will now be as follows:-

- Study Tour A - five persons (head of department or senior officials) for four weeks, taking a general look at advanced industry, technology and institutions in UK and FRG.
- Study Tour B - three persons mainly studying design (and product development)
- Study Tour C - four persons studying textile and garment testing, and computer applications.

The relevant section of the Project Document has been rewritten to accommodate these changes.

The Study Tours will take place as follows:-

- A: October/November 1987
- B: June 1988
- C: April 1989

## B Fellowships

Originally, fourteen Fellowships of six man-months duration each were envisaged, making a total of 84 man-months. It has been requested that this should now be increased to sixteen Fellowships with a total of 96 man-months.

It has long been my view that there was a misconception of what was intended by the establishment of a Model Design Studio. It was very apparent that the local staff saw the function as introducing "haute couture" and organising fashion shows. This concept would have some application if there were an industry capable of manufacturing to a high quality level. Unfortunately this is not the case, and I was able to persuade the local staff and some representatives of industry that Product Development and Styling is the part of the overall Design concept that needs introducing into the TGIDC so that the industry can start to advance.

Having established this fundamental change of attitude, the emphasis of the "Design" Fellowships was changed. One person will follow a full academic year long course studying "Design" and two others will study Product Development in Factories.

One Fellowship from the Pilot/Experimental Sewing Room (PESR) has been amended to include basic computer software writing.

Two extra Fellowships, one for the Director and one extra for the Marketing Service and Technical Information Unit (MSTIU). These will be of 4 man-months duration.

The full list of Fellowship Programmes is contained in the rewritten Appendix 2.



#### IV EQUIPMENT

Some difficulties have been experienced with equipment. The local staff have purchased an Apollo computer from local funds, and a request was made to supply the peripheral equipment (to make up a CAD/CAM unit) from UNIDO funds. This is not feasible mainly because of the reluctance of the suppliers of such items to supply equipment to be served by another computer. There would be the problem of guarantees, even if all the equipment could be successfully interfaced.

It was also suggested that the equipment should be located at the University of Shanghai so that research could be carried out. The "research" is into CAD software. I explained that the research would take a very long time - several years - in order to reach the same level as the software which is currently available. This would not be in the best interests of the industry, which needs assistance in the production of patterns, and markers now. It was finally agreed to locate the equipment in Hangzhou and use it whenever possible to serve the industry.

The design of the new building has imposed limitations on the CAD and cutting equipment originally specified. The building is curved, and installing cutting-tables of some 15 to 20 metres in length might prove difficult. The role of the second cutting table is now in some doubt, so it was decided to reduce to just one 7.5 m. table. This should present no installation problems and will also reduce the cost.

Costs of equipment have increased since the original specification and target price was published. This increase can be attributed mainly to normal inflation and the fall in the value of the US dollar against some other currencies.

Even with a reduction in the amount of hardware specified (see Appendix 3) the equipment costs have risen.

Several items of computerised sewing equipment have been purchased from local funds. The immediate value of these items is questionable at the present time, and they appear to have been bought with no specific application in mind. Indeed, it has been stressed that computerised equipment should only be used in China where the equipment is going to improve quality, and not for improving productivity alone. When measured against prevailing labour costs, computerised equipment is never likely to achieve a return on the investment before the equipment is either obsolete or worn out.

Two particular items were requested by the Director.

One was an additional vehicle, and after discussions with Mr Moll, it was decided that an estate car would be the most appropriate item. This vehicle should be purchased immediately so that it can be ready for the first expert to use commencing January 1988.

The other item was a photo-processing unit, in order to develop 35 mm film and print up to A4 size copies. These would then be included in the magazine from time to time. The sum quoted by the local staff was between \$40,000 and \$50,000. Mr Moll and I felt that this was an excessive amount of money to spend on a machine that would probably only process a few photographs each month. It would be more cost effective to use a traditional photographic enlarger. I subsequently learned (on my return to UK) that the likely cost of such equipment could be in excess of \$150,000. It is true to say that the equipment can process many thousands of films per day. This potential is way outside the scope of

this project.

It may be possible to use the CAD equipment with its associated colour printer, to produce poster quality prints.

A short list of other items such as:-

Easi-cut system  
Sewing machine attachments  
Top-rating tester

were given to the CIA for possible inclusion into the final equipment list.

It was agreed with Mr Moll, that unallocated funds should be held in abeyance for the time being, and decisions on spending such sums should be taken as the project progresses. These funds have been placed on Budget Line 51.00.

## V BUILDINGS

The building plan for the project has fallen well behind schedule. The original plan for four main buildings, amended by me in 1985 to three main buildings, has now been abandoned. Some difficulties in securing a suitable piece of land have been experienced, but now land has been obtained, and a new, futuristic, building has been designed (see attached photographs)

The new building will incorporate a lecture theatre, restaurants, a shopping mall, work rooms, offices, training rooms and accommodation. The building plot is at a busy junction in the city centre, and clearance of the site is about to commence. The shell of the building is expected to be complete by the end of 1988 or early 1989, with the decoration/finishing completed by the end of 1989 or early 1990.

These dates obviously have some effect upon the way in which the project is implemented and progressed, and these changes have been incorporated into the new list of activities.

In the meantime, the Centre has taken temporary accommodation in the old housing complex next to the existing Textile Testing Laboratory. This accommodation is totally unsuitable for the purposes of establishing a Textile Garment Technology Development Centre - albeit on a temporary basis. There is no room large enough or suitable enough to house anything but the smallest item of equipment. There are no rooms suitable for conducting any training. The local project management have been appraised of the views of Mr Moll and myself, and have been requested to find alternate suitable accommodation in order to allow the project to progress. This has been agreed, and I was shown two possible sites. One in a factory had the correct floor area, but the room was far too high and there would have been a problem in dividing the floor space into suitable sized rooms to house the various elements of the TGDC.

The other site is located on the top floor of a two year old pilot/experimental sewing plant (belong to the Light Industry Department). The plant is several kilometres outside the city and is a twenty minute car drive away. The building is ideal. The floor area is already divided into usable areas. It is light and airy. The only drawback is distance from the city centre and the Director has expressed a view that even if this accommodation were to be rented, then he would still prefer to keep his office at the old site in the city.

No decision has been taken, and the local project management have been requested to continue the search for premises - keeping the Light Industry pilot plant as the "standard". If accommodation of the same standard could be located closer to the city centre, then everyone would be satisfied. However, I feel that no CAD and cutting equipment should be delivered until suitable temporary accommodation has been found.

## VI EXPERTS/SUBCONTRACT

During the first meeting, which was attended by Ministry officials as well as local project staff, it was stated that a subcontract of the technology input was not acceptable. The system of recruiting individual experts was preferred. The difficulties of recruiting such experts was explained, particularly when it was suggested that a designer of "household names" calibre should be sought.

After the change in attitude towards the overall design concept had been achieved, then it was suggested by me that possibly a designer could be sought as an individual expert but for a shorter term than was originally conceived, and also the CAD expert might be recruited as part of the equipment purchasing package. (I have since ascertained that this would be possible from one of the equipment suppliers; the cost being travel and subsistence only).

It was felt that the remaining technology input should be subcontracted - particularly as a lot of the work will have to be done directly with the factories, and a "company approach" is more likely to be effective than several "individual approaches". Mr Moll was in complete agreement, and after visiting a garment factory on his return to Hangzhou re-iterated this position. The local project management accepted the proposal and Mr Moll contacted the officials in Beijing (Mr Zhu and Mr Lang) and got their approval.

The Terms of Reference for Subcontracting have been rewritten, and Job Descriptions have been produced for the two individual experts.

The technology input will now be achieved by:-

- a. Design Expert 1 m/m date to be decided later  
but probably late 1989
- b. CAD Expert 2 m/m to coincide with delivery of  
equipment - probably second half of  
1988
- c. Subcontract for:-
  - i. Garment technology/  
Production Engineer 7 m/m commencing January 1988
  - ii. Garment technology/  
Management Expert 5 m/m )
  - iii. Quality Control Expert 2 m/m )
  - iv. Training Expert 2 m/m ) dates not yet decided
  - v. Unspecified time 3 m/m )

The RBAP Project Appraisal Committee (PAC) recommended the increase in man-time of the Chief Technical Adviser to 4 man months. This was noted and the costings cross-checked. The additional cost did not appear to have included any extra travelling expense. The number of CTA visits has been increased to spread the CTA's time across the project and take account of UNIDO requirements such as PPER's, Mid-term Evaluation visits, TPR's and Terminal Evaluation. The CTA is now scheduled to make a total of six visits to the project in order to cover all the necessary events. This will require 4.25 man-months. The UNIDO Inputs have been adjusted accordingly.

## VII CONCLUSIONS

The needs of the project have changed slightly from the original concept of 1985. The changes recommended in this report reflect the need for those changes. No doubt, as each review takes place, some adjustment in the implementation and activities of the project will be necessary.

The project needs more positive direction towards serving the industry by way of improvements to quality and productivity. I sensed that there was a movement towards the establishment of a pure research establishment which would have ignored the industry's needs. These points have been made to the local project management, and hopefully, the adjustment to an industry-based establishment will now be made. The introduction of the first expert to work with a few factories, commencing January 1988 will do much to lay the emphasis on industry needs.

The buildings are a priority, and every effort must be made to complete on time or ahead of time. Any further delays will seriously affect the project.

The local management practice of buying odd items of equipment is not really serving the project objectives and could result in a costly selection of unusable items being gathered under the roof of the TGIDC.

There was a call from a Ministry official for faster implementation of the project. This is not really practicable until some suitable accommodation is found. Any undue haste could cause serious setbacks in implementation, as could changes of opinion after agreement to a course of action has been achieved. Any change now in the already agreed methods of implementation will result in serious delays which could, in my opinion seriously affect the viability of the project.

My thanks go to all those people whom I met during this mission. A full list of names is attached to this report.

LIST OF PEOPLE MET DURING MISSION

BELJING

Manfred Kulesa	Resident Representative, UNDP
Caterina Bernadelli	Programme Officer, UNDP
Zhu Xing	Dept of Foreign Affairs, MTI
Huang Zhao Pei	Dept of Science and Technology, MTI
Tan An	China National Garment and Design Centre
Xue Quing Cheng	Dept of Foreign Affairs, MTI
Chen Baoxin	Dept of Foreign Affairs, MTI
Xu Sumei	Dept of Foreign Affairs, MTI
Yao Shen Hong	China International Centre for Economic & Technical Exchanges, Ministry of Foreign Economic Relations & Trade

HANGZHOU

Shen Yan	Textile Garment Technology Development Centre
Cheng Xiao Ming	Textile Garment Technology Development Centre
Mdm Zhou	Textile Garment Technology Development Centre
Lang Sheng Shuo	China International Centre for Economic & Technical Exchanges, Ministry of Foreign Economic Relations & Trade
Li Lifeng	Light Industry Dept., Zhejiang Province
Zhang Enyuan	Foreign Economic Relations & Trade Bureau of Zhejiang Province
Cai Jin Lin	Fuqiang Clothing Factory
Shi Xiao Lin	Dept of Science and Technology, MTI
Dai Da-Ming	Director, Light Industry Dept., Zhejiang Province
Xu Yun Hong	Deputy Mayor, Hangzhou Municipal People's Government
Chen Jun Fu	Vice Dept Head, Light Industry Dept., Zhejiang Province
Dong Jia Lin	Deputy Manager, Zhejiang Textile Industry Corporation

E. ACTIVITIES

1. Visit of C.T.A. to check progress and replan project timings. 3 m/w August/Sept.1987
2. Make final arrangements for the Subcontracting of Technology input. by end of October 1987
3. Study Tour A. 5 Chinese department heads (refer Appendix 2 for detail) 5 x 4 m/w. October/November 1987
4. Fellowship Programme (iii). 1 Chinese Technologist from Pilot Sewing Room (refer Appendix 2 for detail) 6 m/m January/July 1988
5. Fielding of Garment/Production Engineering specialist to carry out work with selected factories. Split mission 7 m/m January/October 1986
6. Fellowship Programme (vii). 1 Chinese Technologist from Design Studio. (refer Appendix 2 for detail) 6 m/m February/August 1988
7. Fellowship Programme (ii). 1 Chinese Technologist from Cutting Preparation Unit (refer Appendix 2 for detail) 6 m/m March/September 1988
8. Fellowship Programme (iv). 1 Chinese Technologist from Testing Laboratory. (refer Appendix 2 for detail) 6 m/m May/November 1988
9. Visit of C.T.A. to review progress, plan unspecified activities and prepare for Project Progress Evaluation Report. 2 m/w May 1988
10. Study Tour B. 3 Chinese Technologists (refer Appendix 2 for detail) 3 x 4 m/w May 1988
11. Fellowship Programme (v). 1 Chinese Technologist from Marketing Service and Technical Information Unit. (refer Appendix 2 for detail) 6 m/m June/December 1988
12. Fellowship Programme (vi). 1 Chinese Technologist (Mechanic) from Pilot Sewing Room. (refer Appendix 2 for detail) 6 m/m June/December 1988
13. Fellowship Programme (xv). 1 Chinese Technologist from Marketing Service and Technical Information Unit. (refer Appendix 2 for detail) 4 m/m June/October 1988
14. Project Performance Evaluation Report (PPER) July 1988

15. Fellowship Programme (i). Chinese Technologist from Design Studio. (refer Appendix 2 for detail) 11 m/m  
September 1988/July 1989
16. Mid-term tripartite review and technical evaluation with H.Q. participation, and visit of C.T.A. 1 m/m  
November/December 1988
17. Fellowship Programme (viii). 1 Chinese Technologist from Pilot Sewing Room. (refer Appendix 2 for detail) 6 m/m  
March/August 1989
18. Fellowship Programme (x). 1 Chinese Technologist from Marketing Service and Technical Information Unit. (refer Appendix 2 for detail) 6 m/m  
March/August 1989
19. Fellowship Programme (ix). 1 Chinese Technologist from Cutting Preparation Unit. (refer Appendix 2 for detail) 6 m/m  
March/September 1989
20. Fellowship Programme (xvi). The Director of TGIDC. (refer Appendix 2 for detail) 4 m/m  
March/July 1989
21. Study Tour C. 4 Chinese Technologists (refer Appendix 2 for detail) 4 x 4 m/m  
April 1989
22. Fellowship Programme (xii). 1 Chinese Technologist from Pilot Sewing Room. 6 m/m  
May/October 1989
23. Visit of C.T.A. to review progress and prepare PPER 2 m/w  
May 1989
24. PPER July 1989
25. Fellowship Programme (xiii). 1 Chinese Technologist from Testing Laboratory. (refer Appendix 2 for detail) 6 m/m  
July/December 1989
26. Fellowship Programme (xi). 1 Chinese Technologist from Design Studio (refer Appendix 2 for detail) 6 m/m  
Sept 1989/February 1990
27. Fellowship Programme (xiv). 1 Chinese Technologist from Testing Laboratory (refer Appendix 2 for detail) 6 m/m  
March/August 1990
28. Visit of C.T.A. 2 m/w  
March/April 1990
29. PPER July 1990
30. In depth tripartite evaluation followed by terminal tripartite review including H.Q. participation November/December 1990
31. Final visit of Chief Technical Adviser. Agency Terminal Report 1 m/m  
November/December 1990
32. Instal CAD Equipment unspecified
33. Fielding of CAD Expert unspecified



- |  |             |
|--|-------------|
| 34. Instal Sewing Room Equipment       | unspecified |
| 35. Field Sewing Room Expert           | unspecified |
| 36. Fielding of Design Expert          | unspecified |
| 37. Fielding of Training Expert        | unspecified |
| 38. Fielding of Quality Control Expert | unspecified |

In addition, the following activities will be undertaken by the Chinese Technical staff of the GTDC immediately on completion of each Study Tour and Fellowship Programme. The precise timings will be indicated in the Work Plan to be prepared by the Project Director and included in this Project Document at Appendix 1.

39. Conduct Briefing Seminars for:-
  - a. other staff from the same unit
  - b. staff from other units of GTDC.
40. Carry out liaison visits to factories in the Shanghai Economic Zone, to establish lists of priority activities.
41. Carry out research and development to meet departmental outputs (where applicable), as listed in Part II D.
42. Prepare teaching materials (in Chinese) ready for carrying out the training activities listed in Outputs.  
N.B. This may be accomplished with the assistance of the expatriate consultants.
43. Deliver training courses in accordance with the Work Plan prepared by the Project Director.
44. Carry out limited consultancy assignments in selected areas of specialisation.

2. UNDP INPUTS

11. <u>Personnel</u>	<u>Duration</u>	<u>Cost \$</u>
11-01 Chief Technical Adviser (6 visits)	4.25 m/m	51,000
11-02 Garment Design Expert	1 m/m	12,700
11-03 cad Expert (Travel & DSA only)	2 m/m	10,000
11-50 Garment Expert for Preparatory Assistance	1.4 m/m	17,206
15. <u>Local Project Travel</u>		1,220
16. <u>Mission Costs</u>		22,000
21. <u>Sub Contracts</u>		

Some of the Technology Input will be subcontracted as summarised below:-

(i) Garment Technology/ Management Specialist	5 m/m	
(ii) Garment Technology/ Production Engineer	7 m/m	
(iii) Quality Control Specialist	2 m/m	
(iv) Training Specialist	2 m/m	
(v) Unspecified input to be allocated by CTA later in project	3 m/m	
Total	19 m/m	

Draft Terms of Reference are included at Appendix 6. Total cost inclusive of travel, fees and per diem costs for 19 man months: 190,000

30. <u>Training</u>		
31.00 Individual Fellowships for 16 Technologists	97 m/m	298,200
32.00 Study Tours for a total of 17 staff (see Appendix 2)	12 m/m	96,192
40. <u>Equipment</u> (see Appendix 3)		544,000
51. <u>Miscellaneous</u>		
Unallocated amount to cover unforeseen costs and additional equipment as decided by the C.T.A. during subsequent visits.		57,482
<b>TOTAL</b>		<u>1,300,000</u>



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## PROJECT BUDGET/REVISION

3. COUNTRY CHINA	4. PROJECT NUMBER AND AMENDMENT DP/CPR/85/055	5. SPECIFIC ACTIVITY
10. PROJECT TITLE THE CHINA TEXTILE GARMENT TECHNOLOGY DEVELOPMENT CENTRE		

15. INTERNATIONAL EXPERTS (functional titles required except for line 11-50)	16. TOTAL		17. 1987		18. 1988		19. 1989		20. 1990	
	m/m	\$	m/m	\$	m/m	\$	m/m	\$	m/m	\$
11-01 CHIEF TECHNICAL ADVISER	4.25	51,000	.75	10,700	1.5	16,700	.50	6,900	1.5	16,700
GARMENT DESIGN EXPERT	1	12,700						12,700		
02 CAD EXPERT (TRAVEL & DSA ONLY)	2	10,000				10,000				
03										
04										
05										
06										
07										
08										
09										
10										
11										
12										
13										
14										
15										
16										
11-50 Short term consultants PREPARATORY ASSISTANCE	1.4	17,206								
11-99 Sub-total - International experts*	8.4	90,906								
21. REMARKS										

\* If more than 16 experts are required check here  and attach continuation sheet 1A. This sub-total must include all experts.



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PROJECT BUDGET/REVISION

4. PROJECT NUMBER	16. TOTAL		17. 1987		18. 1988		19. 1989		20. 1990	
	m/m	\$	m/m	\$	m/m	\$	m/m	\$	m/m	\$
OPAS EXPERTS (functional titles required)										
12-01										
12-02										
12-03										
12-99 Sub-total-OPAS experts <sup>b</sup>										
ADMINISTRATIVE SUPPORT PERSONNEL										
13-00 Clerks, secretaries, drivers										
13-50 Freedom interpreters (non-UNDP projects)										
13-99 Sub-total-Administrative support personnel										
UN VOLUNTEERS (functional titles required)										
14-01										
14-02										
14-03										
14-04										
14-99 Sub-total-UN Volunteers <sup>b</sup>										
15-00 Project Need		1,129		-		520		500		200
16-00 Other personnel costs (including UNIDO staff mission costs)		22,000		4,000		8,000		4,000		6,000
NATIONAL EXPERTS (functional titles required)										
17-01										
17-02										
17-03										
17-04										
17-05										
17-99 Sub-total-National experts <sup>b</sup>										
19-99 TOTAL-PERSONNEL COMPONENT										

<sup>b</sup> If additional individual budget lines are required, check here  and attach continuation sheet 1A. These sub-totals must include budget lines listed on page 1A.



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## PROJECT BUDGET/REVISION

4. PROJECT NUMBER	16. TOTAL		17. 1987		18. 1988		19. 1989		20. 1990	
	m/m	\$	m/m	\$	m/m	\$	m/m	\$	m/m	\$
<b>SUBCONTRACTS</b>										
21-00 Subcontracts	19	190,000		-	7	71,600	7	68,000	5	50,400
<b>TRAINING</b>										
31-00 Individual fellowships	97	298,200		-	51	154,600	40	125,100	6	18,500
32-00 Study tours: UNDP group training	12	96,192	5	40,080	3	24,048	4	32,064	-	-
33-00 In-service training										
34-00 Non-UNDP group training										
35-00 Non-UNDP meetings										
<b>39-99 TOTAL - TRAINING COMPONENT</b>	<b>109</b>	<b>394,392</b>	<b>5</b>	<b>40,080</b>	<b>54</b>	<b>178,648</b>	<b>44</b>	<b>157,164</b>	<b>6</b>	<b>18,500</b>
<b>EQUIPMENT</b>										
41-00 Expendable equipment										
42-00 Non-expendable equipment		544,000		20,000		524,000		-		-
43-00 Premises										
<b>49-99 TOTAL - EQUIPMENT COMPONENT</b>										
<b>MISCELLANEOUS</b>										
51-00 Sundries <b>UNALLOCATED</b>		57,482		-		-		30,000		27,482
55-00 Hospitality (non-UNDP projects)										
56-00 Support costs ICC and DC projects only)										
<b>59-99 TOTAL - MISCELLANEOUS COMPONENT</b>										
<b>SURPLUS/DEFICIT</b>										
61-00 Surplus/Deficit (ADM/FS use only)										
<b>99-99 PROJECT TOTAL</b>										
<sup>c</sup> COST SHARING (UNDP/IPF projects only)										
<sup>c</sup> NET UNDP CONTRIBUTION		1,300,000		74,780		809,468		279,264		119,282

<sup>c</sup> For information only - not for PAD input

PLANNED ACTIVITIES CHART

Appendix 1A

Activity No.	1987	1988	1989	1990
1	A	F	J	F
2	S	M	A	M
3	O	A	M	A
4	N	J	J	J
5	D	J	A	J
6		A	S	S
7		S	O	N
8		N	D	D
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Unspecified

STUDY TOURS AND FELLOWSHIP PROGRAMMES

1. STUDY TOURS

Three study tours are proposed. Each tour having a particular emphasis.

STUDY TOUR A - 5 persons for 4 weeks. Total 5m/m.

This tour should be for the senior staff of departments of GTDC and is intended as a general orientation tour.

The objective of the tour will be to observe/study advanced garment manufacturing methods and, where possible, the associated research and advisory service establishments and industrial training organisations.

The tour should:-

- a. Visit advanced garment factories to observe mass production methods in a variety of garments.
- b. Visit testing laboratories/research institutes.
- c. Visit factories where computer applications are in use in design, cutting, sewing room, stock control, production control and engineering, material transport systems, planning, accounts, sales and general administration.
- d. Observe Quality Control Systems.
- e. Visit major retailing outlets specialising in both made-to-measure and off-the-peg clothing to observe the variety/choice offered to the consumer.
- f. Visit an Industry Training Board (U.K)

Suggested countries - Japan, U.S.A., U.K., Sweden, France and Spain.

STUDY TOUR B - 3 persons for 4 weeks. Total 3m/m.

This tour should be for those people in the Design Studio who will not be following Fellowship Programmes.

The objective of the tour will be to expose the design staff to the overall design concept and illustrate how fashion designs are translated into production activities in an advanced garment industry.

The tour should:-

- a. Visit design studios, both high fashion and normal mass produced garments.
- b. Visit technical colleges/design colleges where design is taught.
- c. Visit factories and observe how designs are converted to patterns.

- d. Observe modern factory production methods.
- e. Visit establishments using Computer Aided Design (CAD) systems.
- f. Visit major retail stores to observe the range of styles and colours available.
- g. Visit a major national or international garment exhibition.

Suggested countries - France and Italy.

STUDY TOUR C - 4 persons for 4 weeks. Total 4 m/m.

This tour should be for those people from the Central Testing Laboratory and Computer Workshop who will not be following Fellowship Programmes.

The objective of the tour will be to observe testing and research methods as they are applied in advanced garment industries, and computer applications in the garment industry.

The tour should:-

- a. Visit Textile Testing Laboratories to observe methods and research into fibres, new yarns and fabrics; testing of fabrics and garments.
- b. Visit manufacturers of:
  - i. Threads - to observe 'sewability' tests.
  - ii. Ancilleries - buttons, zips, fasteners, etc.
  - iii. Interlinings - to observe modern production processes.
- c. Visit Standards Institutions to study establishment of standards for garments, labelling codes etc.
- d. Visit Computer Aided Design (CAD) studios.
- e. Visit factories using:-
  - i. Computerised Layplanning and Cutting equipment.
  - ii. Computerised Sewing machines.
  - iii. Computerised Finishing equipment.
  - iv. Computerised Warehousing.
  - v. Computerised Standard Time System (e.g. GSD or CSDS)
- f. Visit retail outlets with Computerised Stock Control to observe systems and also ranges of items available.

Suggested countries - U.S.A. and Japan.



2. FELLOWSHIP PROGRAMMES

Sixteen Fellowship Programmes are proposed, covering the areas of all the main activity units of the TGIDC.

FELLOWSHIP PROGRAMME (i) 1 person for 11 m/m/

Design Studio

The participant should:-

- a. Follow a full one year course in Fashion Design at a Fashion Institute or Design College.
- b. Spend some time (during college holidays) attached to the design department of a major factory.
- c. Study the production of patterns and size scales.
- d. Spend time working with CAD equipment.
- e. Have the opportunity to observe production methods in an advanced factory in order to fully understand the effects of good and bad design on advanced garment production.

Suggested countries - U.S.A. (FIT, or Parsons School of Design)  
U.K. (London College of Design or Hollings Faculty,  
Manchester Polytechnic)

FELLOWSHIP PROGRAMMES (vii) (xi) 2 persons for 6 m/m. Total 12 m/m.

Design Studio

Each participant should:-

- a. Be attached to the Design and Pattern Department of a major manufacturing unit.
- b. Study the production of patterns and size scales.
- c. Spend time working with CAD equipment.
- d. Study advanced factory production methods.

Suggested countries - U.S.A., U.K. or F.R.G.

FELLOWSHIP PROGRAMME (ii) 1 person for 6 m/m.

The participant should:-

- a. Study Computer Software writing.
- b. Be attached to an advanced garment factory to observe uses of CAD/CAM equipment.

Suggested countries - U.S.A, U.K.

FELLOWSHIP PROGRAMME (ix) 1 person for 6 m/m.

Cutting Preparation

The participant should:-

- a. Study Pattern Cutting and Pattern Grading at a Technical College or Design College, including Size Tables.
- b. Study Cutting Room Techniques at a Technical College.
- c. Study the use of CAD equipment at the equipment distributors/manufacturers.
- d. Spend some time in an advanced Cutting Room using CAD pattern and cutting equipment.
- e. Spend some time in an advanced factory studying advanced garment production techniques.

Suggested countries - U.S.A., U.K.

FELLOWSHIP PROGRAMME (iii) 1 person for 6 m/m.

Pilot/Experimental Sewing Room

The participant should:-

- a. Study Work Study (Production Engineering) in depth.
- b. Study computerised Pre-determined Motion Time Systems (PMTS) e.g. General Sewing Data (G.S.D)
- c. Study advanced garment production methods in an advanced factory, including finishing and packaging.
- d. Study construction analysis of garments at a Technical College/ Training Institution.
- e. Study equipment design and layout with machinery manufacturers, with particular attention to the use of Low-Cost Work Aids and simple machine attachments.
- f. Have an appreciation of the use of pneumatics.

Suggested countries - U.K. or F.R.G.

FELLOWSHIP PROGRAMME (viii) 1 person for 6 m/m.

Pilot/Experimental Sewing Room

The participant should:-

- a. Study in depth Garment Production Systems.
- b. Study in depth Garment Construction Analysis.
- c. Study equipment types and uses to enable judgement to be exercised in equipment selection.
- d. Study sewing threads, their construction, types and uses, including sewability characteristics.

- e. Visit thread manufacturers.
- f. Study modern Quality Control Systems.
- g. Study modern Management and Supervisory Training techniques.
- h. Visit advanced garment manufacturing factories.

Suggested countries - U.S.A. or U.K.

FELLOWSHIP PROGRAMME (xii) 1 person for 6 m/m.

Pilot/Experimental Sewing Room

The participant should:-

- a. Study the Training of Trainers, both Training Officers and Training Instructors, including Presentation Techniques, Visual Aids, use of video etc.
- b. Study the application of computers and advanced equipment design in all areas of the garment production industry.
- c. Attend a short (4 week) Work Study course to gain an appreciation of Work Study.
- d. Study Predetermined Motion Time Systems (P.M.T.S)
- e. Visit factories to gain an appreciation of advanced garment production techniques.
- f. Study Garment Construction Analysis.

Suggested countries - U.K. or U.S.A.

FELLOWSHIP PROGRAMMES (iv) (xiii) (xiv) 3 persons for 6 m/m. Total 18 m/m.

Central Testing Laboratory

The participant should:-

- a. Visit Textile Testing Laboratories/Research establishments.
- b. Study the testing of fabrics and ancillaries.
- c. Study research methods on new fibres, yarns and fabrics and visit cloth production units.
- d. Study fabric construction, particularly interlinings.
- e. Visit interlining manufacturers.
- f. Visit thread manufacturers to study thread construction, types and uses.

- g. Study sewability of fabrics and threads.
- h. Study international standards.
- i. Visit standards institutes.
- j. Study the system and use of labelling codes for garments including international codes for care of garments.

Suggested countries - U.S.A., U.K., West Germany.

FELLOWSHIP PROGRAMMES (v) (x) 2 persons for 6 m/m. total 12 m/m.

Marketing Service and Technical Information Unit

The participants should:-

- a. Visit Marketing Institutes.
- b. Study Public Relations, Communications and Advertising.
- c. Study statistics and statistical applications.
- d. Study the use of computers in Market Research/Analysis.
- e. Make liaison visits to establish working contacts and relationships with:-

Textile Research Institutes  
Garment Institutes  
Market Research Institutes  
Garment Manufacturers Associations  
Publishers of Textile and Garment Magazines  
Technical Libraries

Suggested countries - Japan, U.S.A., U.K., France, West German, Sweden, Singapore, Hong Kong.

1 person to visit U.S.A, Japan, Hong Kong, Singapore  
1 person to visit U.K., France, F.R.G., Sweden, Hong Kong.

N.B. The major part of this programme should be followed in one country, visiting the others on the way home for only a few days.

FELLOWSHIP PROGRAMME (vi) 1 person for 6 m/m.

Pilot/Experimental Sewing Room Mechanic

The participant should:-

- a. Study the repair and maintenance of a wide range of sewing machines, curring equipment and pressing equipment.
- b. Carry out in-plant practical project work in an advanced factory.
- c. Visit machinery manufacturers or distributors.

Suggested countries - U.K. (e.g. Trafford Park Skills Centre)  
F.R.G. returning via Japan.

N.B. The major part of this programme should be followed in the U.K. visiting FRG and Japan on the way home.

FELLOWSHIP PROGRAMME (xv) 1 person for 4 m/m.

Marketing Service and Technical Information Unit

The participant should:-

- a. Study Marketing at a recognised institute.
- b. Follow a short course in Business Studies.
- c. Study the application of computers in Business Administration, Market Research and the dissemination of Information.

Suggested country - U.S.A

FELLOWSHIP PROGRAMME (xvi) 1 person for 4 m/m.

This should be a special programme for the Director. It should be a short but intensive grounding in garment manufacturing. The Director should be attached to a Garment College.

The training should cover;-

- a. The principles of pattern construction.
- b. Stitches and Seam types.
- c. The principles of Layplanning and Cutting.
- d. Equipment types.
- e. Principles of Design.
- f. Garment Analysis.
- g. The principles of work measurement.
- h. Factory layout and Production methods.
- i. Distribution of finished garments.

Visits should be made to factories during this training.

Suggested countries - U.S.A. (FIT, New York)  
U.K. (Hollings Faculty of Manchester Polytechnic)

EQUIPMENT

A. GENERAL INFORMATION

In order for the GTDC to efficiently carry out its various functions, it must be adequately equipped. The Implementation Agency have already drawn up a list of intended purchases of Sewing, Cutting and Pressing equipment. This list was produced from advice given by representatives from industry and from equipment manufacturers. It covers a wide range of sewing equipment and, even though some equipment will not be in use on a regular basis, it will be required for demonstration and research purposes. Some of the items have been listed with a view to providing the Pilot/Experimental Sewing Room with a limited production capability.

The degree of sophistication of the equipment ranges from plan flat bed sewing machines with no attachments, through to electronically controlled equipment for special usage. The complete list is summarised in Section C.

In order to equip the GTDC fully, the UNDP input should provide items of appropriate high technology equipment, particularly in the Design and Cutting Preparation Units. In addition, some peripheral and ancillary items should be provided in order to make a complete, efficient model of modern Design and Cutting capability.

Certain items of computerised sewing equipment have already been purchased. It is intended that more should be obtained later in the project, when the buildings are completed and ready for occupation.

A suggested list of UNDP purchased equipment with general specifications is given in Section B.

B. EQUIPMENT TO BE PURCHASED FROM UNDP INPUT

1. Computer-aided-design, pattern and marker-making and cutting system

The equipment should incorporate the following features:-

- a. Garment Design System, which will allow the designer to sketch designs using stored colour and texture data, work out pattern details and calculate fabric usage.
- b. Pattern Design and Grading System, which will allow the Designer/Pattern Maker to construct patterns in the most accurate and least time-consuming way.
- c. Layplanning and Marker Making System, allowing the computer to work out lays to obtain the best fabric utilisation and then giving print-outs either full size or in miniature.
- d. Electronic Tailoring Measurement system using sophisticated measurement inputs into the computer in order to produce patterns for a tailor-made garment.
- e. Automated Cutting System capable of receiving cutting instructions from the main CAD computer. This part of the equipment should contain the following elements:-

- (i) Control Unit
- (ii) Software Package
- (iii) Cutting Head - minimum 7.5 cm cutting height
- (iv) Cutting Carriage
- (v) Cutting Table minimum 7 metres long with vacuum
- (vi) Communication interface to main computer system.

Suggested Target Price: \$496,000

2. One X Computer-based Standard Time Measurement System  
for preparing standard time data for newly established models as well as providing a service to industry by providing times for existing activities.

The system should include hardware and software for General Sewing data.

Suggested Target Price: \$3,000

C. OTHER MATERIALS TO BE BOUGHT FROM UNDP INPUTS

As one of the functions of the GTDC is to provide Technical Information to the industry, then some consideration must be given to establishing a Technical Resource Data Library to be operated by the Marketing Service and Technical Information Unit. The Technical Resource material should include:-

- a. Books
- b. Magazines
- c. Films
- d. Photographs
- e. Tape/Slide packages
- f. Videos and equipment
- g. Photocopying machine (\$4,000)
- h. Reprints of Research papers etc.

Suggested Target Price: \$25,000

D. TRANSPORT (Estate car/Station waggon)

Only one vehicle (minibus) has been provided from Government Inputs. Transport will be essential during the project period, commencing with the mission of the first expert, and continuing with the TGDC staff carrying out consultancy assignments.

Suggested Target Price: \$20,000

TOTAL UNDP MATERIALS AND EQUIPMENT INPUTS: \$20,000

E. EQUIPMENT TO BE PURCHASED FROM GOVERNMENT INPUTS

It is intended to purchase the equipment from a number of different sources and suppliers in F.R.G., Japan, U.K, U.S.A and Italy as well as PRC. Descriptions of the equipment are as follows -

<u>TYPE</u>	<u>QUANTITY</u>
1. Unit for automated runstitching of small parts with template control	1
2. High speed single needle lockstitch machine (various makes)	12
3. Single needle lockstitch machine with top and needle feeds, thread cutter and edge trimmer	1
4. High speed zig-zag lockstitch machine (of various types and makes)	8
5. Automatic pocket piping machine	2
6. Contour seamer work station (for sleeves, skirt and trouser side seams)	1

Remaining items as in the original document.



DRAFT TERMS OF REFERENCE

FOR SUBCONTRACTING THE TECHNOLOGY INPUTS OF  
THE ASSISTANCE TO THE GARMENT TECHNOLOGY DEVELOPMENT CENTRE

HANGZHOU, PEOPLES REPUBLIC OF CHINA

A. GENERAL BACKGROUND INFORMATION

The immediate objective in accordance with the project proposal is to establish a Garment Technology Development Centre, which will assist the regional industry of the Shanghai Economic Zone (comprising the provinces of Zhejiang, Jiangsu, Anhui and Jiangxi plus Shanghai City) and ultimately the national garment industry, in upgrading its performance by further diversifying its model ranges, economising its material consumption, improving its productivity and overall produce quality and training its technical staff.

In order to ensure the Centre's function to serve as a base for applied research and practical guidance in substantially upgrading China's national garment industry, the most up to date appropriate technology and equipment will be installed.

Building will commence in 1986. The final building plans are not yet complete but it is envisaged that the Centre, comprising a Design Studio, Cutting Preparation Service Unit, Pilot/Experimental Sewing Room, Central Testing Laboratory, Training Unit and Market Service and Technical Information Unit, with attendant Administration, will be housed in three main buildings on a site yet to be selected. In addition, dining, sports and bathing facilities will be added as well as staff accommodation.

B. THE AIM OF THE PROJECT

The overall objective of the project is to contribute to the Government policy to increase the standard of living of the people by improving the quality and degree of diversification of garments offered by the national garment industry.

There is an acute shortage of highly trained personnel in the garment industry. There has been little development in garment technology and modern factory production methods, and garment design is badly out of date.

The purpose of the new Centre will be to act as a focal point for the industry, initially in Shanghai Economic Zone but eventually nationwide, to promote and carry out research into new fabrics and trimmings, create new designs based upon international fashion trends, promote the introduction of modern factory management systems and advanced garment engineering, advise and assist in the introduction of high technology into the industry and provide services in consultancy, training and technical information.

C. RESPONSIBILITY OF THE CONTRACTOR, DESCRIPTION AND SCOPE OF WORK TO BE CARRIED OUT BY THE CONTRACTOR

Given the aims, objectives, project outputs and project activities as detailed in the project proposal, the Contractor shall undertake to supply the necessary expertise to ensure the timely implementation and satisfactory subsequent operation of the GIDC.

The experts provided by the Contractor shall undertake to advise and assist the staff of the GIDC in attaining a level of operation and competency whereby the immediate objectives can be achieved. The contractor's experts shall give whatever training is required to the Chinese counterpart staff and shall undertake to give whatever technical inputs are provided for by the external assistance component of the project proposal.

The contractor shall provide nineteen man-months of expertise over a period of four years in accordance with the activities section of the project document and the detailed Work Plan to be produced by the Project Director.

The fields of expertise required for the Contractor's inputs are outlined below. It may, however, be agreed that the contractor may compose the required specialities of short-term experts if this can be accommodated within the Work Plan and subject to approval by UNIDO.

- a. Garment Technologist/Garment Management Specialist  
(Initially 2 m/m to set up, and instruct Pilot Sewing Room Staff, and a further period as required)

To be responsible for ensuring that the Pilot/Experimental Sewing Room Equipment is laid out correctly to give the opportunity for research, demonstration and production to be carried out efficiently. Also to give instruction to P.E.S.R. staff in the use of equipment, ensuring that the most appropriate methods are used. Wide experience of the industry is necessary.

In addition, at a later date, to assist with the formulating and running of Garment Production Managers and Supervisors Training Courses. (See Appendix 4). Some institutional/training experience would be an advantage.

- b. Garment Technologist/Production Engineer (Work Study Officer)

Split mission. Initially 1 m/m to survey a section of the industry and draw up a Work Plan for the remainder of the mission. 6 m/m in 2 phases of 3 m/m to work with selected employees from designated factories, carrying out assignments to improve:-

Layout  
Work methods  
Work flow  
Line Balancing  
Productivity

in three of four factories, by introducing appropriate systems.

The expert should have a wide experience of the industry, and in addition, experience of PMTS systems (computerised PMTS would be advantageous). Some Training experience would be an advantage.

c. Quality Control Specialist: (unspecified period as required)

To be responsible for advising on Quality Control and assisting the staff of the Centre to draw up Quality Control procedures both for Centre-produced garments, and also to be offered to industry. The ability to carry out short duration, "trouble-shooting" consultancy assignments would be an advantage. A wide knowledge of all types of clothing is essential, as well as a good knowledge of International Standards and Labelling Instructions.

d. Training Specialist; (unspecified period as required)

To be responsible for advising the Training Staff of the GTDC on training matters, and in particular the Training of Operator/Instructors (see Appendix 4). To assist in the preparation and delivery of an Instructor course, if required. A good knowledge of Training, as it applies in the garment industry, is essential as is a good working knowledge of the industry.

D. GENERAL TIME SCHEDULES

The final time schedule will be completed by the Project Director as soon as more precise estimates are available for such things as equipment supply and building completion/availability. The following tentative schedule is applicable for contract negotiations.

1. Briefing of consulting company representative in Vienna for three days, to take place approximately six weeks before fielding the first expert.
2. Fielding of Garment Technology/Production Engineer - January 1988.
3. Fielding of remaining consultants/specialists as required in accordance with the progress of the project.

An estimate of the man-months for each specialist might be:

Garment Technologist/Management Specialist	5 m/m
Garment Technologist/Production Engineer	
(1 m/m + 3 m/m + 3 m/m) =	7 m/m
Quality Control specialist	2 m/m
Training specialist	2 m/m
Unspecified time to be allocated by CTA	3 m/m
TOTAL	19 m/m

4. Each individual expert is expected to prepare a work plan and provide UNIDO with a report within one month of completion of each specialised activity.

E. LANGUAGE

The language requirement for the consultants is English. Some knowledge of Chinese would be an advantage, but is not essential. All reports and communications should be in the English language.

APPENDIX 7

JOB DESCRIPTIONS

GARMENT DESIGNER & CAD EXPERT

The attached Job Descriptions are for individually recruited experts. The CAD expert may be recruited from the company supplying the CAD equipment.

## JOB DESCRIPTION

DP/CPR/85/055/11-02

- Post Title:** Garment Design Expert
- Duration:** 1.0 man-month
- Date required:** 1989. Precise date to be arranged by CIA by end of 1988.
- Duty Station:** Hangzhou
- Purpose of project:** To establish a Textile Garment Technology Development Centre (TGIDC) which will assist the national garment industry in upgrading its performance by further diversifying its model ranges, economising its material consumption, improving its productivity and overall product quality, enhancing its flexibility to the market, and training its technical staff. The TGIDC will also carry out and/or organise research and development activities in garment manufacturing technology and new fabrics, ancillary materials and trimmings.
- Duties:** The expert will be assigned to the Textile Garment Technology Development Centre of the Ministry of Textile Industry to assist the local staff. In consultation with the National Project Director, UNIDO and the Chief Technical Advisor, the expert will be specifically expected to:
- advise on the layout, equipment and materials required in a modern design studio.
  - assist local staff in planning out seasonal design activities.
  - inform local staff about current designs of a wide range of mens, womens and childrens outerwear.
  - give some lectures to representatives from industry on the subject of design.
- Qualifications:** Designer with a wide experience in a modern progressive garment industry. It would be advantageous to have experience in Computer Aided Design (CAD) equipment. Previous experience in institution work or in technical education would be an advantage. The expert must be able to communicate his/her ideas by lecture.
- Language:** English.

## JOB DESCRIPTION

DP/CPR/85/OSS/11-03

- Post Title:** Computer Aided Design (CAD) Equipment expert.
- Duration:** 2.0 man-months
- Date required:** Second half of 1988 (to coincide with arrival of CAD equipment).
- Duty Station:** Hangzhou
- Purpose of project:** To establish a Textile Garment Technology Development Centre (TGIDC) which will assist the national garment industry in upgrading its performance by further diversifying its model ranges, economising its material consumption, improving its productivity and overall product quality, enhancing its flexibility to the market, and training its technical staff. The TGIDC will also carry out and/or organise research and development activities in garment manufacturing technology and new fabrics, ancillary materials and trimmings.
- Duties:** The expert will be assigned to the Textile Garment Technology Development Centre of the Ministry of Textile Industry to assist local staff. In consultation with the National Project Director, UNIDO and the Chief Technical Advisor, the expert will specifically be expected to:
- ensure the CAD equipment is correctly installed.
  - give training to the staff of the TGIDC in the correct use of the equipment.
  - give lectures to representatives from the industry on the applications of CAD equipment in a modern garment industry.
- Qualifications:** A CAD expert with wide experience in the garment manufacturing industry. A knowledge of Cutting Room Techniques, computerised PMTS systems would be advantageous, as would some experience of Training.
- Language:** English.



