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THE CHINA GARMENT TECHNOLOGY DEVELOPMENT CENTRE

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CHINA

Technical report: Production engineering*

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 G. Walsh
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United Nations Industrial Development Organization
Vienna

* This document has not been edited.

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ABBREVIATIONS

TGTDC	-	Textile Garment Technology Development Centre
U.K.	-	United Kingdom
C.T.A.	-	Chief Technical Adviser

Exchange Rate

The following exchange rate prevailed during the period of the assignment

$1 = ¥ 3.71

Dates of Phases:

Phase 1	6 June to 2 September 1988
Phase 2	26 September to 9 December 1988
Phase 3	9 January to 3 February 1989

Total period of assignment 7 man-weeks.

I. INTRODUCTION

The original intention was to divide the assignment into two twelve week parts and one four week part. Due to events this had to be modified; the first Phase was slightly lengthened and the second Phase shortened by a corresponding amount. The reasons for the changes were the delay in the arrival of certain essential items of equipment and materials.

During the course of the whole assignment, there were many delays, rescheduling of activities and changes in approach, all due to difficult local conditions.

II. PHASE 1

This Phase commenced on Monday 6 June 1988 and for the first week, consisted of meetings with TGTDC officials and staff, and visits to the factories who would be participating in the Production Engineering sub-project.

The second, third and fourth weeks were taken up with survey visits to the three participating factories:-

- Zheijiang Garment Research Factory (Pilot Plant) manufacturing jackets
- Hangzhou Shirt Factory, manufacturing shirts
- Hangzhou Childrens Factory, manufacturing a range of childrens clothing

The surveys were to establish the type of work being carried out; machinery used; layout; staffing, product range; methods; problems etc, and also to identify suitable projects to be undertaken by students attending the Production Engineering training course.

Week 4 was scheduled to be the starting point of the classroom-based part of the Production Engineering training.

On Friday 1st July, no training materials had arrived from U.K. and no stop-watches had arrived from Japan. It was decided that the course would commence on time, and hopefully the materials would arrive on day one.

The course materials did arrive in the afternoon of the first day, but no stop watches. It was decided to suspend the course pending the arrival of the watches.

The materials had been dispatched by air from Fielden House in the U.K. during the first week in June, but had been misdirected from Beijing to another project.

The stop watches eventually arrived on Tuesday 12 July. Unfortunately the watches were of the wrong type, making it necessary to change the method of teaching Time Study, to be able to use the equipment and so recommence the course.

The training course recommenced on Thursday 14 July and it was decided to work Saturdays so as to be able to pull the schedule back to only one weeks delay.

In spite of further interruptions due to power failures and the making of an epic video documentary, a total of 19 days out of a scheduled 20 course days was achieved. The missing one day of subject matter was included as tutorials during the factory project part of the course.

The level of activity was generally quite high during the course, with very good interaction, and a good level of commitment from the students.

As reported by the C.T.A. in his report of October 1988, there had been some misunderstanding by the factories as to who should attend the course, and some of the participants were managers who could not attend full time because of other commitments. When they did attend participation was not as high as it should have been, and I feel that their attendance on the course was to ensure that subordinates did not acquire knowledge that they did not have.

The final four weeks of Phase 1 was to be factory-based projects, where the students could return to their own factories and, supported by TGTDC staff, students (who would also act as interpreters) carry out projects which would bring direct benefits to the factories.

A severe typhoon disrupted the first week of the projects. Trees were uprooted, blocking the streets and making travelling to the factories difficult. Power supplies were disrupted for the whole week.

The students commenced collecting information but the three factories were fully operational only at the beginning of the second project week.

The projects required the students, working as a team, to:-

- establish Standard Times for one garment in one working group
- build on an Operations Schedule giving:-
  a. Target Productions
  b. Operatives required
  c. Potential cost per garment

- eliminate or combine operations through workplace engineering
- establish the present cost per garment and comparative saving
- check the work in progress which has a preculiarity about it due to the group system of manufacture

The student groups performed well, and commenced writing their reports. These, of course, were in Chinese and so the translated version was not available at the end of Phase 1. However, from observations the objectives set had been achieved and the main purpose of allowing students to put theory into practice had been very successful.

During this Phase, no pressure was exerted to encourage the students to discard the present factory practise of group system manufacturing. The obvious disadvantages would become evident during the discussions of the reports during Phase 2.

III. PHASE 2

This Phase was originally intended to take the training a stage further, and carry out more ambitious projects but this time with any changes identified being implemented.

The Phase commenced on 26 September 1988. Immediately, problems were experienced in two of the factories. In the Shirt Factory, the man designated as Production Engineer took time off to arrange a wedding, and the management substituted him with an untrained replacement, thereby illustrating the total lack of understanding of what we were trying to achieve and why the training had been necessary. The collection of information upon which to base any sort of accurate assessment was, to say the least, limited.

The Childrens Factory chose this time to commence a major building programme to raise the building by an additional floor. This meant that the existing top floor had to be stripped and the machinery deposited wherever there was room for it around the factory. The building plan had been known for many months, and new machinery had been ordered, but these facts were not communciated to the TGTDC, or if they were, they were not passed on to either the C.T.A. or myself.

If this disruption had been known in advance, a project could have been formulated to help the factory to operate efficiently through the period of disruption. The machinery being dumped haphazardly and a general lack of willingness to make changes, severely limited the prospects of successful project work.

The Pilot Plant, fortunately at this stage, was working normally, and work commenced to redesign the production area to incorporate Flow Line production, based on a re-engineered jacket, reducing the actual minutes from 190 to 93 Standard Minutes - giving an actual time of approximately 100 minutes; a saving of 47%. Further savings were planned in the manufacture of the linings.

During the C.T.A.'s October visit, he was shown all three factories and appraised of the operating problems.

On 26 October the C.T.A. called a meeting of the managements of the three participating factories and the TGTDC management. He covered the reasons for the project work, the problems and a revised work plan for the projects. This meeting is reported in the C.T.A.'s report of October 1988. The management seemed to accept the C.T.A.'s comments, and admitted shortcomings.

In two of the factories, good progress was made to the end of Phase 2. In the Childrens Factory, activity ceased when the TGTDC staff member departed for Fellowship training in the U.K.

The Pilot Plant, in addition to the improvements mentioned above, reached an agreement with management to move from Group Production to Flow Line, backed up by a manual overhead transporter system. The factory layout was planned using scale diagrams and templates, and a Flowline incorporating two of the working groups was also planned. However, right at the end of Phase 2 (first week of December) it was announced that because of cash flow problems, the factory would be moving away from the making of jackets and trousers, and would adopt a policy of making anything for customers who would pay "on time".

This meant that the implementation of all the careful planning had to be shelved indefinitely.

The Shirt Factory started slowly, partly due to frequent absences by the TGTDC staff member, plus the continued use of the untrained substitute for the absent trained Production Engineer. The lady concerned was an enthusiatic worker, but the information she gathered was not wholly accurate. Even the TGTDC management appeared not to recognise that enthusiasm is no substitute for training.

Eventually, time standards were established and again, agreement reached to incorporate four working groups into a Flow Line. The new standards would result in an improvement in time of 43%. The finalisation of the improvements could not be made right at the end of Phase 2 because of the absence of the TGTDC staff member acting as interpreter in the Shirt Factory.

IV. PHASE 3

Phase 3 commenced on 9 January 1989. The objective of this Phase had been to "tidy up" and where possible assist the factories in preparing plans for future work or improvements. This would also have provided a basis for the work of the Management expert, due to take up his assignment in April. With the problems experienced during Phase 2, or looming on the horizon, the chances of much forward planning were very slim.

The Pilot Plant had changed some machinery into a Flow Line layout but on a reduced scale from the original plan. This resulted in most of the operatives working a Group system within a Flow Line layout. The company claimed that there was some improvement in production.

A training session was arranged with the factory supervisors to try to get them to use the new layout to the best advantage. No member of management was available at this meeting, in fact the Production Engineer (a very good practitioner) was in northern China collecting bad debts!

Further training and an attempt to balance the production line was foiled due to a lack of fabric. Fabric was not available until the very end of Phase 3, which coincided with the run-down to the Spring Festival holiday. In any case, the factory was unsure of which product would be made when the cloth did arrive.

The Shirt Factory appeared to have experienced some reaction from the shop floor to the proposals for changing the factory layout, and the plan was again "in limbo". Eventually, the factory manager did agree to consider proposals for a reduced layout. Much of the original work had to be done again. The revised plan is for the 46 operations to be spread over 25 operators. The potential reduction in time is from 62 minutes to 33 minutes, an improvement of 46%. I do not think that the workers will accept it, and the management position, even if there were total commitment, is not strong enough to force the issue.

The Childrens Factory is still being reconstructed and suffering for short time working, so there is no progress at all.

During Phase 3, the Centre did manage to organise a Management Seminar on the 24 January 1989, having failed to organise one in November 1988. It was attended by 36 participants, including the Director of Light Industry. The subject matter (see attached programme) was well received. If this had been arranged when it was recommended by the C.T.A. in the Action Plan, maybe a different reaction would have been experienced in the factories.

V. CONCLUSIONS AND OBSERVATIONS

I am not at all satisfied with overall progress during the assignment. With the exception of the delay caused by the late arrival of the stop watches, Phase 1 went very well. I think this was largely due to the fact that the bulk of the activity was a training course - an activity that is highly structured and therefore not prone to too much "local" interference.

Phases 2 and 3 depended largely on a high degree of understanding and commitment, particularly from the management of three factories. In addition, "local" conditions played their part.

One of the major stumbling blocks will always be the labour force. Workers are set in their ways, and their attitudes towards suggestions of improving performance will be extremely difficult to change. Why should a person produce more work for the same amount of pay? Incentives are understood and many newspaper articles have been produced about how incentives are achieving improvements. The fact remains that incentives as we know them in the western world would be difficult to introduce into China while ever the present system of payment is in force. The bulk of a Chinese workers monthly income appears to be made up of fixed allowances for food, housing etc. Therefore incentives based upon the earned part of that income will be so ridiculously small as to be hardly worth the effort.

There is a desperate need to train management and open their eyes to the possibilities of improvement through change. The factory system was devised in the West. It will not function effectively and competitively if operated to Eastern concepts. This fact must be clearly understood by all concerned with this project, particularly the management of the TGTDC whose task it is to convince their compatriots to accept the existance and value of the TGTDC in helping to improve the standards and performances of garment manufacturing enterprises throughout China.

The Centre itself is suffering from a lack of identity, possibly due to the fact that it is occupying temporary premises, whilst the new building is being constructed. When this building will be completed is a matter for grave concern, as it is rumoured that the priority has been reduced; and newspaper articles indicate that the building programmes nationally are being greatly curtailed. If the TGTDC new building is axed from the building programme in Hangzhou, then it is certain that the Centre will be operationally less effective in the future.

My thanks go to all those who have worked with me and given me assistance during the whole of my assignment.

APPENDIX 1

PRODUCTION ENGINEERING & MANAGEMENT

MANAGEMENT SEMINAR

Tuesday 24 January 1989
Friendship Hotel, Hangzhou

1. Introduction - TGTDC Director
2. Opening Address - Consultant
3. Line Management
4. Production Engineer
5. Basic Method Study
6. Work Measurement
   - Time Study
   - Standard Times
   - Order of Operations
   - Operatives required
   - Production Flow
   - Incentives
7. Line Balancing
8. Labour Cost Control
9. Quality Control
10. Improving Sewing Methods
11. Operative Selection and Training
12. Supervision
13. The Production Engineer
14. The Challenge - the ability to buy (Backward Integration)