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18833

Distr.
RESTRICTED

IO/R.188
1 March 1991

UNITED NATIONS
INDUSTRIAL DEVELOPMENT ORGANIZATION

ORIGINAL: ENGLISH

STRENGTHENING OF CHINA DYEING AND
FINISHING DEVELOPMENT CENTRE

DG/CPR/87/017/11-01

PEOPLE'S REPUBLIC OF CHINA

Technical report: Fourth visit*

Prepared for the Government of the People's Republic of China
by the United Nations Industrial Development Organization

Based on the work of George W. Madaras,
Chief Technical Adviser

Backstopping officer: J.P. Moll,
Agro-based Industries Branch

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ABBREVIATIONS

BSO	Back Stopping Officer
CDFDC	China Dyeing and Finishing Development Centre
CICETE	China International Centre for Economic and Technical Exchanges
Co	Cotton
CTA	Chief Technical Adviser
FR	Flame Retardant
H/S	Heat Setting
HT	High Temperature
ID	Information Department
IR	Infra Red
NPD	National Project Director
PD	Project Document
PE	Polyester
PE/Co	Polyester/Cotton blend
PP	Pilot Plant
PPER	Project Performance Evaluation Report
PRC	People's Republic of China
PU	Polyurethane
R & D	Research and Development
RDD	Research and Development Department
STIB	Shanghai Textile Industry Bureau
STRI	Shanghai Textile Research Institute
TC	Transfer Coating
TD	Training Department
TIS	Technical Information System
TPRM	Tripartite Review Meeting
UNDP	United Nations Development Programme

I. SUMMARY

During the fourth and final mission (20th October to 20th November 1990) progress was monitored of the Four 'Immediate Objectives', as described in the Project Document "Strengthening of the China Dyeing & Finishing Development Centre", for the year ending December 1990.

Continued good progress can be reported in respect of the work and activities of the RDD and TD and ID. (Outputs 1, 3 and 4 in the PD and PPER No.3).

The building construction of the PP was completed in July, 1990 three months behind schedule; likewise installation and commissioning of machinery, now scheduled for December, 1990, is three months behind the date agreed at the last TPRM. A major effort has gone into the design, manufacture, erection and commissioning of a full-scale TC machine in the PP, capable of producing TC fabrics on a commercial scale. Considering the progress made towards completion of the PP, this output, too, must be considered satisfactory (output 2 in PD and PPER No.3).

A 'justification' for a Phase II of the Project has been prepared on behalf of CDFDC for submission to UNIDO/UNDP after its approval by the Ministry of Textile Industry and CICETE. A case is made for completing gaps in the building programme and provision of machinery, notably in the field of textile printing.

II. INTRODUCTION

The background to the formation of the CDFDC and the four 'Immediate Objectives' laid down in the PD for its efficient functioning have previously been described in the Technical Report:

First Visit of the Chief Technical Adviser (ref. DP/ID/SER.A/975)
dated 25 February 1988.

During the 2nd visit, progress made by CDFDC up to December 1988 and during the 3rd visit, - do. - 1989 were monitored, two PPER's were agreed and prepared in collaboration with the NPD for consideration by the first TPRM (March 1989) and the Mid-TPRM (April 1990) respectively. The activities of CDFDC were encouraged by discussions, lectures and factory visits which are described in the two Technical Reports:

Second Visit of the Chief Technical Adviser (ref. DP/ID/SER.A/1153)
dated 13 February 1989.

Third Visit of the Chief Technical Adviser (Ref. IO/R.139)
dated 7th March, 1990.

The purpose of the CTA's fourth and final mission has been:-

First, to monitor and assess the progress made in the year ending December 1990 in meeting the four 'Immediate Objectives', viz. i/ strengthening the RDD; ii/ establishing a PP; iii/ establishing a TD; iv/ establishing an ID.

Secondly, to agree with the NPD the contents, followed by writing the Third Project Performance Evaluation Report (PPER), which forms the main input to the Terminal Tripartite Review Meeting (TPRM) schedule for June, 1991.

Thirdly, to draft on behalf of CDFDC management a "Justification for a Phase II" document for submission to the Ministry of Textile Industry and CICETE. An agreed version of a "Justification for Phase II", in which the Chinese Government contribution has been formally agreed, will then be submitted to UNIDO/UNDP for funding.

Fourthly to help and advise on the activities of the CDFDC.

III. RECOMMENDATIONS

It is recommended that:

1. The PP is fully commissioned as soon as possible; the latest target date is 31.12.1990.
2. An early start is made in implementing the three outputs envisaged in the PD for the PP, viz. that the PP is capable of:
 - i/ developing production scale processing procedures for processes developed by Sections of the RDD (Output a),
 - ii/ providing development facility services for STRI (co-operation agreement), and to industrial mills, complete with process recordings and recommendations (Output b),
 - iii/ providing training facility services for trainees placed by the TD of the Centre (Output c).

It is essential for CDFDC management and staff to realise that by the date of the 'In-Depth Evaluation' in the second half of February, 1991, tangible evidence must exist that ALL SECTIONS of the PP are fulfilling the aims and objectives of the Project.

3. Serious consideration be given to the advice and recommendations contained in the Printing Expert's report (Ref. IO/R.157; 12 July 1990) with particular reference to the scale of operation of the proposed printing line. The proposal put forward by CDFDC in a document "Justification for a Phase II" of the project: "Strengthening of the China Dyeing and Finishing Development Centre" differs in some important details from the opinions expressed by the Printing Expert.
4. The Fellowship programme is resumed at an early date.
5. The 3rd Study Tour is allowed to take place in January, 1991.

IV. PROJECT PERFORMANCE EVALUATION REPORT (PPER No.3)

The contents of the 3rd PPER were agreed between the NPD and the CTA. The completed report has been distributed by CDFDC to all interested parties, viz. i/ Ministry of Textiles (Dr Zhong Changsheng), CICETE (Mrs Wang Wei Li), UNDP (Mr Barry Crowston), UNIDO (Backstopping Officer).

The newly completed PPER, completed on schedule, as requested by L.N. Soumarokov, Deputy Director-General, DIO, in a letter dated 25/6/90, Subject: Project Performance Evaluation Report (PPER) - Schedule 1990/91, will form the main input for the Terminal Tripartite Review Meeting (TPRM) now expected to take place in June, 1991.

V. SUMMARY OF THE MID-TRIPARTITE REVIEW MEETING (MID TPRM)

The Mid TPRM was held on 3rd and 4th April, 1990 in Shanghai, attended by representatives from CICETE, Ministry of Textile, CDFDC, UNDP and UNIDO.

The UNDP representative, Ms. Zhang Xi Wei, issued minutes on 28th May, 1990 which were distributed to the interested parties. At the request of the BSO, the CTA prepared an 'Assessment of the Mid TPRM' for UNIDO files. The NPD summarized CDFDC's 'outputs' under four headings:

- 1/a. Construction of PP
- 1/b. Operation of PP
2. Work carried out by RDD
3. - do. - ID
4. - do. - TD

Although much of the NPD's review has already been reported in the CTA's Third Technical Visit Report, dated 7th March, 1990 (Ref. IO/R.139), the following conclusions, decisions, and recommendations agreed at that meeting should be mentioned.

- i/ all parties were in agreement that progress made by CDFDC since the last TPRM (March, 1990) was more than satisfactory and providing that the rate of progress is being maintained, all Development Objectives will have been met by the newly agreed 'End of Project Date', i.e. 30th June, 1991,
- ii/ an 'In-Depth' Evaluation' is to be held in the second half of February, 1991 and the Terminal TPRM in June, 1991,
- iii/ a Phase II of the Project was desirable. A framework document is to be prepared by CDFDC with the help of the CTA setting out the Development Objectives of a Phase II of the Project (document completed). The contents of the "framework document" are to be agreed with the Ministry of Textile Industry and CICETE, including the level of funding from Chinese sources, before an approach is made to UNDP/UNIDO for financial support.

VI. REVIEW OF ACTIVITIES AND OUTPUT

VI.A. Research and Development (RDD)

i/ In the CTA's 3rd Technical Report, work on iv/ Advances in Coating Technology was reported (p. 16) and this project continues to make good progress. At a technical conference organised by the China Engineering Society, Sub-committee Dyeing and Finishing, in April, 1990, a wide variety of new and novel coating methods and products was discussed. The conference dealt with:

- a/ an exchange of experience of coating techniques in different mills;
- b/ - do. - of new coated fabrics for new outlets.

The conference was attended by some 120 delegates, some 15 producers of coated fabrics and some 20 manufacturers of auxiliary products. The remainder were coating specialists and technical and commercial personnel. Beginning 9th December, 1990, a number of seminars are planned to be held in the PRC to disseminate the results of this conference.

ii/ Transfer Coating

Under the direction of Mr Cai Zhong Fang, Vice-Director of CDFDC, considerable effort has been devoted to developing TC techniques from a small-scale laboratory machine to bulk processing on a full-scale PP machine. CDFDC's achievement in developing a multi-purpose small-scale laboratory TC machine was recognized by the Ministry of Textile Industry who arranged to have it exhibited in Beijing for the coating industry's benefit. The laboratory coating machine is manufactured by Shanghai Light Industry Machinery Factory at a cost of RMB Y 135,000. Two machines have been sold so far. The full-scale PP machine was successfully commissioned with the help of UNIDO's expert in fabric coating, Mr. Jan Jongbloet. Discussions are in progress between CDFDC and a third party to have 500,000m cotton fabric transfer coated on commission. The end-use is shoe uppers.

iii/ Pigment Dyeing

A two-year collaborative project, involving CDFDC, STRI and China Textile Engineering Society (Beijing), has been set up to evaluate both

imported and Chinese "binders" for pigment dyeing systems. Improvements are required in the following areas: a/*handle*, pigment dyed (or printed) fabrics tend to have a firm hand and a softer handle is required; b/*fastness*, pigment dyed (or printed) fabrics tend to have lower abrasion resistance than conventionally dyed (or printed) fabrics; c/*running properties*, compositions containing pigment and binder frequently give problems due to breakdown of the pigment composition on the application rollers. The International Expert on Fabric Dyeing (Ref. 11-07), visiting CDFDC at present, has been involved in trying to find ways to reduce this problem.

iv/ Coated Finishes for Nylon Base/Backcloth for Trademark Labels

CDFDC is collaborating with a mill in Wenzhou (Zhejiang Province) in developing coated finishes, based on acrylic compositions, for nylon 'basecloth' fabrics, end-use: trademark labels. In a parallel development, resin finishes are being evaluated in collaboration with a mill in Shanghai. Fabrics for trademark labels have up to now been imported and a successful outcome would result in 'import substitution'.

v Colour Matching System

The Ministry of Textile Industry has commissioned CDFDC to investigate the pros and cons of the numerous colour matching systems in use in the PRC. In particular, it is to be ascertained why a dyeing and finishing mill in Dalian (Liaoning Province) has consistently obtained better reproducibility of shade than other mills. The results of this two-year investigation will benefit all Co and Pe/Co dyeing and finishing mills in obtaining better reproducibility and consistency from (hopefully) fewer colour matching systems.

vi/ Eighth Five-year Plan

This commission from the Ministry of Textile Industry, previously reported in Part IV item 6 of the 2nd PPER, resulted in a draft plan, which was submitted to the Ministry of Textile Industry. The plan has since been extensively discussed with management of industrial mills at three conferences and a 'Revised Final Plan' has been submitted to the Ministry of Textile Industry.

VI.B. Pilot Plant (PP)

1. Buildings

Building operations were completed in July, 1990, three months behind schedule (c.f. CTA's Third Technical Visit Report). Services were installed by August, 1990 including; i/water supply and water treatment (softening) equipment; ii/ electricity supply; iii/coal-fired boilers supplying steam and hot oil. The following buildings are completed:-

- a/ Processing Plant comprising Main Workshop for Preparation, Dyeing and Finishing Operations. Ample space exists for adding printing facilities at a later stage.
- b/ Two Boiler Houses supplying steam and hot oil (for heating).
- c/ Garage, Washrooms with Showers.
- d/ Storage Shed for dangerous and inflammable chemicals.
- e/ Canteen.
- f/ Reception/Gatehouse
- g/ Finishing Workshop; so far one section is complete and used for TC.
- h/ Chemical Laboratory.
- i/ Chimney.

A number of projected buildings have not yet been started due to lack of Central and Local Government funding, chief amongst these are:-

- j/ Warehouse for grey and finished goods.
- k/ Maintenance Workshop.
- l/ Office Building.
- m/ Miscellaneous other structures, including waste water, i.e. effluent disposal plant.

It is to be hoped that additional finance will be made available by Chinese Central and Local Government sources in a projected Phase II of the Project, so that these much needed buildings can be erected.

2. Machinery and Equipment

The installation of machinery, both Chinese and Foreign, is about three months behind schedule as specified at the Mid Term TPRM (3/4/90). The delay is due to a variety of reasons, including delays incurred in completing the buildings, late delivery of machinery, unforeseen problems

which arose during assembly and erection of machinery. The Director of the PP, Mr Chen Xia, is confident that all machines purchased and delivered under Phase I will be installed and in working order by the end of December, 1990.

Annex X.D. (p.31) contains details of both Foreign and Chinese machinery and equipment at the PP and its status on 1/11/90.

By reference to Annex X.D. (p.34) in the CTA's Third Technical Visit Report, it transpires that neither the double face gas singeing machine (LMH-003 AJ-180) nor the cold pad-batch machine for scouring/bleaching Co was purchased due to lack of funds. It is imperative that these two machines should be obtained as soon as possible to ensure that fabrics to be dyed and finished at the PP can also be adequately prepared. Purchase of these two machines has been requested in the Justification for Phase II (see VII.D p.19).

At present the PP employs 110 workers and staff, which includes one engineer, four assistant engineers and six technicians.

VI.C. Training Department (TD)

Training courses, workshops, seminars and technical conferences were held on the premises of STRI, Shanghai Textile Engineering Association, Shanghai Dyeing and Finishing Research Institute, Shanghai Textile Engineering University and also in textile mills.

The following seminars and conferences were held at different venues in Shanghai with attendances in brackets:

- a/ UNIDO's Expert in Textile Printing gave five lectures (c.v. VII.A.) as part of a three-day seminar (60).
- b/ UNIDO's Expert in Textile Finishing and Fabric Coating gave five lectures (c.f. VII.A.) as part of a three-day seminar (60).
- c/ Dye manufacturers, James Robinson of Huddersfield, U.K., held a two-day conference on "Liquid Sulphur Dyes in Continuous Dyeing" (55).
- d/ Machinery manufacturers, Krantz of Aachen, Germany, held a three-day conference on "Carbonizing of Wool" (40/50).
- e/ Senior engineers from textile mills in the PRC attended three seminars (40 participants per seminar) on "New Theories of Dyeing, Printing and Finishing". The lectures were given by staff members chosen from CDFDC, China Textile University and personnel from industry (120).

Some 350 people attended the previously described seminars and conferences; another 500 participants attended various training courses and workshops. The information provided will help scientific and technical staff in institutes and mill personnel at all levels:

- i/ to keep abreast of technical innovations and new processing procedures,
- ii/ to understand more fully the nature of their tasks and responsibilities,
- iii/ to function more effectively, thereby increasing output and reducing unit costs of production.

VI.D. Information Department (ID)

As previously reported two-monthly publications are widely circulated to the textile wet processing industry, i.e. dyers, printers and finishers.

These are:

- a) "Dyeing and Finishing", published in collaboration with STRI, reports the results of dyeing and finishing investigations carried out by STRI & CDFDC;
- b) "Dyeing and Finishing Information", provides news and views about the industry.

Information on availability and description of dyes, chemicals and auxiliaries in use in the PRC is being collected and stored in a computer. Details of scientific and technical articles published worldwide on dyeing, printing and finishing are also collected and stored. A manual database and retrieval support service for the staff of CDFDC, STRI and industry functions normally.

The Jiangsu Provincial Government has commissioned CDFDC to carry out an 'in-depth' investigation into the "modus operandi" of four dyeing and printing mills in the Province whose performance in terms of output and quality has consistently been above average. The mills involved are at: i/ Kunshan, ii/ Changzou, iii/ Jianyin, iv/ Yong Zhou. The results of the investigation, if approved by the Provincial Government, will be disseminated at a conference (to be organised) and published in 'Dyeing and Finishing'.

At the request of the Shanghai Commercial City Hotel Group, CDFDC are advising on the standards of flame repellency and the sourcing of F.R. treated fabrics, such as: furnishings, curtains, carpets, bed linen, etc. for 900 hotel bed rooms.

VII. REVIEW OF OTHER ACTIVITIES

VII.A. Revised Schedule for International Experts

Project No. DP/CPR/87/017

<u>Post/Title</u>	<u>Ref.</u>	<u>Duration</u>	<u>Date Required</u>
Chief Technical Adviser	11-01	i/0.7m/m	17 Jan 1988-6 Feb 88 (Mission Completed)
		ii/1m/m	22 Nov 1988-22 Dec 88 (Mission Completed)
		iii/1m/m	31 Oct 1989-29 Nov 89 (Mission Completed)
		iv/1m/m	20 Oct 1990-20 Nov 90 (Mission Completed)
Experts in:			
Prep. of Co & Co blends	11-02	1m/m	June 1988 (Mission Completed)
Tech. Information Systems	11-04	1m/m	August 1989 (Mission Completed)
Textile Printing	11-03	1m/m	March - April 1990 (Mission Completed)
Tex. Finishing & Fabric Coating	11-06	1m/m	July 1990 (Mission Completed)
Textile Dyeing	11-07	1m/m	Nov - Dec 1990 (Mission Completed)
Product Development of Textiles	11-05	1m/m	March 1991

Comments

11-03 Textile Printing Expert Mr G.S. Anthony (Tony) Corbishley visited CDFDC from 28th March to April, 1990. During his stay, visits were made to five Shanghai Dyeing and Printing Mills for the benefit of the mills concerned. Formal lectures with discussion periods and seminars took place on three days. The lectures given by the expert were chosen by the NPD and are listed on p.18 of the CTA's Third Technical Report (Ref. IO/R.139; 7 March 1990). The expert also discussed the future role of CDFDC, particularly in the context of CDFDC's participation in the development of the textile printing industry of PRC. His conclusions are summarized on pp 9-15 of his Technical Visit Report (Ref. IO/R.157; 12 July 1990). They represent a very useful contribution to the future activities of CDFDC, particularly in the light of the proposed Phase II of the Project.

11-06 Textile Finishing and Fabric Coating Expert. Ir Jan A. Jongbloet visited CDFDC from 9 to 29 July 1990 and during his stay three Shanghai dyeing and printing mills were visited with benefits to the mills concerned. A three-day formal lecture cycle with discussion periods covered a range of technical topics requested by the NPD. The lectures are listed on p.12 of the CTA's Second Technical Visit Report (Ref. DP/ID/SER.A/1153; 13 February 1989). The expert devoted much of his time to carrying out trials on the laboratory coating machine. He also helped to commission and to carry out proving trials on the full-scale PP coating machine. The future role of CDFDC in the development of the textile finishing and fabric coating industry of the PRC was reviewed and discussed in depth. Mr Jongbloet's visit has materially furthered the development of CDFDC's transfer coating operation and his contribution to the success of this operation has been generously acknowledged. An excellent Technical Visit Report has been published (Ref. IO/R.170; 4 September, 1990).

11-07 Textile Dyeing Expert. Dr Wolfhand Beckmann visited CDFDC from 9 November to 5th December, 1990 and during his stay visited five Shanghai dyeing and printing mills where his wide knowledge and experience were much appreciated. Several days were devoted to formal lectures, colloquia and discussion periods. The latter were held for the benefit of CDFDC and STRI staff engaged in dyeing investigations. The titles of the five lectures delivered by Dr Beckmann were chosen by the NPD and are listed on p. 12 of the CTA's Second Technical Visit Report (Ref. DP/ID/SER.A/1153; 13 February,

1989). At the time of writing, Dr Beckmann's Technical Visit Report has not yet become available.

11-05 Product Development of Textiles Expert. The present candidate, Mr. John Gordon, has informed the CTA that, because of other commitments, he is not available in March, 1991 and cannot take up his appointment until 15th April, at the earliest. The NPD has been informed and it has been agreed to approach the next candidate, Mr Roger Bellfield, to ascertain his availability. In discussing the visit of the Product Development expert with the NPD, it was decided to ask the expert to deliver the following five lectures:-

1. Trends in overseas markets for apparel fabrics both for ladies and gents wear.
2. New developments in all types of decorative fabrics, with particular reference to "New Materials & New Fashions".
3. New developments in coated fabrics.
4. Technical and industrial fabrics including non-wovens.
5. Background to and methods of selection of international fashion colours.

As on previous occasions, the NPD requested that CDFDC are provided with typed copies of all lectures at least three weeks prior to the start of the mission.

VII.B. Fellowships

During 1990 two further Fellowships were taken up each of six months duration.

Mr DONG Huiqing was accepted by Bayer AG, Dyestuff Division at Leverkusen, Germany, and worked in their Research Department.

Mrs ZHOU Dexin was accepted by Ciba-Geigy, Dyestuff Division at Basle, Switzerland and worked in their Research Department.

Both fellows stated that they had greatly benefited from their training.

Four more fellows are earmarked to spend six months abroad. Mr Zhang Yu Fan is due to start his study at Osaka Textile Research Institute, Japan in March, 1991; at the same time Mr WU Pei Qing should commence his training at Hoechst AG in Frankfurt, Germany. The remaining two fellows require placing at two of the following organizations: i/ ICI Organics, Manchester; ii/ BASF Ludwigshafen; iii/ Allied Colloids, Bradford; iv/ Technical University, Budapest (Prof. I. Rusznák). As the Fellowship programme is at present suspended, the CTA is awaiting further instructions before reopening discussions with ICI (very reluctant to take a Fellow), BASF (who insist on a German speaking graduate), Allied Colloids or Professor Rusznák who seem more amenable.

Brief details of the Fellowship Programme (completed, in progress, and planned) are given in tabular form below. The duration of all Fellowships has been reduced to six months from the ten months stated in the PD.

<u>NAME</u>	<u>INSTITUTION</u>	<u>PLACE AND LOCATION</u>	<u>DATE</u>	
			from	to
1. CAI Zhong Fang	Shirley Institute	Manchester, U.K.	Mar 88	Oct 88
2. QI Rong	Hamburg University	Hamburg, Germany	Apr 88	Oct 88
3. Miss HAO Ping	SRRC	New Orleans, U.S.A.	May 89	Nov 89
4. Mrs ZHOU De Xin	Ciba-Geigy	Basle, Switzerland	Mar 90	Sep 90
5. SHI Wei Ming	Courtaulds	Derby, U.K.	Aug 89	Feb 90
6. DONG Hui Qing	Bayer	Leverkusen, Germany	Jan.90	Jul 90
7. ZHANG Yu Fan	Osaka Res. Inst.	Osaka, Japan	Mar 91	Sep 91
8. WU Pei Qiang	Hoechst	Frankfurt, Germany	Mar 91	Sep 91
9. ?	BASF or ICI	Ludwigshafen, Germany Manchester, U.K.	Mar 91	Sep 91
10. ?	Allied Colloids or Müegyetem	Bradford, U.K. Budapest, Hungary.	Mar 91	Sep 91

VII.C. Study Tours

According to the Revised Work Plan (see item 22 Annex X.A), the Third Technical Study Tour, again involving six senior persons from the Ministry of Textile Industry and CDFDC, is now expected to take place in January 1991. It is intended to visit machinery manufacturers and textile wet processors in the following European countries: Belgium, Germany and Spain.

A recommendation for permission to be granted for the Study Tour to take place was made in the Third PPER dated 15.11.1990.

VII.D. Justification for Phase II

At the Mid-TPRM held on 3rd April, 1990 it was informally agreed that CDFDC management should prepare a "framework document" stating the activities and development objectives in a Phase II of the present project. The CTA was asked to render assistance to the NPD in drafting the "framework document".

The contents of a Justification for Phase II "framework document" were duly discussed with the NPD and such a document was completed on 14th November, 1990. Copies have been made available to interested parties.

There are three objectives in a Phase II to the existing project at CDFDC.

- 1/ To set up an up-to-date rotary screen printing Line.
- 2/ To add 1000m² factory floor area to the existing PP.
For details of the projected buildings see VI.B. PP.1. Buildings.
- 3/ To purchase and install much needed preparation machinery in the existing PP. For details of machinery see VI.B. PP.2. Machinery and Equipment.

VII.F. Factory Visit

No. 1 Northwest Dyeing and Printing Mill, Xian.

Present: Mr Zhu Pu Ren - Vice Chief Engineer

Mr Wang Hao - Representing Shaanxi Province Textile Corporation

Mr Shen Song Xiang - Senior Engineer, CDFDC

The purpose of this visit to the well known dyeing, printing and finishing mill in Textile Town, Xian, Shaanxi Province was:-

- i/ to appraise and compare: layout, machinery, production performance and quality with similar mills in the Shanghai area;
- ii/ to see and discuss at first hand the F.R. Finish developed by Shaanxi Province Research Institute in collaboration with No. 1 Northwest Dyeing and Printing Mill.

i/ No. 1 Northwest Dyeing and Printing Mill was built in 1956 and employs 2,900 workers. It has an output of 120 million m. per annum, which compares in volume output with that of Shanghai No.2 Dyeing and Printing Mill. Its output consists mainly of Co and PE/Co fabrics with smaller quantities of PE/rayon and 100% filament PE fabrics. Processing is carried out continuously and typical equipment seen included:

- a/ Preparation Gas singeing machine (Sando Japan)
Continuous preparation range: Arbox padding mangle,
Penhle H.T. steamer running at 80/90m/m. Prepared PE/Co
fabrics had good absorbency and acceptable whiteness.
Other foreign machines noted included the following:
Gaston County scouring and dyeing machine
Brugman chainless merceriser
Montex-Montforts H/S unit operating at 80m/m
- b/ Dyeing Chinese vat dyeing range running at 40m/m
2 Thermosol units:
 - i/ Küsters pad + Montforts IR predryer/thermofix
 - ii/ do. + Kyoto do.
 Rapid Uni Ace jet (C. Itoh, Japan) operating at 130°C;
90kg/tube

- c/ Printing Copper roller machines printing naphthol colours at 100m/m
 Stork rotary screen machines
 Arioli steamer for flash ageing process
 Artos steamer
- d/ Finishing Kyoto resin finishing plant incl. curing unit operating at 160°C

The impression gained is of a well-run dyeing, printing and finishing operation, using a wide range of old to new Chinese and foreign machines, and producing attractive fabrics for both the domestic and export markets (but not of up-market quality).

ii/ No. 1 Northwest Dyeing and Printing Mill has developed an FR finish for: 100% Co and 50/50 PE/Co workwear fabrics. The finish is based on a combination of a phosphorus base, organic compounds and Anti-blaze 19T (ex Mobil USA). The finish is claimed to be fast to repeated washing and demand for the FR finished fabrics has warranted production in three shifts.

The add-on of FR solids is 20% for 100% Co and 30% for PE/Co fabrics. The finish is cured in ammonia vapour for 20 secs at 50°C (100% Co) and 60°C (PE/Co). Patterns of FR treated workwear made available were firm (100% Co) and firm to stiff (50/50 PE/Co). Tests carried out on both patterns, as supplied and after 1 and 5 washes, gave the following results:

VERTICAL FLAME TEST (VFT) - FR treated

	<u>100% Co</u>	<u>50/50 PE/Co</u>
As supplied	good; <u>passes</u>	some after-burning, but self-extinguish; <u>passes</u>
After 1 wash at 60°C	good; <u>passes</u>	burns; not self-extinguishing; <u>fails</u>
After 5 washes do.	some after-burning self-extinguishing; <u>passes</u>	burns; continues burning; <u>fails</u>

The conclusions are: the FR treated 100% Co workwear fabric passes the VFT, but the FR treated 50/50 PE/Co workwear fabric DOES NOT as it fails on washing. Moreover, the handle is too stiff; it would not be commercially acceptable in the U.K.

VIII. CONCLUSIONS

In his fourth and final mission report the CTA wishes to put on record that after a slow and uncertain start, the Project has made considerable headway. In particular, the activities and outputs of all four 'Immediate Objectives' now meet the criteria laid down in the PD. This applies particularly to the outputs of: 1/RDD; 3/TD; 4/ID. (as modified at the Mid-TPRM). The 'Immediate Objective' of Setting-Up a PP (output 2) is also being met, although a little behind schedule as agreed at the Mid-TPRM. Thus, the erection of the PP buildings was completed in July 1990 (three months behind schedule); installation and commissioning of machinery, scheduled for completion in September, 1990 is now expected to be completed by the end of December, 1990 (again three months behind schedule).

As the end of the Project has now been postponed to the end of June 1991, it is essential that CDFDC management ensures that *ALL SECTIONS* of the PP are meeting the aims and activities of the Project by the date of the 'In-Depth Evaluation' in the second half of February, 1991.

Owing to the lack of certain processing facilities in the PP, it is essential that in a Phase II of the Project (yet to be agreed and approved), the purchase and installation of preparation and printing machinery are given the green light.

IX. ACKNOWLEDGEMENTS

The CTA wishes to thank Dr Zhong Changsheng, Deputy Division Chief and Mr Chen Rong, both of the Department of International Cooperation, Ministry of Textile Industry, Beijing, for their help and cooperation during his two visits to Beijing. The CTA was pleased to have held detailed discussions with Mr Zhong and Mr Chen concerning the progress and achievements of the Project "Strengthening of the China Dyeing and Finishing Development Centre" on his return to Beijing on Friday, 16th November, 1990.

It is a pleasure to recall the banquet given by Mr Bei Yu Long, Director, Department of International Cooperation, Ministry of Textile Industry, for the CTA and his daughter as well as for Mr Mortimer O'Shea, Dr Philip Smith and Mr Douglas Bland. The occasion provided a pleasant opportunity to renew contact with Dr Zhu Xing, as well as with other representatives from the Department of International Cooperation, MTI, CICETE, Ministry of Foreign Economic Relations and Trade.

The close working relationship, which exists between the NPD, and his staff and the CTA, continues as before. A very good spirit of cooperation also exists with the newly appointed Head of CDFDC, Mr Cai Zhong Fang.

The efforts of a large number of CDFDC staff members to be of assistance should be recorded, in particular, Mr Cai Pei Wei, Mr Shen Song Xiang, Mr. Chen Xia to mention but a few. The CTA would like to express his thanks to the NPD for the expeditious way the visit to Xian was arranged.

Y. ANNEXX.A. Revised and Updated Work Plan

<u>No.</u>	<u>Activity</u>	<u>Details</u>	<u>Duration</u>	
			<u>From</u>	<u>To</u>
1.	Construction of PP	Building started Dec.88 Completed July 90	Dec 88	Jul 90
2.	Fellowship No.3	Miss Hao Ping seconded to SRRC	May 89	Oct 89
3.	Imported Lab. Equipment	2 Roll Horiz. End ex. Benz ordered/delivered	Oct 90	Dec 90
4.	do.	Drying and Curing (H/S) Unit ex. Benz "		do.
5.	do.	Flammability 45° Tester ex US Testing Co. "		do.
6.	do.	" Vertical Tester "		do.
7.	do.	" Mushroom Tester "		do.
8.	Technical Study Tour	Tour No.2; USA, Canada, Singapore	Sep 89	Oct 89
9.	Fellowship No. 4	Mrs ZHOU de Xin seconded to Ciba-Geigy, Basle, CH	Mar 90	Sep 90
10.	Fellowship No. 5	Mr SHI Wei ming seconded to Courtaulds, Res.Div., Derby, UK	Aug 89	Feb 90
11.	Imported Machinery	HP Jigger ex. Vald Henrikson ordered/delivered	Sep 89	Aug 90
12.	do.	HT Jet/Overflow Machine ex Béné "	Sep 89	Jun 90
13.	International Expert	Tech. Info. Systems (Mr Brian Rostron)		August 89
14.	Imported Lab. Equipment	Lab. 8-beaker dyeing machine ex. W.Mathis ordered/delivered	Oct 90	Dec 90
15.	do.	" H.T. Jet/Overflow ex. W.Mathis - cancelled		
16.	Imported Machinery	Calender ex. Ramisch - Kleinewefer ordered/delivered	Dec 89	Oct 90
17.	Fellowship No. 6	Mr DONG Hui Qing, seconded to Bayer, Leverkusen, FRG	Apr 90	Oct 90
18.	International Expert	Textile Printing (Mr Tony Corbishley)	Mar 90	Apr 90
19.	CTA's Third Mission	Preparation of PPER for Mid TPRM		November 89
20.	PP Commissioning	PP to be fully operational with Imported and Chinese Machinery by December, 1990	Jul 90	Dec 90
21.	Mid TPRM	Shanghai, 3rd and 4th April 1990		April 90
22.	Technical Study Tour	Tour No. 3, FRG, Spain, Belgium		January 91
23.	International Expert	Textile Dyeing (Dr W. Beckmann)	Nov 90	Dec 90
24.	Fellowship No. 7	Mr ZHANG Tu Fan, seconded to Osaka Res. Inst., Japan	Mar 91	Sep 91
25.	" No. 8	Mr WU Pei Qiang seconded to Hoechst, Frankfurt a.M., FRG		do.
26.	International Expert	Textile Finishing/Fabric Coating (Ir Jan Jongbloet)		July 90
27.	In-Depth Evaluation	To take place 4 months before the end of project		February 91
28.	CTA's Final Mission	Preparation of PPER for Terminal TPRM	Oct 90	Nov 90
29.	Fellowship No. 9	Fellow seconded to BASF, Ludwigshafen, FRG	Mar 91	Sep 91
30.	Fellowship No. 10	" to ICI or Allied Colloids, UK		do.
31.	International Expert	Product Development (Mr John Gordon)		March 91
32.	Terminal TPRM	To be held in June 91 prior to termination of project		June 91
33.	End of Project	Extended to June 91		do.

Project No.: DG/CPR/87/017	Project Title: Strengthening of the CDFDC	Branch
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Year	1 9 8 9												1 9 9 0												1 9 9 1																					
Month	01	02	03	04	05	06	07	08	09	10	11	12	01	02	03	04	05	06	07	08	09	10	11	12	01	02	03	04	05	06	07	08	09	10	11	12	01	02	03	04	05	06	07	08	09	10
1989																																														
1990																																														
1991																																														

Item	Activity	Month	01 02 03 04 05 06 07 08 09 10 11 12												01 02 03 04 05 06 07 08 09 10 11 12												01	02	0							
			01	02	03	04	05	06	07	08	09	10	11	12	01	02	03	04	05	06	07	08	09	10	11	12										
1	Construction of PP																																			
2	Fellowship No. 3																																			
3	Lab.Equip. 2 Roll Pad (Benz)																																			
4	- do - Drying+Curing Unit(do)																																			
5	- do - Flamm ⁴⁵ Tester(USTest)																																			
6	- do - " Vert. Tester(do)																																			
7	- do - Mushroom Test (do)																																			
8	Tech. Study Tour No. 2																																			
9	Fellowship No. 4																																			
10	- do - No. 5																																			
11	H.P. Jigget (V.Hennk.) ord/del																																			
12	H.T. Jet/Overflow (Béné) - do -																																			
13	Int. expert (Tech. Info. Systems)																																			
14	Lab.Equip. Dyeing Mach.(W. Mattie)																																			
15	- do - H.T.Jet/Overfl.-cancelled																																			
16	Calendet(Ramisch) ord/del																																			
17	Fellowship No. 6																																			
18	Int. Expert (Textile Printing)																																			
19	CTA's third mission																																			
20	PP Commissioning																																			
21	Mid TPRM																																			
22	Technical Study Tour No. 3																																			

X.C. PROJECT BUDGET/REVISION

UNITED NATIONS DEVELOPMENT PROGRAMME
PROJECT REVISION

COUNTRY: People's Republic of China

PROJECT TITLE: Strengthening of the China Dyeing and Finishing Development Centre

PROJECT NO.: DG/CPR/87/017/D/01/37

The attached budget of the above-mentioned project is amended to reflect the actual expenditures for 1988 and 1989 and the anticipated expenditures till the expiry of the project in June 1991.

The project has been rephased to take into account the minutes of the mid-term tripartite review meeting of April 1990.

The change in the UNDP contribution is as follows:

Previous UNDP input - project budget "C"	US\$ 141,336
Revised UNDP input - project budget "D"	US\$ 166,939
	<hr/>
UNDP input - increase	US\$ 25,603
	<hr/>

Approved on behalf of the Government

Date

Approved on behalf of the UNDP

Date

UNIDO

PROJECT BUDGET / REVISION

Country CHINA	Project number and amendment DG/CPR/87/017/D/37	Specific activity J13102
Project title STRENGTHENING OF CHINA DYEING AND FINISHING DEVELOPMENT CENTRE		

	TOTAL		1988		1989		1990		1991		1992	
	n/n	\$	n/n	\$	n/n	\$	n/n	\$	n/n	\$	n/n	\$
INTERNATIONAL EXPERTS												
11-01 Chief Technical Adviser	5.1	69,977	2.0	25,942	1.3	18,315	1.3	19,720	0.5	6,000		
11-02 Bleaching expert	1.0	12,400	1.0	12,400								
11-03 Printing expert	1.0	14,492					1.0	14,492				
11-04 Info System expert	1.0	14,762			1.0	14,762						
11-05 Product development	1.0	10,500							1.0	10,500		
11-06 Coated fabrics	1.0	10,500							1.0	10,500		
11-07 Dyeing technology	1.0	10,500										
11-08												
11-09												
11-10												
11-11												
11-12												
11-13												
11-14												
11-15												
11-16												
11-50 Consultants												
11-51												
11-52												
11-53												
11-54												
11-55												
11-99 Sub-total international experts	11.1	143,131	3.0	38,342	2.3	33,077	4.3	55,212	1.5	16,500		
Remarks												
	8.6.90											

UNIDO

PROJECT BUDGET / REVISION

Project number DG/CPR/87/017/D/37	TOTAL		1988		1989		1990		1991		1992	
	n/n	\$	1/n	\$	n/n	\$	n/n	\$	n/n	\$	n/n	\$
OPRS EXPERTS												
12-01												
12-02												
12-03												
12-99 Sub-total OPRS experts												
ADMINISTRATIVE SUPPORT PERSONNEL												
13-00 Clerks, secretaries, drivers												
13-50 Freelance interpreters												
13-99 Sub-total Adm. support personnel												
UN VOLUNTEERS												
14-01												
14-02												
14-03												
14-04												
14-99 Sub-total UN volunteers												
15-00 Project travel		97				35		62				
16-00 Other personnel costs		22,000		857		2,566		2,236		16,341		
NATIONAL EXPERTS												
17-01												
17-02												
17-03												
17-04												
17-05												
17-99 Sub-total National experts												
18-00 Surrender prior years' obl.												
19-99 TOTAL PERSONNEL COMPONENT	11.1	165,228	3.0	39,199	2.3	35,670	4.3	57,510	1.5	32,841		

UNIDO

PROJECT BUDGET / REVISION

Project number DG/CPR/87/017/D/37	TOTAL		1988		1989		1990		1991		1992	
	n/n	\$	n/n	\$	n/n	\$	n/n	\$	n/n	\$	n/n	\$
SUBCONTRACTS												
21-00 Subcontracts												
28-00 Surrender prior years' obl.												
29-00 TOTAL SUBCONTRACTS												
TRAINING												
31-00 Individual fellowships												
32-00 Study tours; UNDP group training												
33-00 In-service training												
34-00 Non-UNDP group training												
35-00 Non-UNDP meetings												
38-00 Surrender prior years' obl.												
39-99 TOTAL TRAINING COMPONENT												
EQUIPMENT												
41-00 Expendable equipment												
42-00 Non-expendable equipment												
43-00 Premises												
48-00 Surrender prior years' obl.												
49-99 TOTAL EQUIPMENT COMPONENT												
MISCELLANEOUS												
51-00 Sundries		1,711		175		791		231		514		
55-00 Hospitality (non UNDP projects)												
56-00 Support costs												
58-00 Surrender prior years' obl.												
59-99 TOTAL MISCELLANEOUS COMPONENT		1,711		175		791		231		514		
99-99 PROJECT TOTAL	11.1	166,939	3.0	39,374	2.3	36,469	4.3	57,741	1.5	33,355		
Support costs		166,939		39,374		36,469		57,741		33,355		
GRAND TOTAL		166,939		39,374		36,469		57,741		33,355		

X.D. List of Foreign and Chinese Machinery and Equipment

A. <u>Foreign Full-Scale Production Machines</u>	<u>Status</u>	<u>Actual Cost</u> ₹
1. Jeans stone washing and treatment machine, (Tupesa)	Installed	27,500
2. Rotary coating machine, (Mitex)	Delivered	44,000
3. Thermobrush design machine (Mortamet)	Delivered	FF480,000
4. High pressure jigger (Vald Henriksen)	Installed	250,000
5. High pressure jet/overflow rope dyer (Béné)	Installed	200,000
6. Calender (Ramisch-Kleinewefers)	Delivered	300,000

B. Foreign Laboratory Equipment

1. Lab. drying and curing (H/S) unit Type MT (Benz)	Del. Dec.90)) 55,000
2. Lab. 2 roll horiz. padder type KLFH-F (Benz))	
3. Flammability 45° Test Instr. (US Testing Co)	do.	9,000
4. - do. - Vertical Test Instr. (do.)	do.	5,500
5. - do. - Mushroom Test Instr. (do.)	do.	20,000
6. Lab. 8 beaker dyeing machine (W. Mathis)	do.	45,000

C. Chinese Full-Scale Production Machines

	<u>Approximate Price RMY B</u>	
1. Double face gas singeing machine (LMH-003 AJ-180)	Postponed to Phase II	150,000
2. Cold pad-batch machine for (scouring/bleaching cotton)	do	400,000
3. Two jiggers (SM-315 C-180)	Installed	50,000
4. Rope opener	Installed	50,000
5. Cylinder dryer	Installed	50,000
6. Progressive shrinkage machine	Installed	150,000
7. Type SST short loop - short dry - tenter	Installed	500,000
8. Miscellaneous machines	Installed	110,000

Installation and commissioning of both Foreign and Chinese machines to be completed by the end of December, 1990.