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25 February 1988
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STRENGTHENING OF THE CHINA DYEING AND FINISHING DEVELOPMENT CENTRE

DG/CPR/85/056/11-01A

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 George W. Madaras
Chief Technical Adviser

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United Nations Industrial Development Organization
Vienna

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ABBREVIATIONS

ACMAS	-	Automation, Control and Micro-Processor Application Section
BASF	-	Badische Anilin u. Soda Fabrik, Ludwigshafen, FRC.
BRD	-	Bundesrepublik Deutschland
CDFDC	-	China Dyeing and Finishing Development Centre
CHT	-	Chemische Fabrik Tübingen
CTA	-	Chief Technical Adviser
DCAS	-	Development of Chemicals and Auxiliaries Section
DPPD	-	Department for Programme and Project Development
FRG	-	Federal Republic of Germany
ID	-	Information Department
IR	-	Infra Red
NPD	-	National Project Director
PDS	-	Product Development Section
PE/Co	-	Polyester/Cotton
PP	-	Pilot Plant
PRC	-	People's Republic of China
R & D	-	Research and Development
RDD	-	Research and Development Department
SI	-	Shirley Institute
STRI	-	Shanghai Textile Research Institute
TA	-	Technical Assistance
TD	-	Training Department
TRS	-	Technology Research Section
UK	-	United Kingdom
UNDP	-	United Nations Development Programme

I SUMMARY

The purpose of the mission (17 January 1988 to 6 February 1988) was the implementation of the Assignment of International Experts in close collaboration and agreement with the National Project Director and his staff to further the Project "Strengthening of the China Dyeing and Finishing Development Centre (CDFDC) (DG/CPR/85/056)".

Agreement was reached on the Names of the International Experts and Dates and Duration of their appointments. The job descriptions, as set out in Annex IIIa of the Project Document, were amended as necessary.

It is recommended that the experts identified are approached to ascertain their willingness to undertake the various missions; experts in (i) Fabric Preparation and (ii) Technical Information Systems to be approached as soon as possible, as their missions are scheduled for (i) May/June 1988* and (ii) November/December 1988 respectively.

*For update see VI. p.17.

II INTRODUCTION

The China Dyeing and Finishing Development Centre (CDFDC), with the approval of the State Economic Commission, was established on 4 April 1984 in Shanghai and placed under the authority of the Ministry of Textile Industry. The organizational structure of CDFDC and its linkages to governing and co-operating bodies are described in Annex Ib in the Project Document DP/CPR/85/056. The Ministry mandated the Centre as its principal national centre to carry out Research and Development (R & D) into new processing technology in dyeing, printing and finishing, assist the industry in implementing new processes, and provide technical assistance (TA) to the industry on current processing and quality problems.

Based in Shanghai, where nearly 20 dyeing, printing and finishing works are located and where a great deal of experience and know-how exist, in particular at the Shanghai Textile Research Institute (STRI), the new Centre's sphere of activity and influence is intended to extend to all the textile research and development institutes and industry in the whole country.

In 1985 the Ministry of Textile Industry of the People's Republic of China (PRC) applied for UNDP/UNIDO assistance for the establishment and for the strengthening of CDFDC.

Four Objectives are listed in the Project Document "Strengthening of the China Dyeing and Finishing Development Centre", signed on behalf of the Government of the PRC on 14.8.1987 and on behalf of UNDP on 4.9.1987. These are:

(a) Strengthening the Research and Development Department (RDD) consisting of four specialized sectors:

- (i) Technology Research Section (TRS)
- (ii) Development of Chemicals and Auxiliaries Section (DCAS)
- (iii) Product Development Section (PDS)
- (iv) Automation, Control and Micro-Processor Application Section (ACMAS)

(b) Establishing a Pilot Plant (PP), capable of:

- (i) developing production-scale processing procedures for processes developed by the Sections of the RDD;
- (ii) providing development facility services for the STRI and to industrial mills, etc.;
- (iii) providing training facilities for the trainees placed by TD of CDFDC.

(c) Establishing a Training Department (TD) for demonstration and systematic training of mill technicians in applying techniques developed at the CDFDC.

(d) Establishing an Information Department (ID) to collect and distribute technical information and documentation on preparation, dyeing, printing and finishing.

The **OUTPUTS** of the above four units are described in *extenso* on pages 5-11 of the official Project Document with references to the work of **International Experts (Annex IIIa)**; to the arranging and training of **Fellowships (Annex IIIc)**; and the planning of **Study Tours (Annex IIIb)**.

Likewise, amongst the **ACTIVITIES** listed on pages 11-14 of the official Project Document, frequent references are made to the work of **International Experts (Annex IIIa)**, **Fellowships (Annex IIIc)**, and **Study Tours (Annex IIIb)**.

Yet in a "**LETTER OF AGREEMENT**" BETWEEN THE GOVERNMENT OF THE PEOPLE'S REPUBLIC OF CHINA AND UNITED NATIONS INDUSTRIAL DEVELOPMENT ORGANIZATION signed by (i) the representative for the Government of the People's Republic and the Director of the China International Centre for Economic and Technical Exchanges on 14.8.1987 on the one hand, and by (ii) Mr N.W. Tandon, Director, Area Programmes Division, DPPD, on behalf of UNIDO on 21.9.87 on the other, the **UNIDO INPUT** is limited to the "**Provision of Consultant Services (International Experts) with a total term of 15 man/months**".

Mr Zhou Wei-Tao, NPD and Vice-Director of CDFDC, after asking the Ministry of Textile Industry, the China International Centre for Economic and

Technical Exchanges and UNDP, quickly ascertained that the above 'LETTER OF AGREEMENT' was the correct working document which applied to the CTA's first mission.

The first mission of the CTA started on 17th January, 1988, and was completed on 6th February, 1988. The actual period spent in Shanghai was from 20th January to 3rd February, 1988. It included two days briefing and debriefing at UNIDC, Vienna.

The revised objectives of the work to be performed by the Co-Operating Agency, i.e. UNIDO, viz., the Provision of Consultant Services (International Experts) as described in Attachment 1 of the LETTER OF AGREEMENT, have been achieved to the satisfaction of the NPD of the CDFDC and the CTA.

III RECOMMENDATIONS

1. It is recommended that the Schedule of the Missions of the CTA and the SIX International Experts, as agreed between the NPD and the CTA, is adhered to. (See V. Revised Work Plan and VA. Bar Chart.)

2. It is recommended that the Experts identified for:
 - 2.1 Expert in cotton and cotton blends (PE/Co) Preparation - DG/CPR/85/056/11 - 02/31.7.B
 - 2.2 Expert in Technical Information Systems - DG/CPR/85/056/11 - 04/31.7.B
 - 2.3 Expert in Textile Dyeing - DG/CPR/85/056/11 - 07/31.7.B
 - 2.4 Expert in Finishing and Coated Fabrics - DG/CPR/85/056/11 - 06/31.7.B
 - 2.5 Expert in Textile Printing - DG/CPR/85/056/11 - 03/31/7/B
 - 2.6 Expert in Product Development of Textiles - DG/CPR/85/056/11 - 05/31.7.Bare approached by UNIDO in order of priority agreed between the NPD and the CTA (see V. Revised Work Plan).

3. The CTA was asked to provide all possible help to achieve the objectives of the project "The Strengthening of the China Dyeing and Finishing Development Centre" as set out in the official Project Document, but UNIDO cannot accept responsibility for actions not covered by the 'LETTER OF AGREEMENT'.

IV ACTIVITIES AND OUTPUT

The primary objective of the CTA's first mission was to agree with the NPD:

1. The job descriptions and duties of the CTA and the six consultants as listed in the 'LETTER OF AGREEMENT' between the Government of the PRC and UNIDO. (Attachment 2.)
2. The duration and duties of their missions.
3. The identification and availability of consultants of high calibre.

In the following pages the above information is detailed for the CTA and the six consultants (International Experts) in chronological order of the agreed dates of their missions. For the Revised Work Plan and Bar Chart see Chapter V. and VA. For the Names of Experts see Chapter VI.

IVa. JOB DESCRIPTION
DG/CPR/85/056/11-01A/J-13102

Post title Chief Technical Adviser/Expert in Textile Dyeing and Finishing

Duration 4.4 m/m (first mission: 0.7 m/m),
 17 January - 6 February 1988
 (second mission: 1.5 m/m) November/December 1988
 (third mission: 1.5 m/m) August/September 1989
 (fourth mission: 0.7 m/m) October/November 1990

Date required 1988/1989/1990

Duty station Shanghai with limited travel within the country

Purpose of project The strengthening of the China Dyeing and Finishing Development Centre (CDFDC)

Duties In close co-operation with the National Project Director the Chief Technical Adviser (CTA) will

- draft a workplan for the project reflecting the activities required;
- finalize job descriptions for international experts;
- identify and agree on names of suitable international experts;
- review the programme for applied research for each unit of CDFDC;
- prepare mid-term and final tripartite meetings.

The CTA will also be expected to prepare a technical report setting out the findings of the mission and recommendations to the Government on further action which will be taken.

Qualifications Expert in textile dyeing and finishing with both industrial and research experience.

Language English

Background information See separate sheets. p 9, 10, 11, 12.

**BACKGROUND
INFORMATION**

The People's Republic of China (CPR) is one of the world's largest producers of textiles. Traditionally the industrial capacity was based on the national supply of cotton, sufficient to meet the basic needs of its vast population. The establishment of a national synthetic fibre industry in the past 5 years has contributed to a significant increase of the total fibre supply, allowing the textile industry to meet the fast growing domestic demand as well as the challenging export market. The availability of a vast range of fibres and fibre blends, however, required the adaptation of various dyeing, printing and finishing techniques previously not fully known, or not widely practised in China.

There appeared also a number of new, up-to-date processes not only for the new fibres, but also for the chemical treatment/finishing of traditional cotton fabrics, imparting such desirable properties as easy-care, crease resistance, wash- and wear etc.

Although significant progress has been made in China in applying these modern technologies, acceleration of their applications is needed to prevent further widening of the technology gap. Furthermore, China feels it is capable of developing new types of specialized and high-grade finished fabrics for various purposes. Its industry also needs to develop a capability to design dyed and printed fabrics for the international market scene, and above all to control its processing to ensure reliable quality of its final products at an internationally acceptable level. In particular, upgrading the technology for high quality apparel fabrics, decorative fabrics and technical fabrics requires the highest priority.

Although there are many research and development institutions in China, thus far there has been no overall research

and development capability in the field of textile wet processing, i.e. preparation, dyeing, printing and finishing.

In order to fill this gap, and serve a significant sector of the textile industry, the China Dyeing and Finishing Development Centre (CDFDC), by approval of the State Economic Commission was established on 4 April 1984 in Shanghai and put under the authority of the Ministry of Textile Industry. At the same time a Council of CDFDC, acting as Technical Committee to determine the research policy for the Centre was brought to life, with the Deputy Minister of the Textile Industry as chairman, the Adviser of Shanghai Municipal Economic Commission and the Vice-Director of the Scientific and Technical Bureau of the Ministry of Textile Industry as Deputy Chairman, and the Deputy Director of Shanghai Textile Industry Bureau as Secretary General.

The 17 members of the Council come from all sectors of Government, industry and academic institutions. The Ministry mandated the Centre, as its principal national centre, to carry out research and development of new processing technology in dyeing, printing and finishing; assist the industry in implementing new processes, and provide technical assistance to industry on current processing and quality problems.

Based in Shanghai where nearly 20 dyeing, finishing and printing factories are in operation and where a concentration of know-how exist in particular at the STRI, the new Centre's sphere of activity is intended to extend to all the textile research and development institutes and industry in the whole country.

Description of the project

The CDFDC operates at present using the premises and facilities of the Shanghai Textile Research Institute. In a new building completed for STRI, in June-July 1986, two floors - with a total area of approximately 1,200 m² - have been made available to CDFDC for offices, classrooms etc. and further rooms in the existing building of STRI for laboratories.

In addition another building with an area of 2,500 m², with potential for further enlargement will be built, as part of the government input, viz. for the Pilot Plant.

The site of the building has been selected and planning of the construction has started.

The CDFDC will use the facilities of STRI - library, laboratories, special instruments, services of specially trained staff as well as engineering services, supplies, storerooms etc. - according to the co-operation agreement between STRI and CDFDC, regulated by the Charter of CDFDC approved by the Ministry of Textile Industry.

The CDFDC has at present a technical staff of about 40: one director, 4 vice-directors, 6 senior engineers, 10 engineers, and 26 assistant engineers, 5 clerical staff and drivers, most of whom, for the time being, have other responsibilities as well. Accordingly, substantive work is to a great extent in a preliminary stage. Some research work has been started in the field of dyeing (fixing of reactive dyes, one bath reactive disperse dyeing), and finishing (weft diagonal distortion of fabrics, special chemical finishing: flame retardant, antibacterial, coating). A comprehensive research and development programme will be prepared in the very first stage of the project.

By the completion of the project CDFDC will have a staff of around 90: one director, 4 vice-directors, 12 senior engineers, 20 engineers and assistant engineers, 9 clerical staff and 30-40 workers in the pilot plant. The activities will cover a wide range of research and development work in the field of textile wet processing. Most of the substantive staff will receive additional training in the course of the project, in the form of study tours, fellowships, and consultations and seminars etc. by international experts.

The services of CDFC will enable dyeing and finishing factories to improve their production methods; increase efficiency in the utilization of materials, energy and man-power; develop new products with improved aesthetic and/or technical properties: thereby strengthening the market positions of the textile dyeing and finishing industry, and fulfilling the aims expressed in the objectives of the project.

Textile wet processing, i.e. the preparation, dyeing, printing and finishing of fabrics is unique in the sense that although the processes themselves are of a chemical or physio-chemical nature, the mechanical behaviour of the textile substrate during processing is of utmost importance.

IVb. JOB DESCRIPTION
DG/CPR/85/056/11-02/31.7.B

Post title	Expert in cotton and polyester/cotton preparation
Duration	One month.
Date required	May/June 1988
Duty station	Shanghai with limited travel within the country
Purpose of project	The strengthening of the China Dyeing and Finishing Development Centre
Duties	<p>The expert in cotton and polyester/cotton preparation will</p> <ul style="list-style-type: none"> - survey the technical level of desizing, scouring, bleaching and mercerizing in some representative dyeing/printing factories; - review research work conducted in the field of preparation of cotton and cotton/polyester fabrics and advise on the research programme in this field at the CDFDC; - give technical advice on problem solving in research and application; advise on production problems in scouring, bleaching and mercerizing; - conduct a seminar for research workers and high level technical personnel from factories in the theory and practice of preparation processes. <p>The expert will also be expected to prepare a technical report setting out the findings of the mission and recommendation to the Government on further action which will be taken.</p>
Qualifications	Textile chemist with high level industrial and research practice of the preparation of cotton and polyester/cotton blends.
Language	English
Background information	As in job description of post 11-01A (p.9 et seq.).

IVc. JOB DESCRIPTION
DG/CPR/85/056/11-04/31.7.B

Post title Expert in technical information systems

Duration 1 month

Date required November/December, 1988

Duty station Shanghai with limited travel within the country

Purpose of project The strengthening of the China Dyeing and Finishing Development Centre.

Duties The expert in technical information systems will

- review the progress at CDFDC in mastering the utilization of the data processing system;
- establish links with an international data base;
- instruct the staff of CDFDC in the optimal use of the system.

The expert will also be expected to prepare a technical report setting out the findings of the mission and recommendation to the Government on further action which will be taken.

Qualifications Expert in electronic data processing, with experience in the organization and utilization of technical information systems. Familiarity with textile wet processing an asset.

Language English

Background information As in job description of post 11-01A.

IVd. JOB DESCRIPTION
DG/CPR/85/056/11-07/31.7.B

Post title	Expert in textile dyeing
Duration	1 month
Date required	April/May 1989
Duty station	Shanghai with limited travel within the country
Purpose of project	The strengthening of the China Dyeing and Finishing Development Centre.
Duties	<p>The expert in textile dyeing will</p> <ul style="list-style-type: none"> - demonstrate the utilization of jiggers and jet dyeing machines with micro-processor control in producing small lots with high reproducibility; - give technical advice on the use of computer-controlled weighing systems; - conduct course/lecture on <ul style="list-style-type: none"> (i) the factors affecting reproducibility in textile dyeing, with particular reference to the compatibility of dyes, (ii) the application of colour measurement and computer colour matching in the dyehouse. <p>The expert will also be expected to prepare a technical report setting out the findings of the mission and recommendations to the Government on further action which will be taken.</p>
Qualifications	Textile chemist with high level theoretical and practical knowledge of dyeing technology, computerized colour matching and familiarity with process control and computerized dye kitchen.
Language	English
Background information	As in job description of post 11-01A.

IVe. JOB DESCRIPTION
DG/CPR/85/056/11-06/31.7.B

Post title Expert in textile finishing and coated fabrics

Duration 1 month

Date required August/September, 1989

Duty station Shanghai with limited travel within the country

Purpose of project The strengthening of the China Dyeing and Finishing Development Centre

Duties The expert in textile finishing and coated fabrics will

- demonstrate the utilization of laboratory and pilot plant finishing and coating machines in developing new products for apparel, decoration and technical outlets;
- conduct a seminar on the latest technology and machinery for the production of coated fabrics;
- give technical advice on research work to be pursued in this field.

The expert will also be expected to prepare a technical report setting out the findings of the mission and recommendation to the Government on further action which will be taken.

Qualifications Textile chemist with extensive industrial experience in textile finishing and in the production development of coated fabrics.

Language English

Background information As in job description of post 11-01A.

IVf. JOB DESCRIPTION
DG/CPR/85/056/11-03/31.7.B

Post title Expert in textile printing

Duration 1 month

Date required April May, 1990

Duty station Shanghai with limited travel within the country

Purpose of project The strengthening of the China Dyeing and Finishing Development Centre.

Duties The expert in textile printing will

- assess research work conducted at the CDFDC in the field of printing cotton and polyester/cotton fabrics;
- advise on the line of research to be pursued;
- conduct a course for research workers and high-level technical staff from factories in up-to-date printing techniques;
- give technical advice in product development of high quality, fashionable printed textiles for apparel and decoration outlets.

The expert will also be expected to prepare a technical report setting out the findings of the mission and recommendation to the Government on further action which will be taken.

Qualifications Textile chemist with extensive experience in textile printing technology and design.

Language English

Background information As in job description of post 11-01A.

IVg. JOB DESCRIPTION
DG/CPR/85/056/11/-05/31.7.B

Post title Expert in product development of textiles.

Duration 1 month

Date required April/May, 1990

Purpose of project The strengthening of the China Dyeing and Finishing Development Centre

Duties The expert in product development of textiles will

- demonstrate the utilization of laboratory and pilot equipment in the product development of high quality fabrics made of
 - (a) texturized polyester
 - (b) polyester/cotton blends
 - (c) cotton
 - (d) synthetics;
- conduct a workshop on methods of product development in the textile industry.

The expert will also be expected to prepare a technical report setting out the findings of the mission and recommendation to the Government on further action which will be taken.

Qualifications Textile chemist or textile engineer with extensive experience in the product development of high quality apparel fabrics.

Language English

Background information As in job description of post 11-01A.

V. REVISED WORK PLAN

Project No. DG/CPR/85/056/F/01/99

Post/Title	Ref.	Duration	Date Required
Chief Technical Adviser	DG/CPR/85/056/11-01A/J-13102	i) 0.7 m/m	17 Jan.1988 - 6 Feb.1988 (accomplished)
		ii) 1.5 m/m	Nov. - Dec. 1988
		iii) 1.5 m/m	Aug. - Sept.1989
		iv) 0.7 m/m	Oct. - Nov. 1990

Experts in:

Preparation of Cotton and Cotton Blends	DG/CPR/85/056/11 - 02/31/7.B	1 m/m	May - June 1988
Technical Information Systems	DG/CPR/85/056/11 - 04/31.7.B	1 m/m	Nov. - Dec. 1988
Textile Dyeing	DG/CPR/85/056/11 - 07/31.7.B	1 m/m	Apr. - May 1989
Textile Finishing and Fabric Coating	DG/CPR/85/056/11 - 06/31.7.B	1 m/m	Aug. - Sept.1989
Textile Printing	DG/CPR/85/056/11 - 03/31.7.B	1 m/m	Apr. - May 1990
Product Development of Textiles	DG/CPR/85/056/11 - 05/31.7.B	1 m/m	Apr. - May 1990

VI. NAMES AND ADDRESSES OF EXPERTS

<u>CODE</u>	<u>NAME OF EXPERT</u>	<u>AFFILIATION</u>	<u>ADDRESS AND TELEPHONE NUMBER</u>
11-02	Dr H.E. Bille*	Retired, ex-BASF (Ludwigshafen)	Eckhoff Strasse 1B. D-6703 Limburgerhof, Pfalz. FRG (BRD). 06236-8103.
PREPARATION	Mr Kenneth Dickinson	Retired, ex-Interon Chemicals	9 Farrocks Way, Moss, South Wirral, 664 4EW, UK. 051-336 7345
	Mr B.C. Burdett	Shirley Institute	Didsbury, Manchester. M20 8RX, UK. 061-445 8141
<hr/>			
11-04	EXPERT TO BE HIRED BY UNIDO FROM ORGANIZATION USING TITUS		
INFORMATION SERVICES			
11-07	Dr W. Beckmann*	Bayer AG., Leverkusen	Leverkusen-Bayerwerk, D-5090 Leverkusen, FRG (BRD) 0214-30 11283
DYEING	Mr John Shore	Retired; ex-ICI (Manchester).	Shirley Institute, Didsbury, Manchester, M20 8RX, UK. 061-445 8141.
	Mr W.J. Marshall	Retired; ex-ICI (Manchester).	1 Barnside Way, Tytherington, Macclesfield, SK13 2TZ, UK. 0625-29593
<hr/>			
11-06	Ir. Jan Jongbloet*	Vetex NV., Courtrai	Veld Street 71, Courtrai, Belgium. 056-220307.
Finishing and Coated Fabrics	Dr H.E. Bille * David Dykes (PU expert)	See above. British Vita, plc	Souden Street, Middleton, Manchester, UK 061-643 1133
	Dr J.G. Roberts * David Dykes (PU expert)	Shirley Institute. See above	Didsbury, Manchester, M20 8RX, UK 061-445 8141
	Mr Roy Parkinson * David Dykes (PU expert)	BASF UK Ltd., Cheadle Hulme See above.	Earl Road, Cheadle Hulme, Cheadle, Stockport, UK. 061-485 6222
<hr/>			
11-03	Mr L.W.C. Miles*	UNIST, Manchester	PO Box 88, Manchester, M60 1QD, UK. 061-236-3311
Printing	Mr R. Wylie	Laura Ashley plc	Cerno, Powys, Wales. 0686-24050
	Mr K.A. Hilton	Retired; ex-Alginete Industries	8 Grangolands, Prestbury Road, Macclesfield, SK10 4AB, Cheshire 0625-28460
<hr/>			
11-05	Mr John Gordon*	Shirley Institute	Didsbury, Manchester, M20 8RX, UK. 061-445 8141
Product- Development	Mr R.W. Bellfield	Rigby & Nelson, Worsley	P.O. Box 3, Manchester Road, Walkden, Worsley, M28 5WR, 062-790 4851

* Preferred Expert.

" Available September, 1988.

VII. REQUESTED ADDITIONAL ACTIONS NOT COVERED BY LETTER OF AGREEMENT

At an early stage in the discussions between the NPD and the CTA, it was realized that the Activities and Output requested from the CTA as laid down in the Project Document "Strengthening of the China Dyeing and Finishing Development Centre" on the one hand and the "Letter of Agreement" on the other, both signed by the Government of the PRC and UNIDO, were at variance. (See II. INTRODUCTION.)

Nevertheless, the CTA agreed to the NPD's request to work according to the spirit and letter of the Project Document, whilst clarification was being sought by the NPD from the Ministry of Textiles at Beijing, the China International Centre for Economic and Technical Exchanges at Beijing, and UNDP.

On Saturday, 30 January the NPD informed the CTA that the "Letter of Agreement" was the official working document, but he asked the CTA for his continued help and cooperation on the topics listed under VIIA-D. This request was acceded to because it was felt that without the CTA's involvement in the above four topics the Objective "The Strengthening of the China Dyeing and Development Centre" might be further delayed. It was explained, however, that the CTA was acting in his personal capacity and UNIDO, whilst not discouraging the CTA from this course of action, would neither accept responsibility for any advice given by the CTA nor for any actions ensuing from them.

VIIA. STUDY COURSES

Since the setting up of the CDFDC, two study tours have taken place.

Report No.1: dated December, 1986, was a "General Identification Study Tour"; a high-powered delegation consisting of five executives visited dyeing and printing factories, machinery manufacturers, dye and chemical manufacturers, textile instrument and apparatus manufacturers and research institutes in Japan, UK and Austria.

Report No.2: The "First Technical Study Tour" covered the period 19 October 1987 to 15 November 1987 and included senior staff from the CDFDC led by Mr Zhou Wei Tao and Mr Xie Zhaoyue, Director of the Technical Division of the Ministry of Textile Industry. The delegation's primary aim was to visit the International Textile Machinery show (ITMA) held in October 1987 in Paris. Whilst abroad, the delegation also visited dyeing and printing works, as well as machinery manufacturers in France, Italy and Hong Kong. The report describing the study tour is dated December 1987 and is issued by the China Dyeing and Finishing Development Centre.

CDFDC intends to send a delegation to the American Textile Machinery Exhibition - International (ATME-I) to be held in Greenville, S.C., in October, 1988. The CTA has been asked for the address of the American Textile Machinery Association (ATMA), together with names of contacts, so that an official invitation can be sent by ATMA to the CDFDC for a delegation to visit this year's show. This information has been obtained and sent to the NPD's Assistant.

The CTA was also asked to make suggestions for the delegation to visit selected dyeing, printing and finishing works in the USA and Canada. A list of such firms, together with addresses and name of person to contact, has been compiled and sent to the NPD's Assistant.

Likewise, assistance was asked for in selecting suitable American Textile Machinery manufacturers which the delegation could visit. Suggestions for such visits, i.e. names and addresses of manufacturers, have also been forwarded to the NPD's Assistant.

VIIB. FELLOWSHIPS

According to the revised Work Plan of the official Project Document eight fellowships will be awarded in the duration of the Project (3½ years). One fellow will soon take up an appointment at Hamburg University (FRG), under Professor Russbach. The other has been placed at S.I., Manchester, UK. He will be working with Dr J.R. Holker on studies in polyurethane chemistry. The CTA agreed to keep a watching brief on Mr Cai Zhong Fang, a vice-director of CDFDC during his 10-month stay at S.I. A third fellow is available to be sent abroad and two more are studying English at a language school.

The CTA was asked for advice and help in placing Fellow No. 3, possibly at a technician's course laid on by leading dye manufacturers, e.g. ICI, Ciba-Geigy, Sandoz, BASF., Bayer, Hoechst, and preliminary enquiries have already been made. The CTA promised to keep the NPD apprised of any positive developments.

VIIC. PILOT PLANT

An essential and vital component of the successful outcome of the Project "Strengthening of the China Dyeing and Finishing Development" is the creation of an up-to-date pilot plant. The 'Justification of the Pilot Plant' is set out on p.5 of the official Project Document and further details of equipment and staffing are given on p.9 of the same document.

Yet for apparently economic, administrative and possibly other as yet unexplained reasons, the UNIDO input into the realization of this vital part of the Project has been shelved; certainly the 'Letter of Agreement' i.e. the present working document, makes no reference to any UNIDO involvement.

Under the circumstances, the CTA, acting in a purely private capacity, spent about $\frac{1}{2}$ a day discussing the lay-out and floor plan of the projected building with the NPD and his staff.

The present position is that CDFDC has bought a plot of land, approx. 2500 m² on the east side of the Huangpu river. The planning and design stage is well advanced; it will be a ground floor building with two continuous preparation lines - one for rope, the other for open-width processing. A continuous dyeing line: pad - I.R. predry - thermosol - pad - steam (for disperse/reactive dyeing of PE/co blends) is envisaged, but shelved for the time being due to lack of funds. Instead, the usual batch dyeing machinery will be installed (180 cm. wide) including a Spanish ATYC-overflow jet dyeing machine (500 kg capacity); it is also planned to install pressure jigs, which in Europe are considered obsolete. Amongst finishing machinery, a baking (curing) oven, a calender, a compressive shrinkage machine etc., were identified on the floor-plan. The printing line too is being shelved for the time being owing to a shortage of funds.

It is envisaged that site clearance, provision of services and laying the foundations can start in July, 1988, and the building is scheduled for completion 12 months later. In the second half of 1989, the installation of machinery and ancillary equipment is envisaged, followed by commissioning, so that by mid-1990 those sections of the PP for which funds have been allocated will be operational.

VIID. RESEARCH INVESTIGATIONS, CONFERENCES AND PUBLICATIONS AT CDFDC

The NPD reviewed the major lines of R & D in which his staff has been engaged on since the setting up of CDFDC. These included work on

- 1) Flame Retardency
- 2) Coating
- 3) Hygienic Finishes
- 4) Problems of Weft Diagonal Barriness
- 5) Mercerisation of PE/Co Blends
- 6) Fixation of Reactive Dyes
- 7) Academic Projects.

Although each project was discussed in outline, lack of time prevented any meaningful discussions with the staff involved. Individual experts will be asked to review these investigations and so will the CTA on his next mission.

The NPD also reported that two Conferences had been organized by the CDFDC on the subjects of:

- 1) Application of New Textile Auxliaries
- 2) Review of New Coating Materials and Techniques.

These Conferences were organized for the benefit of staff from small- to medium-sized companies.

Amongst publications by CDFDC is a Dyeing and Finishing Journal aimed at the entire industry. A copy of the Journal was made available.

VIII LECTURES BY CTA

At the request of the NPD, the CTA agreed to deliver two half-day lectures to an invited audience made up of staff from CDFDC, STRI and engineers and managers from the Shanghai Dyeing, Printing and Finishing Industries.

The topics chosen by the NPD were:

1. New Trends in the Field of Pretreatments.
2. Recent Developments in Chemical Finishing of Cotton and PE/Co Blend Fabrics.

As no advance notice had been given, the CTA spent three evenings and one half-day in preparing the lectures, the texts of which in MS form were translated by the NPD's Assistant Mr Cai Pei-Wei, with great skill and meticulousness into Chinese. Both lectures are available in English and Chinese at the CDFDC.

Some 70 people attended both lectures which were held on the premises of STRI. The NPD's Assistant chaired the first lecture and Mr Cheng Cheng-Kang, Vice-Secretary General and Director of Project Planning Department of CDFDC, the second.

The CTA received splendid support from Mr Cai Zhong Fang, Vice-Director of CDFDC, and his staff in getting transparencies prepared for overhead projection. Owing to the shortage of time no 35-mm slides could be shown.

The lectures were received with great enthusiasm and long discussions ensued after the lectures, with the CTA agreeing to provide BASF and CHT formulations for low energy cold bleaching processes, the name and address of the Hong Kong agent of the UK manufacturer of a novel steam purging machine, Sir James Farmer Norton, etc., etc.

IX WORKS VISITS

The following schedule of works visits was arranged for the CTA.

Date	Factory	Personnel
22.1.1988 a.m.	Shanghai Silk Printing Mill No.5	M/s QIAN HAO Director
-do- p.m.	Shanghai No.1 Silk Dyeing & Printing Factory	Mr SHI ZHONGSHAN Director & Engineer
23.1.1988 a.m.	Shanghai No.2 Dyeing & Printing Mill	Mr FANG CAI XIN Vice-Director. Mr ZHOU PEI FEN Vice-Chief Technical Section
-do- p.m.	Shanghai Li Xin Printing & Dyeing Factory No.11	Mr CHEN SONG-HUA Engineer
25.1.1988 a.m.	Shanghai Xin Feng Dyeing & Printing Factory No.6	Mr CHENG LIANG TIAN Director. Mr WANG AO FA Associate Chief Engineer
-do- p.m.	Shanghai Hua Seng No.5 Printing & Dyeing Factory	Mr DU SHUANG XIN First Deputy Manager and Mill Director. Mr YAC JIANGYUAN Engineer.

Three full days were spent visiting two silk dyeing and printing mills and four cotton and PE/Co dyeing and printing mills, accompanied by Mr Cai Pei-Wei, the NPD's Assistant and Interpreter, and on some visits by Mr Cai Zhong Fang, a Vice-Director of the CDFDC. The CTA had expressed a wish to see both large and medium-sized mills, and this request was granted by showing us on the same day No.2 Dyeing and Printing Mill with five continuous production lines, three for dyeing and printing PE/Co blended fabrics, two for 100% cotton fabric. Their throughput was 120 million metres/annum with a turnover of 40 million Renminbi Yuan p.a. They employed a staff of 2,400, of whom 108 were technicians and 200 were employed on the management side.

By contrast, No.11 Printing and Dyeing Factory had an annual production of 30 million metres and employed 850 people.

The visits tended to follow a similar pattern. After formal, but invariably friendly introductions, the factory management told the CTA the type and volume of production, the type of machinery being used, the nature of the goods being processed, whether dyed or printed or both, their end-use and what proportion was destined for the home market and export respectively. This was generally followed by a very extensive tour of the factory with everything being available for inspection and questions and comments invited. After each factory visit, the CTA was asked to give a candid account of his impressions and suggestions for improvement. Frequently long technical discussions ensued on such diverse subjects as:

(i) dischargeability of acid dyes in silk printing, the apparent lack of brilliant dischargeable dyes in the Ciba-Geigy range, (the CTA suggested the use of reactive dyes which would meet their requirements), the inadequacy of discharging agents etc; (ii) the continued use of sodium chlorite as a bleaching agent, which in W.Europe, USA, and also in certain parts of Asia (primarily Hong Kong, S. Korea and elsewhere), had been replaced by hydrogen peroxide, which was more effective, versatile and cheaper; (iii) the use of pigments in printing PE/Co and 100% Co was questioned where factories were trying to penetrate the UK market, as rub fastness was not acceptable to multiples like Marks & Spencer; (iv) the control of free formaldehyde in resin finishing; (v) advances in foam finishing; (vi) problems in heat setting PE/Co fabrics; (vii) heat recovery from heat setting stenters; (viii) production of 'ruffle' (sculptured designs) effects on configurated belt, compressive shrinkage machines vs. their present techniques of obtaining the desired effect by printing thickened caustic soda print paste on to cotton; (ix) problems (numerous) in wax resist printing; (x) advice on the future of foam printing, etc.

To sum up, the CTA learnt a great deal about production methods and attitudes, the type of machinery available (90-95% Chinese origin) and the quality of the finished product. In turn, each factory management expressed their appreciation and gratitude to the CTA for the free and open discussions and the advice given. The CDFDC staff was highly satisfied with the outcome of each visit. The CTA promised to follow up various requests for further information, which will be communicated to a particular factory via the CDFDC.

X CONCLUSIONS

(1) The chief objective of the CTA's first mission has been satisfactorily accomplished. Complete agreement was reached with the NPD in defining the job descriptions of the international experts, the timing and duration of their missions and the names of the experts to be approached. A very strong team has been assembled and so far four of the six preferred experts have expressed their willingness to undertake their mission if approached by UNIDO. Personal History Forms have been dispatched or handed over to: Dr H.E. Bille, Ir. Jan Jongbloet, Mr L.W.C. Miles, Mr John Gordon.

(2) The CTA has rendered assistance to the NPD and his staff in advising on future (i) study courses, (ii) fellowships, (iii) planning and equipping the pilot plant, the construction of which has not yet started. In the CTA's opinion, the decision not to involve UNIDO in these activities, i.e. to go it alone, is not in the best interest of the avowed objective of the official project document "Strengthening of the China Dyeing and Finishing Development Centre".

(3) The excellent working relationships established with the NPD and his staff will be of great benefit to the above objective. Likewise, the very good and friendly relationships established with senior staff in six Shanghai dyeing and printing factories augurs well for the future in strengthening the relationship between the industry and the CDFDC.

XI ACKNOWLEDGEMENTS

The CTA wishes to put on record the splendid co-operation accorded to him by the NPD and his staff. All meetings were held in a spirit of mutual trust and respect for which the CTA is deeply grateful.

Additionally, the hospitality and generous entertainment, so thoughtfully provided by the NPD, Mr Zhou Wei-Tao, and his staff were very much appreciated by the CTA and his wife.

It was also considered a special honour that Mr Ding Li, Deputy Director and Senior Engineer of the Shanghai Textile Industry Bureau, gave a banquet in the CTA's honour at which the NPD and all his senior staff from the CDFDC were present.

UNIDO

ANNEX
PROJECT BUDGET/REVISION

PAGE 1

3. COUNTRY CHINA	4. PROJECT NUMBER AND AMENDMENT DG/CPR/85/056/F/01/99	5. SPECIFIC ACTIVITY Provision of Consultant Services
18. PROJECT TITLE STRENGTHENING OF THE CHINA DYEING AND FINISHING DEVELOPMENT CENTRE		

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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 Advisor	4.5	40,125			2.25	19,875	1.5	13,500	0.75	6,750
02 Preparation Expert	1.0	8,500			1.0	8,500				
03 Textile Printing Expert	1.0	8,500							1.0	8,500
04 Technical Information Systems Expert	1.0	8,500			1.0	8,500				
05 Product Development Expert	1.0	8,500							1.0	8,500
06 Finishing and Coated Fabrics Expert	1.0	8,500					1.0	8,500		
07 Textile Dyeing Expert	1.0	8,500					1.0	8,500		
08										
09										
10										
11										
12										
13										
14										
15										
16										
11-50 Short term consultants	1.5	13,500								
11-99 Sub-total-international experts **	12.0	104,625			4.25	36,875	3.5	30,500	2.75	23,750
21. REMARKS										

** If more than 10 experts required check here and attach continuation sheet 1A. This sub-total must include all experts.