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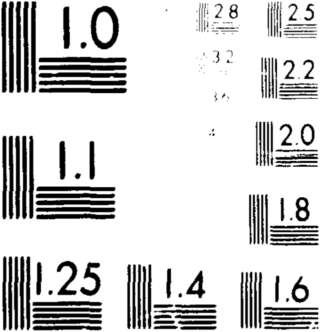

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UNITED NATIONS INDUSTRIAL DEVELOPMENT ORGANIZATION

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JUTE INDUSTRY DEVELOPMENT PRODUCTIVITY IMPROVEMENT IN BANGLADESH

(UNIDO CONTRACT N° 77/105 - PROJECT N° DP/BGD/73/043)

FINAL REPORT

VOLUME I

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MILAN, JUNE 1980

20. Nov. 1980

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1. INTRODUCTION

The main objective of the contract between UNIDO and Borghi & Baldo was "To achieve a better use of the productive capacity of the Mills".

These ends can be gained by taking action with regard to the following main factors:-

- raw materials and processing;
- machinery, installations and maintenance;
- manpower and training;
- organization.

Each of these factors has particular characteristics in the case of Bangladesh, of which those most outstanding are:-

- erroneous processing of raw materials, especially during the first steps;
- irrational utilization of plant and machinery;
- inefficient maintenance;
- low, average qualifications of man power;
- poor organization.

The Borghi & Baldo Productivity Team has drawn up reports, on these points, making, too, concrete proposals and suggestions as to how the problems could be resolved.

The four Pilot Mills were the object of particular attention, an in-depth analysis of the initial phases of jute processing, which is of fundamental importance, was carried out for these Mills.

Each single step was critically examined and the errors were pointed out and explained. Practical proposals and suggestions as to how these errors could be remedied, were made for each step and with an aim to achieve:-

- better quality;
- greater productivity;
- a more rational utilization of plant and machinery.

The proposals and suggestions made could constitute a short and medium term plan of action.

The practical application of a few simple proposals led, in some mills, to improvements in production, quantity and quality.

The Borghi & Baldo Productivity Team recommends that any future action taken also be concentrated on these problems.

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2. GENERAL INFORMATION

A. Reports Submitted

During the 54 man-months spent in Bangladesh, the Team drew up and forwarded the following reports:-

1. On General Matters

   N°. 16 Diagnostic Reports, one for each of the Mills initially foreseen in the Contract. (See 1st. Progress Report, 1st. Interim Report, 2nd. Progress Report.)

2. On Organization

   Draft Organization Charts and Job Descriptions relative to three Mills. (See 1st. Interim Report.)

   Proposals for Organization Charts and Job Descriptions relative to eight Mills. (See 2nd. Progress Report.)

3. On Processing

   A letter dealing with Emulsion problems.
   (See 1st. Interim Report.)
   A report on Morrah weights
   (See 3rd. Interim Report.)

A report on Emulsion
(See 3rd. Interim Report.)

A report on Softeners/Spreaders and
Emulsion application
(See Annex I.)

Reports on : Bangladesh Jute Mill
Dacca Jute Mill
Platinum Jubilee Jute Mill
Chittagong Jute Mill
(See Annexes II-V.)

4. On Maintenance

A Technical Check-list
(See 1st. Interim Report.)

Report on maintenance for Jute Milis in
Bangladesh
(See 2nd. Interim Report.)

A report on mechanical checks in Bangladesh
Jute Mill, Dacca Jute Mill, Platinum Jubilee
Jute Mill and Chittagong Jute Mill.
(See Annexes VI - XI.)

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5. On Training

A survey on existing training facilities and proposed training approaches (See 1st. Progress Report.)

A survey on existing training facilities and proper approach to training (See 1st. Interim Report.)

A short training course relevant to initial phases of processing (See Annex XX)

Apart from any results already achieved during the project activity, we trust that all the above documentation may also serve to:-

- heighten consciousness in the sector as regards the various problems to be tackled;
- achieve a correct assignment of priorities;
- better the average technical skills and knowledge of staff in Bangladesh.

In fact the project can be considered as being entirely successful only when these objectives have been accomplished.

B. General problems of the Jute Industry in Bangladesh

A few general remarks, about the peculiar problems of the Jute Industry in Bangladesh, should be made in advance and borne in mind.

The aim of any industrial enterprise is to be profit making, using correctly all the factors which constitute the production process.

This should be particularly the case for the Bangladesh Jute Industry since, as is well known, the country has few natural resources if compared to the population, and jute is the most important locally available raw material.

On the other hand the Jute Industry is, without a doubt, the most important industry in Bangladesh due to the number of factories and employees, to the export value and to the fact that this industry induces many other activities.

It is well known that local Bangladesh management of this industry in the years following Independence incurred heavy financial losses.

Synthetically, the losses were caused by a heavy disproportion between selling and cost prices, where raw materials alone made up more than 60% of overall costs.

It should be noted that this is not normally the case in industrialized Western countries where working expenses generally constitute most of the costs.

The Bangladesh Jute Industry must therefore make every effort to reduce its costs as far as possible in order to bring them closer to the selling prices.

As is known, there are many different qualities of raw jute. The best qualities are the softest and easiest to spin but are more expensive. The poorer qualities (which are harder and more difficult to spin but which cost less) usually require greater care and attention right through from the jute preparation phase up to spinning.

It is also a known fact that the yarns, and therefore the jute end products, are normally obtained by combining different qualities of raw jute.

A proper balance between total cost of raw materials, mill efficiency and working costs is the objective that should be gained.

As has already been mentioned, the cost of the raw material alone accounts for 60% of the total costs.

An attempt must therefore be made to use, as far as possible, low cost raw materials which implies the use of greater quantities of low quality raw jute.

At the same time, the quality of the product and processing efficiency must be kept to as high a level as is made possible by the circumstances.

The initial phases of the process consequently take on an even greater importance since they must be carried out with the highest degree of accuracy and care possible.

The fact that there has recently been a sudden rise in sales prices, to the point that costs are covered even with good margins, doesn't substantially change our analysis.

This can be confirmed by recent statements in the local papers (see Annex XI - Bangladesh Observer).

The achievement of the above would lead to having even greater quantities of good quality jute available for export at high prices.

C. Productivity in the Bangladesh Jute Industry

The textile industry in general, and the jute industry in particular, have reached very high productivity levels in Europe.

We should like to mention at this point the allotment of the machinery which in the jute industry can be summed up as follows:-

- no less than 2 carding machines per person;
- two or even four spinning frames per person;
- at least two looms per person.

This is made possible by the co-existence of a few determining factors, such as:-

- precision. regularity and uniformity in the working cycle;
- machinery and plant kept in good condition & subjected to proper maintenance;
- high average qualifications of workers.

On the other hand, in Bangladesh one machine only is assigned to a worker (one carding machine, one spinning frame, one loom etc.).

We do not think, however, that conditions are too suited to the assigning of more machines per worker, to achieve higher productivity.

The reasons are essentially of :-

- a social nature, since the employment rate is still very low in Bangladesh;
- a technical nature, since the processing cycle is very often irregular, the product greatly lacking in uniformity, the machinery badly kept, in a bad state of repair and badly utilized;
- of an economical nature, since the total cost of manpower accounts for only 18% of costs, whilst the raw material accounts for 60%.

The productivity of the jute industry in Bangladesh is therefore dependent on the following main factors which are in some ways connected to one another:-

I. Raw Materials

The importance of the problem has already been mentioned previously (see Chapter 2.3). Unfortunately, the attempts being made to resolve the problem in Bangladesh cannot be said to be adequate.

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Processing is, in fact, nearly always irregularly and incorrectly carried out.

There are more manual operations than there need to be and same are always unchecked. In particular, the processing of uncut jute is always subject to inappropriate treatment, sometimes unnecessary machine operations , incorrect conditioning and, on the whole, is greatly irregular.

II. Manpower

The most serious problems in this respect are, in our opinion, due to the average low level of qualification (at least 60% of the workers are illiterate), to high absenteeism and to high turnover without adequate training but this is not a problem that can be solved by sectorial assistance.

III. Machinery and installations

We are of the opinion that the main problems lie in:-

- lack of proper maintenance;
- irrational use of machinery and plant.

IV. Organization

At Mill level, the key jobs have not all been filled, neither have responsibilities been clearly defined and allocated to the various levels.

This results in the system being largely incapable of drawing maximum advantage from machinery, plant and raw materials.

D. Performance of the Contract between UNIDO and Borghi & Baldo

The Contract foresaw, at the beginning, that the work be carried out in 16 Mills, chosen as representative models of the entire B.J.M.C.

The survey phase of the 16 Mills selected was finished by the Borghi & Baldo Productivity Team in April 1978.

After said phase was completed the important decision to concentrate the Team's activity on 4 carefully chosen Mills was taken.

This decision was made together with the UNIDO Project Manager, World Bank Officials and B.J.M.C. officials.

The above Authorities recognized, in fact, that, keeping the available task force in mind, an attempt to tackle all the different situations existent in the various Mills would have greatly delayed results and made same much less tangible.

The Team therefore started their direct assistance in the Mills in the month of July 1978 with the intention of covering the complete working cycle in the remaining period of activity.

An initial investigation of the Mills operations led to the conclusion that it was recommendable to concentrate the Team's action on the 1st processing steps.

In fact when texts and analyses were examined more closely it was realized that there were too many faults and defects in the first critical steps of the processing (see Second Progress Report D-22-27).

It is to be noted that the faults and defects are made evident by the following main factors:

- very high number of breakages in the spinning department;
- very strong, irregular fluctuations of the sliver c.v. (coefficient variation) when passing from the finisher cards to the drawing frames;
- high, irregular sliver c.v. made by the breaker cards.

Tests and surveys made by the Team and its counterparts have clearly shown that the above are mainly due to:-

- non-uniform selection of raw jute;
- unstable emulsion;
- uneven application of emulsion to the jute;
- incorrect piling and maturing of the jute;
- machinery, from softeners to spinning frames, in bad mechanical condition and wrongly set;

- incorrect working methods of the workers assigned to machines, particularly those machines which are most specifically fed manually, such as softeners and breaker cards.

We should like, once again, to point out that the processing of the so called uncut jute is one of the definite, main causes of irregularity and inefficiency (see Third Interim Report C-12).

On the contrary, the processing of cut jute, enabling to use different treatments for the soft and the hard part of the jute, results in correct operation of emulsion application, piling and carding, which is not achievable when processing uncut jute.

Lastly, from another point of view, it can also be said that faults and defects are mainly to be put down to:-

- inadequate basic technical knowledge;
- erroneous, backward ways of working;
- very little tendency to go to the root of technical problems;
- lack of checks and supervision.

We wish to draw attention to the fact that the processing of jute is carried out in such a way that eventual errors in the first phases have a determining influence on the output of the entire process.

This is particularly true of the situation in Bangladesh which imposes the use of low quality raw materials wherever possible.

The processing of inferior quality raw materials requires more care and attention right from the very first processing stages i.e. in the spinning preparation phase.

In June 1978 (see First Interim Report - AnnexX/17) the Team prepared and submitted a memo on the problems of the emulsion since, from the beginning, they had encountered fundamental problems and rough and sometimes incorrect basic knowledge on this matter.

Bearing the above and other relevant matters in mind the Team decided to look into the whole programme once again. In fact, it is advisable to go on to spinning, weaving preparation, weaving and finishing only after stable results have been obtained in the first part of the process. The Team therefore considered it recommendable to concentrate on an examination, in greater detail, of the technology of the first processing steps. This would enable obtaining of maximum possible long lasting results, operating almost exclusively on the process.

Therefore the activity of the Team was directed essentially to the problems of morrah selection and subsequent processing steps, piling included. The working operations concerning cut and uncut jute were also considered.

For the four Pilot Mills each step was deeply examined and discussed in detail.

The foreseen training programme was also changed to fit in with this new general approach (see Third Interim Report - Annex 20).

The action suggested had the common goal of improving the quality, the uniformity and the quantity of production in view of achieving a global productivity improvement in all working operations.

In some cases the modification of the existing way of operation has a tangible cost, which however is of scarce significance to the final production cost and should be confronted with the achievable improvements of the whole process.

For example at the Dacca Jute Mill the use of 0.5 ÷ 1.0% of emulsifier, instead of 0.1% as previously adopted, resulted in an improvement of about 20% of the global yield.

As another example, at Chittagong Jute Manufacturing Co. Ltd. Mill the adoption of only part of the Productivity Team's suggestions about emulsion preparation and application resulted in a reduction of daily emulsion consumption of about 25%.

3. ACHIEVEMENTS

A. Suggestions and implementation

The contents and consequences of the different reports delivered by the Team will be examined in this chapter.

We will draw in this way a clear picture of:-

- the suggestions made by the Team
- the results obtained, when the previous suggestions were put in operation.

I. On Organization

Organization chart and job descriptions have been made up for the following eight mills:-

- Dacca Jute Mill
- Bangladesh Jute Mill
- Platinum Jubilee Jute Mill
- Chittagong Jute Mill
- Crescent Jute Mill
- Star Jute Mill
- Amin Jute Mill
- S.K.M. Jute Mill

All jobs have been defined and details have been given on production and maintenance sectors.

Organization principles such as:-

- proper delegation of power
- suitable range of control
- all key jobs filled

were used as basic criteria when drawing up the organization charts.

Five different levels of duties and responsibilities have been taken into proper consideration:-

- General Manager (responsible to the Board of Directors)
- Manager (in charge for the main functions, i.e. raw material purchase, production, administration and finance)
- First Level Officer (responsible for a specific sector, i.e. Maintenance Engineer)
- Second Level Officer (in charge of the supervision of a group of activities)
- Third Level Officer (in charge of the supervision of one single activity).

The organization charts and job descriptions are suitable for any corporation mill since the positions are very similar.

The Team suggested also some new positions, such as:-

- Technical Officer
- Work Study Officer
- Organization Officer.

The Team feels that it would be very useful to fill such posts, since the previous duties have not been foreseen in the present organization systems of any of the mills.

These charts and job descriptions were discussed with the management of each of the recorded 8 mills.

To-date no information was received as to whether the proposals have been approved by B.J.M.C. and if they have been put into practice.

II. On Processing

a) Report on Softeners /Spreaders & Emulsion Application
(see Annex I - Present Report)

The purpose of this report is to establish some fundamental concepts on the first mechanical operation the jute undergoes on the working cycle and on the machines utilized at this stage.

Therefore the report takes into consideration, both for softeners and spreaders, the effect of the mechanical action on the fibre, the different characteristics of the two machines, the mechanical conditions and the maintenance problems.

Finally the report points out the practical Team advices, suitable for each of the 4 Pilot Mills, such as:-

1- training of the feeders, in order to obtain a feeding ratio the more uniform as possible.

   Practical training was put in operation by the Team in each of the 4 mills and the final results compared with the figures detected at the initial stage.

2- need of a double feeder for the softeners, in order to reduce gaps between the different morrahs and therefore decrease emulsion wastages. Taking into consideration the 4 P.M., the Team was able to run different tests on this subject: Chittagong J.M., at the end of the Team work, was already practising normally this way of processing.

3- need for a ratio between feeding and delivery speed of the softeners. The Team was able to run tests on the actual speeds of the different machines in operation in the 4 P.M. and to give practical advices in order to regularize the same.

4- need for control of emulsion flow both for softeners and spreaders: on this subject the Team was able, after running different tests in different periods, to draw Flow Charts of emulsion for each of the 4 P.M. Previous to the Team work, those Charts were completely missing and the production management was in no way able to control the quantity and the continuity of the emulsion flow in his own mill.

5- need for a complete maintenance program for the running machines: the Team was able to draw a complete technical picture of the softeners and spreaders in operation in the 4 P.M. and to suggest the maintenance work needed for each of the previous machines.

The Report is complete with record of different tests, diagrams and calculations.

b) <u>Report on morrahs weight</u> (see Annex XV - Third Interim Report)

The purpose of this report is to point out to the Mill Managements the need of regular checkings on the weight of the morrahs to achieve the highest possible ratio of regularity.

The initial situation, at the beginning of the Team work, showed:-

- different standards of weight from one mill to another, in spite of BJMC circulars on this matter
- no control on regularity of morrah weights
- no training of workers.

The Team carried out in all the 4 P.M. a training course at workers level, course which lasted for some months gathering very good results: i.e. in Dacca J.M. the regularity increased from an initial standard weight of 38% to a final standard weight after training of 84%.

The main advice of the Team to the Mill Management was to consider the control system at this level of the work cycle a normal routine of the mill organization, together with a normal training stage of the workers involved.

c) <u>Report on Emulsion</u> (see Annex XVI - Third Interim Report)

The purpose of this Report is to point out to the Mill Managements the need of a correct emulsion in order to increase the productivity of the spinning department.

The initial situation, at the beginning of the Team work, showed:-

- different characteristics of the batching oil employed by each of the 4 P.M., with no fixed chemical standard delivered to the suppliers;
- different types of water employed by each of the 4 P.M.;
- different types of emulsifier employed;
- wrong percentage of employ in the use of the emulsifier.

The Team carried out in all the 4 P.M. a long series of tests, regarding the quality of batching oil supplied to the Mills, the quality and percentages of different emulsifiers (imported or locally made), the quality of water employed in the emulsion process.

For some problems the Team was able to produce specific advices:-

- for the batching oil, a chemical standard was recommended to the Corporation and quality control was requested to the single mills;
- for the quality of water, the use of condensed water was recommended.

Instead practical improvements were achieved by the Team with the use of correct percentages of suitable emulsifiers: i.e. in Dacca J.M. from an initial percentage of 56% of decomposition of the emulsion after 24 hrs, the Team reached an 8% of decomposition at the same conditions, by increasing the percentage of emulsifier from the initial 0.125% to a 0.30%.

Another achievement of the Team was the issue of a B.J.M.C. circular, standardizing the use of a single type of emulsifier in all the Corporation Mills.

d) Particular Report on Dacca J.M.

A detailed Report on some basic points of the working process was submitted in July 1979 (see Annex III Present Report).

The report analyzed in detail the following problems:-

- morrah weight;
- preparation and stability of emulsion;
- emulsion application and wastage;
- piling and processing;
- beaming;
- general considerations on supervision.

The Team, on the ground of the different tests run in the Mill, was able to deliver the following advices:-

1- recommendation about the need of daily checkings of the morrah weights in order to still improve the results (due to the Team advice, the standard regularity increased from 38% to 56%);

2- recommendation, during the emulsion preparation:

   ° for the use of condensed water

   ° for the increase of the emulsifier percentage in order to still improve the stability of the emulsion

   ° for the maintenance and regular cleaning of emulsion plant and pipelines.

   Due to the Team advice, emulsion decomposition after 24 hrs decreased from 56 to 8%.

3- recommendation for a correct emulsion application:-

- the softeners should be fed only by double feeder;
- the speed of the machine should be proportionate to the average length of jute employed;
- the emulsion flow should be adjusted by proper gauges valves (those valves were in fact properly constructed by Team suggestion on the Mill workshop);

4- recommendation for a correct piling:-

- all types of jute should be piled: due to lack of space on the mill floor, the Team adviced the Management to put in working operation a spreader, which lies idle in the mill, with the consequence of decreasing the period of piling and of less floor space needed for the piling itself;
- increase the piling period for the rooted jute;

5- recommendation for a correct beaming:-

- the creels of the beaming machines should be altered in order to achieve a uniform rotation of the spools.

The Report was object of a meeting, with the attendance of Mr. Aminul Haque, General Manager of B.J.M.C., P.P. Department and the Mill General Manager Mr. K.R. Hassan.

As a result of the application of only a few of the suggestions of the Productivity Team, in the second half of 1979 the Dacca J.M. incremented the spinning average yield by about 15%.

A final Report on the implementation of suggestions of the Team was directly drawn by the Mill Manager in January 1980 (see Annex XIV).

c) <u>Particular Report on Bangladesh Jute Mill</u>

A detailed Report on some basic points of the working process was submitted on 28/6/79 (see Annex II Present Report).

The Report discussed in detail the following problems:-

- morrah weight;
- emulsion preparation and stability;
- emulsion application;
- piling process-
- general considerations about supervision.

The Team, on the basis of the number of tests run in the Mill, was able to deliver the following advices:-

1- regular checkings on the morrah weight. The Team tests showed at the initial stage an average weight not in line with the standard weight fixed by Corporation and moreover a 40% percentage of weights out of the standard. During the training carried out by the Team this percentage raised to 77%: in the meantime Mill Management agreed to apply the Corporation standard weight;

2- recommendation, during the emulsion preparation:-

   ° for the use of condensed water;

   ° for the increase of the emulsifier percentage in order to improve emulsion stability.

   On this subject the Team was able to convince Mill Management to shift from local made emulsifiers to well known emulsifiers, showing the results of many tests where the percentage of decomposition after 24 hrs dropped from 48 to 4.75, and still less to 2.5 with the use of condensed water;

3- recommendation for a correct emulsion application:-

- drop of the "Dripping system" on the spreaders, which is normally equipped with Spray Jets systems: the Mill Mgmt agreed to ask the machine makers for a new supply of the original system;

- overhauling of softeners and spreaders: the Team was able to submit to the Mill Management a complete picture of the present worn-out conditions of the machines, and asked for an intervention on emergency basis. The Mill Mgmt was considering the problem on the budget basis of the Mill, and agreed for some of the most urgent replacements, which were carried out under the Team control;

- drop of the dipping system: the Team proposed to the Mill Management a different processing cycle, with the final aim of a reduction in emulsion consumption and in wastage, cycle which was tested by the Team itself and the results duly recorded;

4- recommendation for a correct piling process:-

- control of the piling time for all types of jute at work, on the basis of various tests;

- proper use of piling process. The Team found out different ways of piling on the mill floor, such as spreader rolls made by jute already piled. The Team submitted to the Mill Management the proper scheme of piling;

5- recommendation for an increased supervision from batching to carding line.

On 5/7/79 a meeting was held to discuss the Team Report at the presence of Mr. Aminul Haque, General Manager B.J.M.C.,P.P. Department, of the Mill General Manager Mr. A. Alì.

A final Report on the implementation in the Mill of the Team advices was compiled on the 17/2/80 and signed by the Mill Management (see Annex XIII).

f) Particular Report on Platinum Jubilee J.M. - Khulna

A detailed Report on some basic points of the working process in this Mill was submitted on 19/10/79 (see Annex IV Present Report).

The Report discussed in detail the following problems:-

- morrah weight;
- emulsion preparation and stability
- emulsion application;
- piling;
- cycle of processing for hard and soft jute;
- beaming;
- winding.

The Team, on the basis of various tests and checkings made in the Mill, was able to submit the following advices:-

1- regular daily control on the morrahs weights, not at random as practised but for individual worker. The Team tests showed at the initial stage an average of about 40% of weights out of the standard, a problem not only technical but also tied with wages situation of the Department.

The Team on one side carried out practical training courses increasing the percentage of standard weights to 65%, on the other contributed to solve the problem of the wages at Corporation level;

2- recommendation, during the emulsion preparation:-

° for the use of condensed water (tests run by the Team showed a clear increase in stability time of emulsion). On this subject the Team suggested the Mill Mgmt to provide the Mill with a plant of water softening;

° for the correct use of emulsifier. The Team checked the habit of diluting the emulsifier with water previous to the final mixing: this habit was in contrast not only with the Team advices but also with those of the emulsion plant manufacturer;

° for complete overhauling of the 4 Rapisonic Plants installed in the Mill with the consequent possibility to move to another mill, equipped with conventional old plants, 2 of the Rapisonic Plants: the Team submitted to the Mill Mgmt all the calculations probing that 2 Rapisonic Plants, in normal efficiency, were quite sufficient to cover the Mill needs. In the meantime the Team presented a technical Report on the mechanical conditions of the emulsion Plants, giving on this way a guideline for the overhauling work;

3- recommendation for a correct emulsion application:

° increase the use of spreaders, some of them checked by the Team 02 idle 02 at low level of working efficiency;

° minimize the manual system of emulsion application, with consequent decrease of wastage, and more correct percentage of oil in the rooted parts of jute: by tests run by the Team it was possible to detect a 4.4% of oil against the normal one of 8-9%;

4- recommendation for a correct piling:-

° all the jute grades should be piled and the time of piling should be regular (the Team checked variations from a minimum of 35 rolls on pile to a maximum of 125);

° the temperature of piles should be checked regularly (by tests run by the Team, it showed up that some grades were put under piling by excess);

5- recommendation for a correct cycle of processing:- the Team was able to check 4 different working cycles for lifferent types of jute, from soft to hard, applied on the Spinning Department and to submit to the Mill Mgmt his own proposed cycle, according to the most up-to-date processing way;

6- recommendation for beaming:- the Team checked the presence on the Mill floor of a complete modern pre-beaming machine, standing idle due to problems of proper maintenance. The Team suggested therefore the Mill Mgmt to reactivate this system, with no possible comparison, in quantity and quality, with the actual production from old type machines;

7- recommendation for winding:-
the Team checked that yarn bobbins are delivered from the spinning frames without the normal tag-end, device supplied by the machine makers, and therefore the rolls winding machine is fed by a single bobbin instead of the 3 possible ones. Moreover all the stop motions of the roll winding, were out of order.
The Team suggested to reactivate both the tag-ending and the stop motions in order to achieve an increased productivity on the Winding Department.

On the 17/11/79 the Report was discussed during a meeting in Khulna, attended by Mr. A. Haque (General Manager of P.P. in B.J.M.C.) and the General Manager of the Mill, Mr. A.K.M. Shamsuddin: the B.J.M.C. Representative requested the Mill Management "to implement the Productivity Team proposals for the greater interest of the Mill".

A final Report on the proposals of the Team already applied by the Mill Management was reducted on the 18/2/80 and signed by the General Manager (see Annex XVI).

g) Particular Report on Chittagong Jute Mill - Chittagong

A detailed Report on some important problems of the working process in this Mill was submitted in November 1979 (see Annex V Present Report).

The Report discussed in detail the following problems:-

- morrah weight;
- emulsion preparation and stability;
- emulsion application;
- piling;
- cycle of processing.

The Team, on the basis of various tests run in the Mill, was able to submit the following advices:-

1- regular daily control on the morrahs weights, not at random as practised but for individual worker. The Team tests showed in this Mill 3 different standards for the morrah weight, according to 3 different types of jute, and a range of percentage of standard weights varying from 56% to 65%. The Team adviced the Mill Mgmt to choice only one standard weight for all types of jute and moreover practical training courses were run for the workers of the Department, increasing the average percentage of standard weights to 97%. It is easily assumed that those results were possible due to the fact that in this particular Mill a certain amount of control was already in operation, in opposition to the situation in the other 3 Pilot Mills;

2- recommendation during the emulsion preparation:-

   ° for the use of condensed water, with the suggestion of the installation of a suitable water softening plant;

   ° for the use of correct percentage of emulsifier and for the choice of one well defined emulsifier: the Team checked the use in the Mill of different emulsifiers, both locally made and imported ones, and the use of percentages not even in accordance with their technical characteristics: many tests were run on different types of emulsifier to provide the Mill Mgmt with the most wide range of results to allow the same for a right final choice;

° for a correct emulsion plant: the Team checked the total inefficiency of the Conventional Plant installed in Mill no. 1 and suggested a new type of plant: this plant has been already installed and put to work, and the results supported the Team advices with an emulsion decomposition after 24 hrs decreasing from an average of 65% with the old plant to an average of 5% with the new plant. In the meantime consumption of emulsion decreased in the Mill about 25%;

3- recommendation for a correct emulsion application:-

° for good maintenance of metering units: the Team checked the worn-out conditions of the metering units, with no possibility to adjust the emulsion fluxes on the different machines. The Team was able to carry out the overhauling of one softener and to draw the correct flow chart of the machine, showing in this way to the Mill Mgmt the future work to apply to all the machines of the Department;

° for the use of double feeder: this advice of the Team is now a rule on the Department. The Team ran also a training course of the feeders to adopt a feeding rythm the more uniform as possible;

° for the use of daytime shifts: to improve the supervision and therefore the productivity of the machines, the Team suggested a work as much as possible concentrated during daytime shifts;

4- recommendation for a correct piling: the Team checked that the quantity of jute under piling was correct, but running many tests on different grades in different periods of the year it showed up that the temperatures reached during the piling were irregular both for grades of jute involved as for seasonal periods: the Team adviced for a constant percentage of oil but for a variation of percentage of water in emulsion in connection with the moisture content of the fibre due to the humid or dry season, and also for a correct piles insulation in enclosed spaces;

5- recommendation for a correct working cycle: the Team checked the 4 processing cycles applied in the Mill to the 4 main batches and submitted to the Mill Mgmt his own 2 processing cycles, according to the most up-to-date processing way and to the final aim to achieve the same productivity at lesser costs.

The Report was discussed at a meeting held in Chittagong, attended by Mr. A. Haque (General Manager of P.P. at B.J.M.C.) and by the General Manager of the Mill, Mr. A.H. Miah.

A final Report, dated 18/2/80, was drawn up and signed by the Mill Manager, describing the implementation in the Mill according to the suggestions given by the Productivity Team (Annex XVIII).

h) Conclusion

The Productivity Team efforts were concentrated mainly on the initial processing steps.

Some positive results have already been achieved in many fields from Batching Department to Spinning Departments.

Further improvements will be obtained through the full adoption of the suggestions of the Team, suggestions which, involving also budget problems in the single mills, can be considered as medium-term goals.

The improvement of the operations connected with the Preparing Departments showed already his positive effects on the Spinning Productivity.

Specific action for improving also the weaving section should be taken as soon as possible in order to achieve an acceptable level of efficiency through the whole production cycle.

III. On Maintenance

a) General Report for all the Jute Mills included in the Project

The Productivity Team forwarded the General Report to the Project Manager towards the end of 1978.

The Report covers the three aspects of both Mechanical and Electrical Maintenance, i.e.:-

- preventive maintenance;
- routine maintenance;
- general overhauling.

To the Corporation attention some points were specifically pointed out, as:-

- lack of supervision from the top levels of the single mills;

- lack of knowledge of the lower grade officers (moreover all the machines instructions are written in English and among the maintenance people only a few are able to read it);
- poor equipment of the mills workshop;
- poor training of maintenance engineers.

The Report also deals with problems concerning:-

- lubrication and greasing of the machines: the Team was able to detect that this operation is carried out in the most irregular ways, with consequent waste of oil and grease and moreover with specific mechanical parts of the machines worn-out;
- repinning section: the Team was able to detect that this costly section is completely forgotten by the Mill Management, running without any supervision and very often delivered not to qualified workers but instead to some boys just hired in the Mill;
- store keeping: the Team was able to control that in many mills, this department is not up-to-date with the modern system of the spare parts store so that often the Mill Management is not able to know exactly the position of some single spare parts needed for their own mill. The main advice of the Team referred to the need of computizing all the mills spare parts through the Corporation computer, so that their availability could be checked at once;
- workshop: the Team suggested the equipment and tools which were lacking;

- power factor: the Team checked that in some mills the power factor problem was completely forgotten, so that their electrical engineers were even not furnished with the power factor meter. Specific advices have been suggested to keep this particular problem under correct control;
- boiler house: the Team checked that in most of the mills this department was badly neglected, mainly for the lack of graduated boiler engineers. Specific advices have been suggested in order to keep under control an efficient treatment of oil, the water consumption and the quality of the same, the maintenance of steam and water pipelines.

The main aspects of the maintenance have been explained with particular reference to the following departments of the spinning:

- batching (emulsion plant and emulsion application apparatus);
- softeners and spreaders;
- carding;
- drawing.

For the single machines of the previous departments the Team submitted a maintenance programme on a weekly and monthly basis, together with lubrication instructions.

b) Mechanical Reports for Dacca J.M., Bangladesh J.M., Platinum Jubilee J.M. and Chittagong J.M.

Regarding the 4 Pilot Mills, the Productivity Team carried out a complete check-out of the conditions of the machines of the single spinning departments.

Those checks are not only submitting a complete list of details of percentage of worning-out of single parts of machines but are giving the Mill Management a clear picture of the situation of each department, so that the same could be able to draw a program of overhauling, when and where it appears necessary.

c) Short Comment

The part of the project relative to maintenance was performed in parallel to the work carried out for "Processing" and "Training" sections.
The Mill Mgmt and Chief Maint. Engineers were kept informed of the findings resulting from the checks made by the Team: the actual carrying out of the maintenance work was obviously left to the Mill Mgmt decisions.

IV. On Training

a) Training Practice

The Productivity Team, together with the local counterparts, gave a series of practical training demonstrations to the workers assigned to:

- morrah selection;
- softener feeding.

These training demonstrations were given in each of the 4 Pilot Mills: the purpose was to show the correct way of work in two processing moments particularly important, due to the prevalent weight of the human factor in both the operations, and to show how controls should be carried out by the Mill Officers.

The practical training was given therefore at the presence of the Mill Officers concerned, so that the Mills involved could carry on, as routine practice, those checks.

The results of both the practical training courses were quite satisfactory. For example, about the morrah selection, the Team checked a total of 118 workers for a total of 6456 tests. The percentage of morrahs within standard weight limits increased from 52% to 80% after the end of the training itself.

The Team work was also supported by the result of a new control carried out some months after the training: the percentage showed an average of 72% in the 4 mills.

b) Training Course

The Prod. Team delivered a training course for a period of 4 days in each of the 4 zones covered by the Project: all the Officers of the departments concerned, from the 16 mills covered by the Project, were invited to attend the course.

The training course covered the following subjects:-

- jute and its different qualities;
- morrah weights;
- emulsion;
- softening process and emulsion application;
- piling;
- way of processing for cut and uncut jute.

Training on those subjects was developed along the following lines:-

1- jute and different qualities:-

° jute culture;
° identification of jute fibre;
° defects of the fibre;
° properties of the fibre;
° classification in different grades;

2- morrah weights:-

° non-uniformity of standards;
° irregularity in controls and consequent need for training;
° type of practical training carried out by the Team and the local counterparts
° correct methods to achieve final results;

3- emulsion:-

° correct type of stability and control of the same;
° correct characteristics of the emulsion components (oil-water-emulsifier);
° tests carried out by the Team in the different mills;
° suggestions of the Team regarding the use of condensate water, the correct percentage of emulsifier, the temperature control;
° mechanical descriptions of different types of emulsion plants and relative suggestions on maintenance and correct use of the same;

4- softening process and emulsion application:-

- different types of machines available at this stage and Team suggestions about the use of the same in connection with the use of different types and grades of jute;
- correct percentages of emulsion application;
- way to draw a flow chart for each machine of the department and way to calculate the correct balance between the different components of the emulsion and the quantity of jute involved;
- control of emulsion wastage;

5- piling:-

- correct way of piling;
- control of periods of piling and temperature, according to different types of jute;
- description of tests carried out by the Team in the different mills;

6- way of processing for cut and uncut jute:-

- different ways of processing the soft portion and the hard portion of jute;
- differences in the steps of processing;
- recommended processing cycles.

The training courses were followed in each zone with great interest and the Team tried his best to rise discussions among the trainees, to allow the greatest possible exchange of information and opinions.

At the end of each course, a general meeting was held with the General Manager of each zone, the General Manager of the mills involved and also the Mill Production Managers.

A copy of the training programme was handed to each of the trainees.

c) Short Comment

During the Team work in Bangladesh, we developed the strong feeling of the necessity to supply all the technicians of the mills involved in the Project with some basic technical knowledge.

The training programme, covering the primary points of processing, was drawn up accordingly.

The most outstanding result of the necessity of the training was the achievement, by the local technicians assigned to the Team as counterparts, of the skill to:-

- employ advanced working systems;
- cope with single problems by a systematic approach;
- evaluate correctly the results of practical tests.

The local counterparts, at least the great majority of them, are at present able to continue the type of work carried out till now with the Team assistance and therefore to obtain practical results in the productivity field, results which could be gradually extended to all the Bangladesh mills.

The spreading to other mills of the working methods introduced by the Prod. Team will strongly depend on the support which will be given by B.J.M.C. to the local counterparts of the Team.

The last advice of the Team on this subject is to give them the duty of training other colleagues, so that the seeds of the work started during the Project will gradually spread for the benefit of the local jute industry.

In the meantime the Team was able to demonstrate that also the training at workers level was achieving good results, once suitable methods of survey and analysis of tests have been chosen.
This type of training is of the utmost importance, if the final aim of productivity increase should be achieved, and taking into proper consideration that among the workers the lack of basic training is quite striking.

Of course further assistance by experts would allow a higher rate of technical knowledge, due to the fact that many technical points of the complete processing cycle still need a more accurate training.

B. Project Activities

I. The Team

The project was started on 17th January 1978 and concluded on 24th February 1980.

The total time spent by the Team, over the period 17th January 1978 - 24th February 1980, indicated in days and man-months, is shown on the enclosed table (see Annex XXII attached to this report).

The movements of the experts making up our Team, over the period 1/6/79 - 24/2/80, are also given on the enclosed table (see Annex XXIII attached to this report.)

Any absences of the Team members are to be put down to annual vacations, necessitv of medical treatment in Italy or serious personal reasons.

Over the Christmas 1979 and New Year holidays, where both members of our Team were absent, precise instructions were imparted regarding the duties and working programmes of the Counterparts (see Annex XXIV attached to this report).

It will be noted that the time spent in the project area corresponds exactly to that stipulated in the Contract.

II. Counterparts

The number of man-days worked by the local counterparts, from the very beginning up to the end of the project, was 4,466 i.e. about 65.2% of the theoretical man-days foreseen (6,850 approx.).

Over the period 1st June 1979 - 24th February 1980, the total number of counterpart man-days was 1,654 i.e. approximately 82,7% of the 2,000 (approx.) man days which, in theory, were to have been worked.

As per the circular letter dated 9/5/79, the B.J.M.C. withdrew 3 persons from the Productivity Team (see Third Interim Report, page 2, para. A-2).

Thus, the Team of counterparts resulted as consisting of 10 persons instead of 12 as was foreseen in the Contract.

A successive circular letter, dated 4/6/79, (see Annex XXV attached to this report) issued by the B.J.M.C. assigned two new people as replacements in the Productivity Team, thereby fully reintegrating the team of counterparts.

These new counterparts were :

- Mr. Mir Anwar Hossain who did not accept his assignment;
- Mr. A. Kalam who joined the team on 7/7/79 (see Annex XXVI attached to this report);
- Mr. Hossain was replaced, as indicated in the B.J.M.C.'s circular letter dated 25/7/79, by Mr. Nurun Nabi who, however did not join the team until 11/9/79 (see Annex XXVII attached to this report).

C. Various Working Connections

I. With mill management

On the whole, we can say that our personal relations with the Mill managers were always satisfactory and friendly.

As regards working relations, we confirm our opinion that the managers are over-burdened with work that is not always inherent to Managers' specific tasks.

Fundamentally, we draw attention to the following points:-

a) the lack of an organization chart, with clear and correctly defined job descriptions and division of responsibilities, is very apparent, especially in the bigger Mills like Platinum Mill and Chittagong Manufacturing Co. Ltd. Mill.

   Neither can it be said that the Managers' specific duties are very clearly defined.

b) Personnel employed in the Mills was often found to be insufficient both as regards to the number of employees and to the qualifications of same. Furthermore, absenteeism is high and replacements are inadequate.

In our opinion a general personnel policy is lacking.

c) Negotiations with Workers' Unions are frequent and a great deal of the Managers' time is taken up by long, extenuating discussions even on problems of no great importance which, in our opinion, could be resolved at a lower level.

It thereby follows that the Managers are too busy to be able to go deeply into technical problems that arise in their mills.

We should also like to add that managers are often in charge of any one Mill only for very short periods at a time, owing to continual rotation from one Mill to another

This obviously makes any positive technical intervention impossible.

In fact, we should like to recall that, in the span of time covered by the Project, there was a rotation of the managers in 2 Pilot Mills out of four.

As a matter of fact, there were no change-overs of managers in the four Pilot Mills, during the last phase of our activity i.e. from 1st June 1979 - 24th February 1980.

These problems evidently influenced relations between the Team and Managers.

In fact it hardly ever proved possible to hold detailed discussions on the suggestions and proposals made by the Team and, consequently, to arrive at a better mutual collaboration.

II. With B.J.M.C.

We noticed that B.J.M.C. showed a growing interest in our work, especially during the last phase of the project.

Copies of correspondence between the Team and the Mill managers, as well as technical reports, have been sent regularly by the Team to the B.J.M.C.'s managers.

Each report on the individual Mills was followed by meetings attended by Mr. Aminul Hoque - General Manager of Production Planning in the B.J.M.C.

The reports and meetings were even solicited, especially in the cases of the large Mills.

We consequently believe that B.J.M.C.'s wishes and interest are directed towards tackling the fundamental factors of the technical problem in their Mills.

Scant organization at all levels and inexact assigning of responsibilities between the Corporation and the Mills would however prevent the full achievement of good results, if appropriate measures are not taken.

III. With other experts working on the Project

A spontaneous, unrestricted working collaboration was established with the Quality Control expert. In fact, problems relative to some of the processing phases, such as emulsion and its stability, piling and raising of jute temperature etc., were worked upon in mutual agreement.

On the other hand, it proved impossible to carry out any work in common or, in any case, in coordination with the Production Planning Expert.
We feel it would have been extremely advantageous had it been possible to make a mutual attempt to find a solution to the problem of the too frequent changeovers of type of product being processed which frequently occur in Bangladesh Jute Mills.

This is mainly due to inadequate Production Planning but directly influences the productivity of the various mills as a whole.

In fact, every changeover to another type of product leads to one or more groups of machines waiting idle with consequent production losses with respect to the hours resulting as having been worked.

The Borghi & Baldo Productivity Team repeatedly drew attention to the seriousness of this problem.
(See First Progress Report F.27.1 and
First Interim Report B.13 etc.)

Unfortunately, the coordination which should have been set up by the Project Manager to resolve this and other problems was, as already mentioned in other Reports, lacking in every respect.

D. Major Problems

I. Counterparts

During the last phase of the project problems also arose with the counterparts. The introduction into the Team of new, young and inexpert persons-which certainly did not contribute to the continuity of the work-proved to be particularly detrimental.

In fact, we would say that the counterparts proved to be one of the greatest problems encountered during the whole project, for the following reasons:-

a) Delay in assignment to the Team of all the required counterparts and, consequently, approximately 35% of the foreseen counterpart man-days were not worked.

   On this subject we furthermore draw to your attention the fact that the foreseen number of counterparts (12) was present only after B.J.M.C.'s circular letter of 15/11/78 (see Annex 3 - Second Interim Report). That is to say, 50 weeks after the date foreseen in the Terms of Reference of the Contract.

b) Continual moving around and alternation of persons, with jobs left uncovered between departure and substitution, meant that the Team had to be repeatedly rebriefed even towards the end of the project.

c) It should be kept in mind that no less than 19 different persons entered the Team at one time or another during the 25 months covered by the project and, of these, only three were able to work on the project from April 1978 to the end.

d) Many of the counterparts came up against problems relative to allowances, accommodation, uncertain prospects as regards work and careers. For instance, some counterparts, whilst in our Team, were working in mills which were not their usual places of work and their original jobs were often taken over by someone else without the counterparts being given any certain prospects for the future.

These factors obviously had a negative effect on the continuity and quality of the work, to the extent that our Team has decided to submit a report on the matter to the highest levels in the Corporation (see Annexes XXVIII and XXIX).

II. Accommodation difficulties

During the entire duration of the project; accommodation difficulties were encountered in the Khulna zone.

In fact in this zone there are no hotels and it was therefore difficult to find free rooms.

More than once trips to Khulna, arranged well in advance, had to be postponed due to lack of accommodation.

This situation did not arise in the Chittagong area.

III. Secretarial services

For the whole duration of the project the Team never had their own, independent, secretariat.

It is our opinion that the lack of supply of such services is a consequence of the Contract, which specified only 'administrative support facilities' (see Terms of Reference - para. 8).

This fact obviously created lengthy delays and many difficulties - especially concerning the catalogueing and filing of correspondence and of all the documents which, as time went on, were collected or elaborated.

To overcome, partially, this problem the Team assumed, at their expense, a local secretary.

The Team even resorted, at their own cost, to paying over-time for this work to the Project Manager's Secretary.

IV. Transport

For the whole period of the project the Team had at their disposal two cars and one or two drivers.

The availability of only one driver from August 1979 onwards limited, to a certain extent, the movements of the 2 members of the Team since Bangladesh isn't a country where one can travel alone especially for long distances outside the city.

4. CONCLUSIONS AND RECOMMENDATIONS

Although we feel that this report has plainly expressed our points of view regarding the problems encountered in the Bangladesh Jute Industry, we should like, at this point, to sum up our ideas on the situation.

A. Staff Policy

I. General policy

Attention has already been drawn to the fact that, in Bangladesh, the average qualification of workers is fairly low, whereas absenteeism and staff turnover are very high.

It is also to be noted that the higher salaries offered by privately owned industries, and in even greater measures by wealthier countries, greatly attract Bangladesh managers and technicians.

A certain part of the qualified staff turn-over, even at high levels, is to be put down to personnel who leave the Corporation, and even the country, in search of higher salaries.

On the other hand, Bangladesh is over populated and lacking in raw material resources and therefore will be obliged to utilize the emigration of workers to their best advantage, i.e. in terms of export of qualified personnel.

It is also evident that posts and higher salaries will be offered with even increasing predominancy to those workers who can boast high qualifications.

An obvious consequence of the above is the necessity and the profitability, both for the B.J.M.C. and for the country itself, to develop a general policy to be applied for the workers in this sector.

This policy should cover several different aspects of the question such as: salary levels, career planning, employment, training, duties and responsibilities, circulation of information, etc..

This briefly means:-

a) Salary Level

A salary policy which, whilst being coherent with the general possibilities of the country, would motivate and incentivate interest and the achievement of professional qualifications at all levels.

b) Career planning

General planning of careers which would bring about, in time, more valid and capable personnel to occupy the jobs offering responsibility.

c) Employment

Define the present and future staff requirements, for the various sectors (production, maintenance, services, etc.) in accordance with technical and managerial progress, production programmes, turn over etc..

d) <u>Training</u>

There must also exist a systematic and well planned training programme covering both present and future requirements for all posts.

e) <u>Duties and responsibilities</u>

We feel that care should always be taken to assign duties and responsibilities properly and correctly.

This necessarily implies the existence and the functionality of valid organization charts for all levels both in the Mills and inside the Corporation.

f) <u>Circulation of information</u>

A management information system should simultaneously be created for the Mills and the Corporation. This system should be in accordance with the principles of "Management by Objectives".

This will mainly define what information is to reach certain management levels so as to :-

- prevent the top management level being flooded with too much information;
- supply the management with the information necessary to enable them to make the right decisions at the right time.

May we just mention that, in our opinion although the putting into practice of a suitable personnel policy would produce, through its application, a transitory cash flow absorption, the returns in productivity increments would very soon make themselves felt.

II. Counterparts

We trust that all deserving counterparts who took part in the Borghi & Baldo Productivity Team's activities will be offered:-

a) tangible recognition for the interest shown in this type of work;

b) the possibility of responsibly continuing and following up the analyses and suggestions made, either in the Mills in which they were originally employed or, in any case, in other Corporation Mills.

B. Processing and Production Planning

We emphasize, once again, the importance of proper processing and production planning for the achievement of increased productivity.

In fact, it should be kept in mind that:-

- the incidence of raw material on the final production cost is still 60% so cheaper raw materials should be used as extensively as possible;
- there are approximately 23,000 looms working and the different types of finished products are about 100 so production programmes should avoid product change overs during processing.

The main action to be taken in these two fields can be summarized as follows:-

a) definition of processing standards to be used in all Mills, particular attention being paid to attainment and following of same;

b) definition and checking of the standard characteristics of the ingredients such as emulsifiable oil, emulsifiers etc.;

c) rationalization of the technological cycle in all Mills as regards:-

   - cut and uncut jute;
   - emulsion application;
   - piling

   on the basis of the proposals made by the Borghi & Baldo Productivity Team.

d) rationalisation of machinery (see softeners, spreaders, breaker cards) and plant (see rapisonic plant) utilization, in compliance with the characteristics indicated by the makers.

e) setting up of suitable production planning in order to reduce product changeovers to a minimum;

f) improvement of machinery utilization, especially during day shifts.

Detailed proposals and remarks, especially on the first four points, were advanced by the Productivity Team, as reported in the previous chapters.

C. Maintenance

It is important that the machinery be properly utilized and kept in good condition. This is very seldom the case in Bangladesh.

International organizations have given, and continue to give, assistance particularly as far as maintenance is concerned.

In our opinion, the following points are of great importance:-

- clear definition of objectives;
- maximum co-ordination of the various action taken.

The Borghi & Baldo Productivity Team was asked to express their opinion on this most important matter and have done so in a short report (see Annex XXX).

D. Costing

In the present day industrial world, no concern can be properly run unless it applies adequate costing methods.

An efficient costing system :

- helps to enable the Technical Management to make the most apt decisions;
- aids the Commercial Management in the development of its Sales Policy.

The costing system should therefore enable costs to be estimated for each production phase, for each production line and for each type of product.

We would not say that the costing system applied in Bangladesh achieves these purposes because too many and too great approximations are made.

We would greatly recommend that a study be made to develop an efficient costing system which, without being too elaborate, will all the same be adequate to meet the needs.

UNITED NATIONS INDUSTRIAL DEVELOPMENT ORGANIZATION

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JUTE INDUSTRY DEVELOPMENT PRODUCTIVITY IMPROVEMENT IN BANGLADESH

(UNIDO CONTRACT N° 77/105 - PROJECT N° DP/BGD/73/043)

FINAL REPORT

VOLUME II; ANNEXES I–IV

MILAN, JUNE 1980

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UNITED NATIONS INDUSTRIAL DEVELOPMENT ORGANIZATION

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ANNEX I

ANNEX I

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s.p.a.

To:

Dr. Ihab A.H. Ascar
UNIDO Porject Manager
Project BGD/73/043
Jute Industry Development
BJMC, Dacca

16/8/1979

Subject: Report on Softeners/Spreaders and Emulsion Application

Dear Sir,

Only to enclose our Team Report on the above subject, with enclosed the tests run in the 4 Pilot Mills, with our comments and proposals.

Yours faithfully,

L. GALLETTI
Productivity Team Leader a.i.

c.c. Mr. S.Y. Bakht, Director (PP)
Mr. Aminul Haque, General Manager (PP)
Mr. B. Kocern UNDP
File

borghi e baldo ingg.
s.p.a.

July 6, 1979

REPORT ON SOFTENING PROCESS AND EMULSION APPLICATION

The processing of jute fibre has already been lined up since many years. It is obvious that it should be well known by all the people involved in the working process of the same fibre - that naturally is the case of Bangladesh, a country where jute assumes an exceptional importance.

However we think useful to reassume some fundamental ideas: the main one, which lies as basis of all the jute processing, consists to part the natural fibre in the innumerable single fibres of which the same is composed, to parallelize those fibres and to reduce and lengthen their initial section.
After this, given a certain twist, it is possible to obtain yarn of a desired count.

It is obvious that the output on quantity and quality of the complete process is higher as more correct is the putting into practice of the above concepts.

We have to remember that jute is a wooden cellulosic fibre with many hard portions: it is delivered to the mills with its single fibres still packed together by organic and rubbery stuff. This stuff should be eliminated to allow the single fibres to separate and to slide between them, while the hard portion of the fibre should become the most possibly elastic and flexible.

The above explanations show the ultimate purpose of the softening process, of the emulsion application and, last but not least, of the piling operation.

A - SOFTENER

- The fibre is passing through a row of heavy rollers of cast iron, which are pressed between them by strong springs. In this way, due to the mechanical work of the rolls weight and of the compressing springs, the fibre is softened, i.e. it becomes as much as possible elastic and flexible, especially in the hardest portion.
- During the softening process, at about 1/3 of the machine length from the feeding side, to the fibre is applied emulsion (we have already stressed characteristics and importance of the same in our previous report on this subject).
- We would like to recall that the softener suitable for low degree of jute quality is a hand fed machine, therefore, particularly liable to faults and lack of running uniformity.
  That means that this type of machine should be carefully checked out if we want a good processing with complete achievement of the main purpose.

On the following we intend to go over the main points for a correct softening process:

1) Feeding: It should be the most uniform and constant possible. We recall the need that the workers feeding the machine should get the morrahs selected as much as possible inside definite weight limits (see our previous Report on the subject). The feeders should work with a uniform rhythm, trying to cover the feeding cloth almost totally, without gaps between morrahs and without overlapping.
   Very often we noticed in fact that the feeding is done only in the central zone, with negative consequences that we will point out later on, on this same Report.

2) Speed of the Machine: It should be as much as possible proportional to the feeding speed of the workers in charge of the machine.
As an example if we suppose that two workers are able to feed an average of 10 morrahs by minute and that a single morrah will reach an average length of 1.67 yds., then the optimal speed of the feeding cloth should be about 17-18 yds. per minute.
The delivery speed of the machine should be higher, in connection to the feeding speed, by about 10%.
Referring to the above example therefore the delivery speed should be of about 19-20 yds. per minute.

3) Emulsion Application: It should be applied in a way to soak in a uniform manner all the fibre passing through the machine, reducing meanwhile to a minimum the emulsion losses.

It should be kept clearly in mind, for not deceiving anybody, about the quantity and the quality of the emulsion recovery, that the same could be only partial and it is formed by a product polluted by dust, wooden remainings of the fibre, etc.

The emulsion flux should be proportional to the jute flux passing through the machine.

We point out that the purpose of the emulsion application is to supply to the fibre the correct percentage of oil, according to the different quality of the fibre itself.
Generally speaking, the correct percentages of oil are the following:

. for soft jute : 4 - 5 %
. for Mestha : 6 - 7 %
. for hard jute and cuttings: 8 - 9 %

- The softeners should be provided with stop motion equipment to the emulsion flow, in case of complete stoppage of the machine
- It is also advisable never to run the machines idle, with an open emulsion flux - the loss of emulsion will be total.
- Referring to the example at Paragraph 2), supposing an average weight of morrahs about 2.25 lbs. each, the feeding will be:

  10 morrahs/60" x 2.25 lbs. = 22.5 lbs/minute.

  Supposing an emulsion with a content of 20% of oil and a desired application on fibre of 5% of oil, then the emulsion application should be:

  $$0{,}20 \times X = 0{,}05$$

  From which we deduce X = 25%.

  If we allow an emulsion loss through the machine of about 10%, then the needed total emulsion flux will be:

  $$Y = 22.5 \times 0{,}25 \times 1.1 = 6.19 \text{ lbs/minute.}$$

- In case of an emulsion made by a RAPISONIC plant and sprayed by a Fraser Metering Unit, we should remember that emulsion made by such plants is formed by 50% oil and 50% water. Then the 2 metering unit valves should be adjusted in such a way to obtain:

  Emulsion flux = 40% of the total

  so:

  $$\frac{40}{100} \times 6.2 = 2.48 \text{ lbs/60"}$$

  Water flux = 60% of the total

  so:

  $$\frac{60}{100} \times 6.2 = 3.72 \text{ lbs/60"}$$

To control if the above calculation is correct, we will follow the opposite way:

2.48 lbs. contain 1.24 lbs. of oil (50%)

if we deduct a 10% of losses, we will have:

$$1.24 - 10\% = 1.12 \text{ lbs.} = \frac{1.12}{22.5 \text{ lbs}/60''} = 5\% \text{ oil.}$$

4) Mechanical Conditions

Softeners are very simple and heavy machines, which are able to run without much care: just for this reason, the mechanical faults are often omitted.
Above all care should be taken so that:

- the springs should be all equal and uniformally adjusted
- the rollers should not be worn out beyond a certain limit and mostly they should not be oval, due to feeding faults.

B - SPREADER

This type of machine has been brought up in the Fifties and has in great measure replaced the older softeners.

The spreader is following a different technological idea: instead of the mechanical work of weights and springs, to the fibre will be given a first coarse action of carding and drawing.
By this we will reach a first cleaning of the fibre from wooden remains and an initial opening of the primary fibres, with beginning of the process of parallelising and reduction in section of the same fibres.
All this will be reached by passing the raw fibre between 2 chains, a slow one and a fast one, provided with bars and coarse pins.

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s.p.a.

From the processing point of view, we think the spreader suitable for jute of a medium/high degree of quality.
This machine, really, shows the following advantages in comparison to the old softeners:

- reduction in manual faults on feeding, during the following process steps (see carding process)
- better application of emulsion, with less wastages
- better piling, because it will be formed by compact rolls, obtaining in the meantime the result of a cut in the space needed for the operation, space often lacking in the mills lay-out
- more productivity.

As a consequence, if the machine is running in a correct way, it is possible to obtain notable improvements in the regularity of all the following process and therefore, in productivity itself.

Spreader, in spite of being a heavy machine, needs a very careful maintenance: specially for chains, pin bars and roll formers.
For this reason all those parts should be checked regularly and overhauled in proper time. Normally spare parts for spreaders are quite expensive: this can explain, but only in part, the trend, which we noticed in the mills, to neglect the maintenance.
Simple technical-economical considerations can easily show that the money involved in the purchase of spare parts for spreaders will be quickly amortized by the higher production of the machine itself and by the drop of wastages.

TEAM ADVICE

1) The workers assigned to softener feeding should be trained for long period to a feeding rythm the more uniform as possible.

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2) The feeding speed of softeners should be proportional, as far as possible, to the average total length of the fibre which is going through the machine.
In this way gaps will be reduced to the very least.
As it shows clearly in the annexes (1 to 4), a double feeder is essential, on all the mills.

It is worthwhile to remember that reducing gaps on the feeding cloth is one of the main factors to decrease emulsion wastages in the softening process.

3) The delivery speed should be higher in comparison to the feeding speed of about 10-15%.
In this way jumps will be reduced to a minimum with consequent improvement of the efficiency of the machine.

4) The percentage of oil, which should be applied to the fibre, should be predetermined. From this datum the percentage of oil in emulsion will be worked out, and consequently the flow of emulsion.

5) Flow Chart of emulsion, or emulsion and water, coming from the distribution valves, should be recorded in every mill for each machine: the flow should be checked to control the constancy and continuity of the same with time.
We will point out in this connection the need of accurate cleaning on the application plant (see Annexe 5).

6) Once the distribution valves will be calibrated on the grounds of requirement, from time to time it should be checked if the quantity of emulsion applied is in conformity with the desired quantity.
Only slight adjustments on the valves calibration will be then necessary to obtain the desired amount.

7) It should be remembered that the final purpose of emulsion application is to apply oil on fibre in the most uniform way and in the required quantity.
Some application systems checked on some mills are absolutely wrong and not economic (see Annexe 8).

REMARKS ON ANNEXES

Annexe 1:

Dacca Jute Mill

Softeners No. 1 and No. 2 are showing too high speed, both for feeding and delivery side.

A) On feeding side, with a single feeder and with an average feeding ratio of 6.70 morrahs/minute, we will have:

Morrahs 6.70 x 1.70 yds. (average length of fibre) = yards 11.4/minute against an actual feeding speed of machine of 25.5 yds. on softener No.1 and 23.5 yds. on softener No. 2.

ESSENTIAL ACTION IS TO RESORT TO A SECOND FEEDER - In this way the average feeding ratio will rise to 12 morrahs/minute - then -

Morrahs 12 x 1.70 yds. = Yards 20.4/minute

Second step will be of reducing the speed of softener No. 1 at least to the same speed of No. 2, i.e. to 23.5 yards per minute.

B) On delivery side, taking a lead from 10 to 12%, the speed should be consequently reduced to about 23 yards/minute.

Annexe 2:

Chittagong Jute Mill

On this mill, double feeding on softening is already normal way of processing.

If we assume the figure of 15 morrahs on the average feeding ratio, then the feeding speed of the machine is correct (15 morrahs x 1.70 yds. = 25.5 yds/minute).

Instead the delivery speed should be slightly decreased, to about 31 yds/minute

Annexe 3

Platinum Jubilee Jute Mill

A) On feeding side, with a single feeder and with an average ratio of feeding of 8 morrahs/minute, we will have:

Morrahs 8 x 1.70 yds. = yds. 13.60/minute against the actual speed of about 18 yds.

ESSENTIAL ADVICE IS TO RESORT TO A SECOND FEEDER, with an increased feeding ratio of 12/13 morrahs/minute.

Then: Morrahs 13 x 1.70 = 22 yds/minute.

Second step will be of increasing afterwards the speed of softener to about 24 yds/minute.

B) On delivery side, the speed should be increased accordingly to about 28 yds/minute.

Annexe 4

Bangladesh Jute Mill

A) On feeding side, with a single feeder and with an average ratio of feeding of 5.8 morrahs/minute, we will have:

Morrahs 5.8 x 1.70 yds. = Yds. 9.90/minute against the actual speed of the machine of about 18 yds.

ESSENTIAL ADVICE IS TO RESORT TO A SECOND FEEDER: Then morrahs:

Morrahs 13 x 1.70 = 22 yds/minute.

The machine speed will be increased accordingly to about 24 yds/minute.

B) On delivery side, the speed should be increased afterwards to about 28 yds/minute.
The actual ratio between feeding and delivery side is too low, with high possibility of jams.

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ANNEX 1

SOFTENERS - DACCA JUTE MILL.

No. of Machine	SPEED (Yds/Minute)			FEEDING			Yards on feeding / Morrahs fed	Type of Jute Batch
	Feeding	Delivery	Ratio Delivery/Feeding	No. Feeders	No. Morrahs/Minute Short Time	No. Morrahs/Minute Long Time		
1	25.5	35.6	1.40	1	9	6.60	2.83	BWC cut
2	23.5	35.6	1.51	1	10	6.30	2.35	BWC Bottom
3	30.2	35.1	1.16	1	-	-	-	Cuttings

ANNEX 2

SOFTENERS - CHITTAGONG JUTE MFG. COMPANY, LTD.

No. of Machine	SPEED (Yds/Minute) Feeding	Delivery	Ratio $\frac{\text{Delivery}}{\text{Feeding}}$	No. Feeders	No. Morrahs/Minute Short Time	Long Time	Yards on feed Morrahs fed	Type of Jute Batch
1 to 5	27.33	33.67	1.232	2	15.3	12.22	2.24	(Mill No. 1)
1	27.00	33.20	1.23	2				(Mill No. 2)
2	27.55	33.90	1.23	2				(Mill No. 2)

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ANNEX 3

SOFTENERS - PLATINUM JUTE MILL

No. of Machine	SPEED (Yards/Minute) Feeding	Delivery	Ratio Delivery/Feeding	No. Feeders	No. Morrahs/minute Short Time	Long Time	Yards on Feeding / Morrahs fed	Type of jute Batch.
2	18.32	19.69	1.075	1	10.9	7.68	2.39	White X Bottom
3	18.32	19.69	1.075	1	10.5	7.78	2.35	Mestha
4	18.53	18.77	1.013	1	10.35	8.73	2.13	Tossa X Bottom
5	18.32	19.22	1.049	1	10.6	8.95	2.05	Tossa X Bottom

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ANNEX 4

SOFTENERS - BANGLADESH JUTE MILL.

No. of Machine	Speed (Yds/minute) Feeding	Delivery	Ratio Delivery/Feeding	No. Feeders	Feeding No. Morrahs/minute Short time	Long time	Yards on feed Morrahs fed	Type of jute Batch.
2	18.34	18.56	1.01	1	8.3	5.8	3.16	Uncut Jute.

ANNEX 5

VARIATIONS ON FLOW TAKEN FROM
SOFTENER No. 5 AT PLATINUM JUTE
MILLS.

	Checking on 11/6	Checking on 19/6	Variations	Remarks
Emulsion	184.8	200.4	+ 8%	The checking on 11/6 was made before cleaning of application plant.
Water	136.8	160.2	+ 17%	
Total	321.6	360.6	+ 12%	The checking on 19/6 was made after cleaning of application plant.

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ANNEX 6

CHITTAGONG XXX JUTE MILL

We take in consideration Softener No. 1 of Mill No. 2 -

2 Feeders = 12 morrahs/minute (average) x xx lbs. 2.25 (average morrah weight) = 27 lbs/minute x 60
= 1620 lbs/hour.

Emulsion application = 25%

Then, emulsion applied on 1620 lbs./hour = 405 lbs/hour.

Valves setting =

Emulsion	60 ------ 4.14	lbs/minute	= 248.40	lbs/hour
Water	90 ------ 9.05	lbs/minute	= 543.00	lbs/hour
	Flow	Total	791.40	lbs/hour

With $\frac{0,5 \text{ (Rapisonic plant) } x\ 248.40}{791.40}$ = 16% oil in emulsion

Oil in fibre = 0,16 x 0, 25 = 3.92

This percentage is too low, it should be 5% = having a 16% oil in emulsion, then the application should be:

$$\frac{5}{16} = 31\%$$

This application could be reached or increasing the covering of feeding cloth or increasing the emulsion flow -

Wastage calculation :

Long jute 1 Ton (2240 lbs) Emulsion lbs 1094 ------ $\left(\frac{\text{lbs } 2240}{\text{lbs } 1620} \text{ x } 791 \text{ lbs}\right)$

(Application 25%)
Emulsion applied 560 lbs +
Jute 2240 lbs
2800 lbs.

534 lbs wastage
(1094 - 560)

I/16

694 Fresh emulsion (560 + 134) 400

Emulsion applied 560 534

Input = 694 + (63%)
400 (37%)
1094

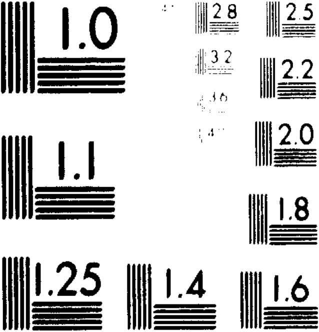
Output = 560 + (Emulsion fresh applied
400 + (Recovered emulsion
134 + (Wasted emulsion
1094

-------0------ Recovered emulsion
(75%)

-------0--------------- 134 final wastage (25%)

-- 51%)
-- 37%)
-- 12%)

81.11.30



MICROCOPY RESOLUTION TEST CHART

ANNEX 7

PLATINUM JUTE MILLS

We take in consideration Softener No. 5

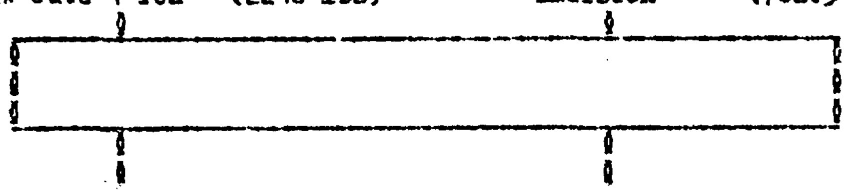
1 Feeder = 7 morrahs/hour = Morrahs 7 x 60 x 2.25 lbs = 945 lbs/hour.

$\frac{\text{1 Ton jute (lbs 2240)}}{\text{lbs 945}}$ = 2.37 hours/Ton.

In 2.37 hours the flow would be = 2.37 x lbs 321.60 (flow/hour) = 762.31 lbs.

Balance :

Raw Jute 1 Ton (2240 lbs) Emulsion (762.31 lbs)

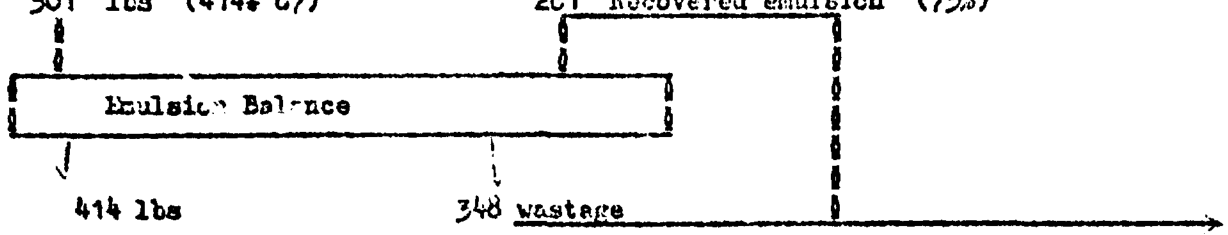


(Application 18.5%)

Emulsion	414.4 +
Jute	2240.0
	2654.4

348 lbs wastage
(762-414)

Fresh emulsion 501 lbs (414+ 87) 261 Recovered emulsion (75%)

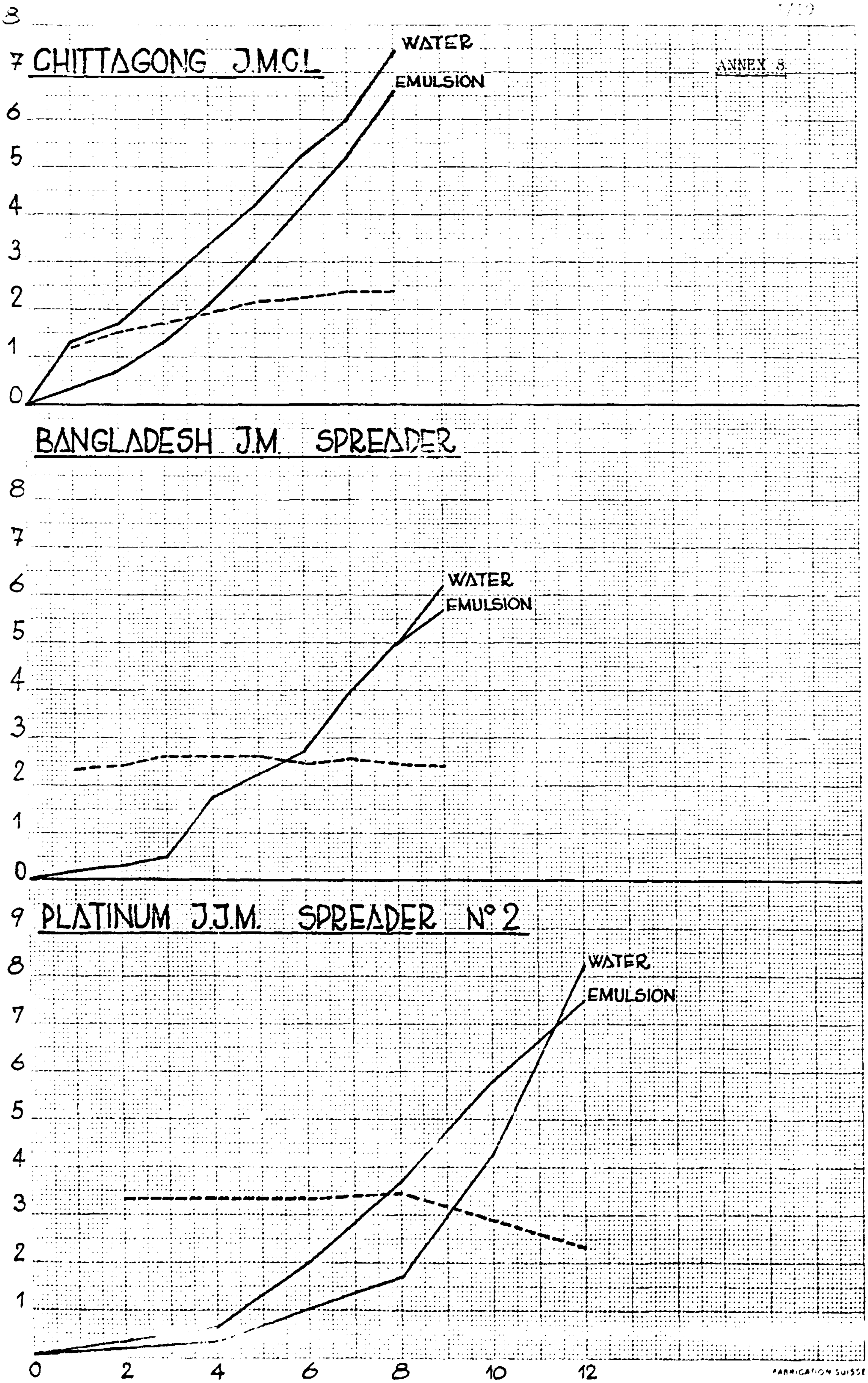


Emulsion applied 414 lbs 348 wastage 87 final wastage (25%)

Input = 501 (66%)
261 (34%)
762

Output = 414.0 + (54%) emulsion applied
261 (34%) Recovered emulsion
87 (12%) Wasted emulsion
762.00

ANNEX 8



FABRICATION SUISSE

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ANNEX 9

PLATINUM JUTE MILLS

2. SOFTENER MACHINE (MILL NO. 2)

This Mill has 5 Softener machines. Out of 5 machines 4 are for long jute and one is for short fibre.
The general overall conditions of said Mills is very poor. The general mechanical conditions of the machine are as follows:

a) Position of Feed Rollers: very bad. Diam at the centre of roller has been reduced by 1/4" to 3/8".

b) Condition of Spherial Rollers: very bad. Flute edges become sharp. Shafts on both sides worn out reducing the diam by 1/8" to 3.1/4" and in some cases, it is more. At least 35% of Roller need immediate replacement. Diam at the middle of Spherial Roller worn out.

c) Bushes: badly worn out, at least 60% bushes need immediate replacement.

d) Bearing condition: reasonable - Few need immediate replacement.

e) Bevel and Gear condition: not good. At least 5% bevel and gear need replacement due to age and breakage of teeth.

f) Main drives, shaft & key condition: Reasonable. 5% keys need immediate replacement.

g) Condition of gear box: reasonable.

h) Sprocket Chain, Sprocket Gear: not good. Need replacement.

i) (i) Cleaning and Lubrication Position: oil passing holes of bushes have been closed down. Need cleaning and oiling.
(ii) Metering Unit: Not working properly. Auto stop switches are not working. Valves are leaking.
(iii) Overflow of emulsion was also found.

In Softener Machine No. 2

Out of 64 pairs of spiral fluted roller bushes, 10 number of roller bushes had 1/8" Draft, another 7 number 1/4" to 5/16" Draft which require to be replaced immediately. Other side also the same but tension of the spindles are found 8 number low tension and 14 number high tension and tests are found all correct. These improper tensic can be removed only if breeze and gable worn out can be repaired properly. Position of emulsion application is the same as in Machine No. 1 - gabel pinion also found damaged.

Machine No. 3

This is a cutting Softener with Hopper Feed. The condition of this machine are bad in comparison with other two machines. There are two trays for emulsion application, just beside this tray 16 + 16 = 32, i.e. 32 numbers of roller bushes found 1/8" to 1/₀" drift and one roller gabel found completely damaged and bush also two. Out of 64 realise rod tension checked only 24 correct, rest 32 low tension and 8 (eight) high tension.

M. Saleh

Counterpart of Productivity Team,
U.N.I.D.O.

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s.p.a.

PLATINUM JUBILEE JUTE MILLS LIMITED

TOWN KHALISHPUR: KHULNA

SPREADER MACHINE

This Mill has 4 (four) Spreader Machines. Out of four three are running at present. But their mechanical condition is very bad. Almost all parts have been very worn out.

However, following position has been observed in Spreader Machines:

1) Position of Feed Roller: very bad. Diameter reduced more at the middle of the roller. All shutes have been worn out.

2) Dollop Weight Scale: the condition of Dollop Weight Scale is good and giving correct reading.

3) Condition of Slow Section:

   a) Truck condition: completely worn out

   b) Hackel bar, pins, spacing washer, stud, heel runner, etc. of slow side have been completely worn out. Hackle bars are running in an angular direction, which should be run at 90°. Angle for better penetration of bars. This is due to all parts being worn out.

4) Fast Section Condition:

   a) Hackle bar, pins, trucks, studs, etc. have been completely worn out and need immediate replacement. The condition of hackle pins is very poor due to age. Penetration of hackle pins in Jute fibre is same as slow section.

5) Delivery Roller: Badly worn out. Needs replacement.

6) Bearing, Chains, etc.: general condition is very poor. Triplex Chain needs replacement.

7) Pressure Gauge. Oil Pumps: Pressure gauges & Oil pumps are not working therefore automatic lubrication is not possible. Care should be given for better lubrication of machinery, for better, smooth and long life of machines.

8) Gear Side Position: Many gears need immediate replacement as teeth have been either worn out or badly damaged. Same condition for some of Shafts & Studs of said machine.

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s.p.a.

Dated: 15.5.1979

THE DACCA JUTE MILLS LTD.
HASNABAD, DACCA
MILL NO. 1

The General Condition of Softener Machine

1) The pressure tension arrangement on the softener machine is not 100% correct and no doubt this factor has influenced the heavy wear which has taken place in top and bottom roller bushes.

Due to incorrect tension, the bushes have been allowed to "draft" at abnormal degrees and the roller is also worn out moreover some of the spiral fluted roller are also affected.

2) Emulsion Application:

Spray jet arrangement are virually non-existent and I am at a loss to understand how efficient regular control of emulsion application has been possible in their absence. Now they are using tray system but there is no meter, on such type of control valve which can be certain of the correct application of the emulsion. Speedy attention should be paid to spray Batching arrangement in order that emulsion application may be held at levels in accordance with the material being processed.

In Softener Machine NO. 1

Out of 64 pairs of rollers in one side 8 (eight) number of roller bushes had 1/8" to 3/16" "Draft" and another 8 (eight) number of bushes had 1/4" to 5/16" Drafts which require replacing immediately. Other side also the same.

Tension of the realise rod, i.e. spindles, in some of the rollers cannot be maintained as gable of said machine is worn out: this requires to be repaired properly.

In machine No. 1, 9 (nine) number of Breeze, fixed up to the top of the spindles, were also found to be worn out. The breeze also required to be replaced for proper tension.

ANNEX 10/1

THE DACCA JUTE MILLS LIMITED:
HASHIMABAD: DACCA:

Dated: 15.5.73

SOFTNERS MACHINE

Spring tension of softener machines were checked and the results given below.

Mill No.	M/C No.	Pair's of Roller	Low Tension Spg. Nos.	High Tension Spg. Nos.	Correct Tension	Rollers necessary to replace: TOP L/H.	TOP R/H.	BOTTOM L/H.	BOTTOM R/H.	F/D Straight fluted.	
1	1	64	16	6	42	-	-	-	-	-	-
-do-	2	64	7	14	43	-	1 One Pc. of roller to be replaced				
-do-	3	64	32	8	24	-	-	-	-	-	-
-do-	1	64	Bushes to be change or replaced: 16 Pairs of bushes.								
-do-	2	64	-do- 18 -do-								
-do-	3	64	-do- 24 -do-								

Gable requires to be repaired for correct tensioning numbers of group of the Gables requires to repair immediately.

-do-	1	7	numbers of group of the Gables requires to repair immediately.
-do-	2	12	-do-
-do-	3	20	-do-

N.B. In Mill No.1 ~~mill~~ all the Softener machines are running without metering unit. Machine Nos. 1 to 3 these are connected with extra Pipe line which is manually operated (ordinary system of ~~bal~~ valve.) So the emulsion application cannot be control within this system of manual control valve.

~~Yours faithfully~~

(MD. SALEH)
COUNTERPART UNIDO PRODUCTIVITY TEAM

CHITTAGONG JUTE MANUFACTURING CO.LTD.

Dt: 7/5/7

SOFTENER MACHINE.

Spring tension of softener machines were checked and the results are given below alongwith necessary requirements of Rollers to be replaced :-

Mill No.	M/C. No.	Pair's of Roller.	Low tension Spg. Nos.	High tension Spg. Nos.	Correct Tension.	Rollers necessary to replace. TOP L/H.	TOP R/H.	BOTTOM L/H.	BOTTOM R/H.	F/D. Straight fluted.	
1	1	64	14	12	58	-	-	-	-	-	-
1	2	64	15	8	41	3	8	3	4	-	-
1	3	64	13	6	43	4	4	3	4	2	2
1	4	64	16	13	35	5	4	6	6	2	2
1	5	64	17	4	43	4	5	7	5	2	2
1	6	40	12	8	20	7	5	9	7	2	2
1	7	64	8	9	47	6	6	8	8	2	2
2	1	64	13	8	43	6	6	4	3	-	-
2	2	64	10	5	49	5	5	4	5	-	-
C.B.D.	1	64	13	6	45	3	2	4	3	-	-
C.B.D.	2	64	12	7	45	3	4	2	3	-	-

N.B. - Mill No.2 and C.B.D. softener machine, metering units are in working order but No.1 Mill all the machines have metering units without any use of the same, as those are out of order. Now all these machines were connected with extra Pipe Line for application of Emulsion in Mill No.1 with ordinary Valve system.

Seen
12/5/79

CHITTAGONG JUTE MANUFACTURING CO.,LTD.

General Mechanical condition of Softener machines in Mill No.1 & 2.

	1	2	3	4	5
Feed/ arrangement position.	Normal but F/Cloth is made out of jute fabric	Normal F/Cloth made out of Jute Fabric.	Normal F/Cloth made out of J/ fabric.	Normal F/Cloth made out of J/fabric.	Normal F/Cloth made out of Jute fabric.
Roller's condition.	Good (new set of Rollers)	10 % Worn-out.	15 % Worn out.	20 % Worn out.	20 % worn out.
Bearing & Bushes condition.	10% worn out	30% worn out.	25% worn out.	35% worn out	30% worn out.
Bevel & gearing condition.	Normal.	15% worn out.	15% worn out.	10% worn out.	15% worn out.
Gear box, sprocket & chain conditions.	Normal.	Normal.	Normal.	Normal	Normal.
Main drive & shaft condition.	Normal.	Normal.	Normal.	Normal.	Normal.
Delivery condition.	Normal D/ Cloth made out of J/fabric.	Normal D/cloth made out of Jute fabric.	Normal D/Cloth made out of J/fabric.	Normal D/Cloth made out of J/fabric.	Normal D/Cloth made out of J/fabric.
Tension of spring & Pressure.	10% bad	30% bad.	25% bad	20% bad	25% bad
Lubrication.	Normal.	Irregular.	Irregular.	Irregular.	Irregular.
General cleaning.	No good.	No good.	No good.	No good.	No good.

14/12/[illegible]

	6	7	8	9
Feed arrangement position	Normal F/Cloth made of J/fabric.	Normal F/Cloth made out of jute fabric.	Normal F/Cloth made out of jute fabric.	Normal F/Cloth made out of jute fabric.
Roller's condition	40 % worn out.	25% worn out.	15% worn out.	15 % worn out.
Bearing & Bushes condition	45% worn out.	30% worn out.	25% worn out.	25% worn out.
Bevel & gearing condition	20% worn out.	25% worn out.	15% worn out.	20% worn out.
Gear box, sprocket & chain condition	Normal.	Normal.	Normal.	Normal.
Main drive & shaft condition	Normal.	Normal.	Normal.	Normal.
Delivery condition	Normal D/Cloth made out of j/fabric.	Normal D/Cloth made out of J/fabric.	Normal D/Cloth made out of jute fabric.	Normal D/Cloth made oft of jute fabric.
Tension of spring & pressure	15%	25% bad	15% bad	15% bad
Lu ication	Irregular.	Irregular.	Irregular.	Irregular.
General cleaning	no good.	no good.	no good.	no good.

ANNEX II

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Consulenze e progettazioni industriali
via Amedei 15 - 20123 Milano

Capitale sociale L. 560.000.000
Sede legale: corso Italia 8 - Milano

To
Mr. Ashraf Ali
Deputy General Manager
Bangladesh Jute Mills
Ghorashal - Dacca

Distribution:

1) Mr.A.R.Talukder,Director (Tech)
2) Mr. Aminul Haque, G.M. (PP)
3) G.H. Dacca Zone I
4) Counterpart
5) File

22.6.1979

Subject: Our Report on Bangladesh Jute Mills

Dear Sirs,

In the last weeks I have visited the Bangladesh Jute Mills two times. Unluckily I could not meet you, since you were not there.

Therefore, I am sending you our report on the Bangladesh Jute Mill.

In this report you will find some specific proposals.

I hope that you will read carefully this report and give due consideration to what we suggest or propose.

It must be clear that -

- you and your collaborators will implement our proposals, if you accept them; and our counterparts are ready to help you.
- if not, will you be so kind to let us know, in writing, the reasons of refusal.

In any case, we expect a written answer from you.

If we don't get it, we will presume that the Bangladesh Jute Mill is not interested at all in getting any practical advice from the Productivity Team.

I am looking forward to hearing from you,

Yours sincerely

Dr. R. Mazzal
Productivity Team Leader

c.c. Dr. Ihab A. H. Ascar, UNIDO Project Manager
Mr. S.T. Bakht, Director (PP), BJMC.

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REPORT

1) MORRAH WEIGHT

The last tests were done by the Q.C. Department on 9.6.1979. They have taken 5 tests from each of 5 different assorters; in total 25 tests.

All the tests show that :

- the 100% of the Morrah weight is in the light side and not according to the fixed standard;
- the average weight of the Morrah comes to 2.42 lbs.

But it is well known that the average weight fixed for the Bangladesh Jute Mill is 3-3.5 lbs. instead of 2-2.5 lbs. which is the normal one.

We do not need to mention here that the Std. 3 lbs. to 3.5 lbs. was fixed and imposed because of the bad conditions of the softeners. Please refer to our letter dated 17.4.1979, hereafter included, in order to re-affirm what we have said there. (Annex I).

We want to re-affirm once again that the Std. 3 - 3.5 of the Morrah must not remain in the papers, but become a reality,even as a temporary device.

A/2 PRODUCTIVITY TEAM PROPOSALS

The Productivity Team has given a general report on the MORRAH WEIGHT since 20.4.1979.

This report, in which there are specific proposals of ours, has been sent to all the concerned boards of BJMC.

So far, no observations or criticism on the report and on the proposals there made has reached us. Therefore, we presume that this report has been accepted and that in due time will be circulated to all Mills.

Hereafter we include a part of this report (page 4-5), where you will find our proposals. (Annex 2).

We think that a systematic and continuous training to the workers be of utmost importance for the Bangladesh Jute Mills. Only through this practical step the old hand habit can be changed.

B/1 EMULSION

There are two different plants for the preparation of the emulsion:

1) Rapisonic and 2) ordinary plant.

In the Rapisonic plant are being used :

- ordinary water
- original Hostapole, as emulsifier, in the percentage of 0.25%
- the check of the emulsion breakage is done by the Q.C. Deptt.
- from 2.6.1979 to 9.6.1979 the Q.C. Deptt. shows that total breakage time (up to cream) comes on an average 22 hours).

In the ordinary plant are being used :

- ordinary water and, as emulsifier
- original Hostapole, in the percentage of 0.215% and
- soft soap, 0.9%.

The last report of the Q.C. Department shows that the total breakage time up to cream comes on an average 12 hours.

According to us, the reports on the breakage times and consequently on the stability of emulsion, are completely wrong. In fact, it is checked the time of the total breakage, and not the time when the first breakage begins. But it is this time which is the sure sign of the stability of the emulsion, and it must be of 24 hours.

Consequently the real stability of the two types of emulsion is as follows :

- 2-3 hours for the Rapisonic Plant
- 1 hour for the ordinary plant.

Many tests done by our counterparts to (BJM) Bangladesh Jute Mill, confirm our evaluation.

Here is to be mentioned that such matter has been discussed thoroughly with the Deputy General Manager in the meeting held on 2.4.1979 at our premises.

- All counterparts were present
- Our letter (thereafter included) dated 14/4/1979) summed up the above mentioned conclusions (ANNEX 3).

B/2 PRODUCTIVITY TEAM PROPOSALS

So far that this matter is concerned, the Productivity Team presented a general report to the BJMC Board, since 3.5.1979.

In our report there are specific observations and proposals.

We have not got any observation from BJMC. That is why we believe that the report has been accepted and in due time will be circulated to all Mills.

In the meantime we include in this letter :

- Copy of page 10-11 of this Report (Annex 4) with our general proposals.
- Copy of Annex 13 and 14 (Annex 5/A - 5/B) of the same report, in which you will find some observations on the Rapisonic Plant mecanic conditions.

In brief we can say that also for Bangladesh Jute Mills we suggest :

- to use condensed water in both plants
- to increase the percentage of emulsifiers, which is too low, up to:
  - -- Hostapole 0.5% in the Rapisonic Plant
  - -- Hostapole 1% or soap 3 - 5% in the ordinary plant

In following these standards, the increase in the production cost will be easily compensated by yielding higher efficiency and minimizing the emulsion consumption and wastages.

C/1 EMULSION APPLICATION - SPREADER

Tests done by the Q.C. Department on 12.6.1979 show that in the Spreader Rolls the moisture content varies from 29% to 50%. Consequently the moisture regain variation comes as 40% to 100%. (These tests were done on the White-C-cut jute).

These variations are absolutely too much and depend on the irregular emulsion application on the jute. The cause of it is that the machine is provided with "Dripping system" emulsion application, which is normal for the Softeners, but <u>not for the Spreader</u>, which have the Spray Jets system. This system gives a regular application of emulsion on jute and a good piling of the Spreader Rolls.

Moreover, the delivery speed of the Spreader is twice that of the Softeners. That is why it is absolutely necessary to use Spreader with Spray Jet system.
A different system, without pressure, will result in an irregular application of emulsion, as happens in the Bangladesh Jute Mills.

C/2 DIPPING SYSTEM

The Mill is using the Dipping system for the Uncut jute. In collaboration with the Q.C. Department, we have taken tests from this, and the results are given below :

- 100 lbs. White X Bottom Jute comes to 180 lbs. after dipping but before softening. After passing through the Softener it comes to 145 lbs.

  So the emulsion wastage is 35 lbs.

We could say that the average of emulsion application on the fibre is 45% which is too much.

From the tests done it is found that the percentage of oil on the fibre after piling is as follows :

- cutting side	12.66%
- middle side	3.33%
- top side	0.45%

The oil application is completely irregular, it is too much for the cutting side, too little for the middle side, and nearly zero for the top side. Though taking into consideration the mechanic conditions of the Softeners, however, according to us, all the system is wrong. We do not only have an excess of emulsion wastage and an irregular oil application, but we think that the whole process of softening is not proper at all.

This process, in fact, consists in passing the jute under heavy and regular rollers, with pressure adjustable springs. The jute must be dry in the first third of the softener and wet in the last portion.

In the Bangladesh Jute Mill all the rollers are wet, they are all worn out, and pressure adjustable springs are not working at all.

C/3 PRODUCTIVITY TEAM PROPOSALS

Machinery

We can say that the machinery of the first part of the processing i.e. emulsion plant, spreader, softeners, should be put and kept in working conditions.

- This problem should be faced on emergency basis.
- Any technician knows how the first phases of the process affect the efficiency and regularity of the whole jute process.

We are aware that the expenses to be faced are not irrelevant. But here too it is a matter of planning according to the real possibility. On the other hand it is a matter of consideration that to delay does not help, because in the next year the expenses will be 30-40% more. This is due to the price increase, and to the deterioration of the other parts of the machinery.

The expenses made, on the other hand, will be made up by a more efficient and proper use of the machinery and by the increased production.

Dipping system

We suggest to change this system. We suggest to cut all the roots, processing the soft and hard parts of the fibre in separate way.

So all the operation will be more regular and the batch can be done by the finisher card. A scheme is found in the Annex 7.

Compare the three figures with those of the Dipping system. (Annex 6).

By adopting the system we have proposed, there will be about 560 lbs. reduction of emulsion consumption out of 1 ton processed jute, even though the mill might be able to re-utilize the most part of wastage in the existing system (Annex 8-9).

Anyway it is clear that a proper jute processing in its first phases affects all the subsequent ones and the process as a whole.

We are always ready o discuss deeper the matter with you.

D/1 PILING PROCESS

We have noticed only 8 to 10 Spreader rolls on the floor, which are very insufficient for the fermentation of the jute with the right piling time. In such conditions, the piling time can be only for a few hours.

- This time is also insufficient even for the beginning of the fermentation process.
- Considering the effects of the irregular application of emulsion (cfr. C/1) and of the piling insufficient time, one can imagine in what conditions the jute is processed in the Breaker Cards and in subsequent phases.
- Also the Spreader rolls are to be kept in pile at least for two days.

Anyway this figure must be checked according to the temperature of the jute. Only when the temperature stops increasing, then the piling process is over.

- Never process any kind of jute, which was not given a proper time of piling.
- At the Bangladesh Jute Mill the End Spreader is utilized only for making rolls from jute already emulsified and piled.
- The scheme, which is adopted also by some other Mills, is in the Annex 10.

This system brings about :

- more irregularities of the rolls (Annex 11), which are produced in two different ways; because of the unavoidable variations of the moisture content and oil application on jute.
- a higher production cost, because of the utilization of two different machines, were one would be enough, and because of the emulsion wastage, which is more in Softeners than in Spreader.

D/2 PRODUCTIVITY TEAM PROPOSAL

- Put the Spreader in efficient running conditions, so that they can work to their full capacity.
- The scheme, which is the Annex 12, may be adopted, where every type of fibre is processed according to its own characteristics.
- More regularity, more efficiency and less production cost will follow, if this system is adopted.

Needless to say, we are ready to discuss the whole matter with you.

E/1 SUPERVISION

It is our opinion that the supervision from Batching to Cards Line is qualitatively and quantitatively insufficient.

- The reports of the Q.C. Department must be given serious consideration also by the Manager, and they should lead to practical steps in correcting the production defects.

- Again we say that all the first phases of production must be carefully checked and controlled, because on them depends the whole process.

E/2 PRODUCTIVITY TEAM PROPOSAL

The Productivity Team is ready, according to its own possibility, to help out the Mill authorities in reaching the above mentioned target.

Concretely we could help the Management in :

- revising and, if necessary, correcting the Organization Chart, in order to meet the structural shortcomings.

- organizing meetings and discussions at the Production Manager and Senior Assistant level, on specific technical problems.

But it is necessary that :

- Practical steps follow these meetings.

- To affirm once again that the responsibility of the Mill is, and remainscompletely, of the actual Management Board.

borghi e baldo ingg.
s.p.a.

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Capitale sociale L. 560.000.000
Sede legale: corso Italia 8 - Milano

ANNEX I/A

Mr. Ashraf Ali
Dy. General Manger,
Bangladesh Jute Mills
Gherasal, Dacca

Milan, 17th April 1979

Dear Sirs,

Referring to our letter dated 14/4/79, at point 1 (morrah weights), the new checking done by our counterparts on the standard weight fixed by your mill has given these results = 30% of tests in standard weight, 70% of tests lower as the above.

In the meantime our advice is to maintain this high standard weight only as a temporary measure, due to the condition of wear and tear of the fluted rollers of your softeners, just to give your mill the necessary time to do a complete overhauling of your machines, so that it will be possible to go back to the original standard weight of morrahs, that is 2-2½% lbs. This overhauling should include a complete change of your rollers, bushes, etc., according to the mechanical report of our mechanical engineer, which you will find attached to this letter.

Yours faithfully,

Ruggero Mazzali

Team Leader
UNIDO Productivity Team

cc to :

1. Dr. Ihab A.H. Ascar, UNIDO Project Manager.
2. Mr. Aminul Haque, G.M. (PP), BJMC, Dacca.
3. Productivity Team Counterparts.
4. File.

telefono: 8579
telegrammi: Borghibaldo Milano
telex: 320033 BBMIL I

Reg. Impr. Milano 120521
c.c.i.a. 637523

JUTE SOFTENER

(1) The following defective spare parts are listed below :

- No feed conveyor is observed on the machine.
- The flutes of the feed rollers have been worn out, so that the diameter of the rollers decreased.
- The spiral rollers are also worn out : now they are not in a good workable position, as the flute tips has worn out so that improper softening action is caused.
- All the busher and bearings are seriously worn out and are no more suitable for proper work. Some gable stands have been broken due to vibration of rollers. Bevel pinion tooths are worn out in the gear, contact is not the required one as diameter has been reduced.
- Delivery conditions : due to consequent JAMS, the workers have kept aside the delivery roller, so that now the machine is running without the delivery roller.
- There is no function of the tension springs and the rollers are moving only by self weight.
- There are no oil nipples and grease pipe line.

(2) Once every week the side shaft cover should be opened : side shaft and roller bevels should be cleaned and inspected for correct running and lubricated with correct grease.

Chain drives from engine (motor) to side shaft should be opened, chain should be cleaned and, if necessary, tension should be adjusted to rollers : tension spring settings should be checked and adjusted to the correct measurement.

(3) The oil level in the reduction gear box attached to the gear box should be inspected weekly and tapped up to the correct level oil. Oil changes should be carried out at intervals recommended by the manufacturer of the gear box.

Final consideration

The machine is running in a very rough condition.
All the spiral rollers and other necessary spare parts worn out (see point 1) should be changed as quickly as possible.

EXTRACT FROM MORRAH WEIGHT REPORT

PRODUCTIVITY TEAM PROPOSAL

(1) Due to the concrete impossibility of a general daily control on all the workers involved, we suggest a random daily checking. The workers who undergo the daily checking should be trained by the department Supervisors, with the same method employed by our Team. Consequently, there should be a daily rotation of the workers subject to control, so that in a certain time unit all the workers involved will be undergoing the training stage.

(2) This control system should be assumed as normal routine in every mill organization.

(3) When the departments situation will show a certain regular trend, it is up to the mill production Officers to take in right consideration the problems of the ratio between the morrahs weight and the Moisture Regain of raw jute.

(4) Consequently to point 2, in every morrah preparing department there should be at least two scales.

(5) We also recommend an unitary wages policy, so that all the workers of the Department involved, regardless of mills and zone, will earn the same pay : this to avoid problems similar to those arisen in Platinum Jute Mills .

borghi e baldo ingg.
s.p.a.

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Sede legale: corso Italia 8 - Milano

ANNEX 3

Mr. Ashraf Ali
Dy. General Manager
Bangladesh Jute Mills
Ghorasal, Dacca

Milan, 14th April 1979

Dear Sirs,

We would like to resume the discussion held on 2nd April in our Residence at your presence and with the assistance of our counterpart in your mill (Mr. Mannan, Mr. Islam, Mr. Rhowal) about the work done by our Team in Bangladesh Jute Mills.

1) Morrah Weight - We pointed out to your attention that, in spite of Training done by our counterparts at workers level normal morrah weight, which should be between 2 and 2½ lbs. is still out of standard range. We took note that due to the wear and tear of the fluted rollers of your softener machines, the standard weight of your morrahs should be increased to a weight between 3 and 3½ lbs. we instructed our counterparts to do new checkings on this basis.

2) Emulsion - We illustrated the various tests done in your mill about emulsion with different types of emulsifiers. We took note of the arrival of a new imported supply of Hostapol emulsifier, which in our opinion will give to your mill better results than previously : we instructed our counterparts to do the necessary tests, which will be submitted to your attention, and in the meantime we heard with satisfaction from your side the will of using in the future well known emulsifiers, as Hostapol or Nonidet P.40.

3) Piling - We have discussed with you the problem of the piling line and the importance of the same on the jute spinning processing. We have pointed out that due to the delivery at your Q.C. Office of suitable thermometers, our counterparts, with the aid of your Q.C. Officer, will

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s. p. a.

do new tests on piles of different types of jute (cut - uncut - cuttings) so to assume in a definite way the standard maturing time for each quality.

4) Carding - We took note of your request that the mechanical engineer of our Team in your mill should check and advise on the overhauling of your carding Unit, with the help of the mechanics of the mill. A report on this point will be handed to you at the end of the checking.

We took note with pleasure about your will to give whole hearted cooperation to our Team and we ensure about our best engagement in helping your mill to solve the different problems which are facing you.

Yours faithfully,

Ruggero MAZZALI

Productivity Team Leader
UNDP/UNIDO

borghi e baldo ingg.
s. p. a.

ANNEX 4

EXTRACTS FROM THE EMULSION REPORT

(PRODUCTIVITY) FINAL ADVICE

(1) Our first advice is to send an explicative Circular to all the Mills involved in the Project, Circular which will assert once and for all the stability concept and the manner to detect the same in simple and empirical way (see page 2 of general Notes).

(2) All new products employed should be previously tested on quality basis (see page 4 of General Notes).

(3) The supply of Jute Batching Oil and emulsifiers should be made in a Centralized way by BJMC, with consequent reduction of costs, and time supply and more safety on the quality of products supplied.

(4) Standard characteristics of Jute Batching Oil for Bangladesh should be worked out (see page 5 of Report).

(5) General advice should be given to all the mills to use condensed water; mechanical officers in each mill are quite able to study, for each mill, the possibility to draw pipelines from dressing department to emulsion Plants. Cost for this work appears trifling in ratio to results which can be achieved.

(6) Emulsifiers employed could be various. The important thing is they should be well known and original (i.e. imported or if bought on local market of good quality). Percentages of employ can vary accordingly, the

main problem is to take advice from Company maker : those percentages should be changed only after results taken from Tests, which should be carried out by a Technical Institute (see our proposal on page 6 of the Report).

Normal percentages are 0.5% for Rapisonic Plant and 1% for Conventional Plants.

(7) Temperature control during composition of emulsion should become normal routine for mill staff in charge.

(8) For Rapisonic Plants, it should be strongly recommended not to dilute previously the emulsifier in water : this will affect this chemical composition with the result of a lower impact in the emulsifier action. Moreover, for this type of Plant, which implies a % of employ of emulsifier lower than conventional plants, a correct mechanical control should be carried out as normal routine of mill maintenance : the cost for replacing spare parts on those plants is absolutely not comparative with the results which can be obtained by a proper working condition of the same Plants.

(9) For conventional Old Plants, it should be recommended to control the right position of blades in the principal Tank to avoid the possibility of a vacuum between the bottom of the tank and the first blade, vacuum which possibly could be filled with emulsifier (first agent to be put in Tank) which therefore will not be affected by a rotating movement of blades during emulsion composition process.

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s. p. a.

ANNEX 5/A

GENERAL MECHANICAL CONDITION OF THE RAPISONIC EMULSION PLANT

BANGLADESH JUTE MILL

The Rapisonic Emulsion Plant has been checked thoroughly. We are stating below the conditions :

a) Condition of bearing & bushes : though it is working since long its conditions are not bad, i.e. is workable position. It should be checked and overhauled once a month.

b) Condition of pump and piston : found leakage during its movement.

c) Vibration blade position : it is in good workable position.

d) Condition of supply pump and pipe line : it is in good position and creates no troubles. Cleaning of pipe line should be done once a week.

e) General checking & setting & Adjustment : it is also found satisfactory but there is no filter net in either of the tanks to suck up the impurities. There is a disconnected pipe line of Emulsifier to the tank like the water and oil lining. They are putting Emulsifier by hand in the bottom tank when required.

(See S.A.C./FRASER Report on the same Plant).

ANNEX 5/B

The Dy. General Manager
M/s. Bangladesh Jute Mills Ltd.
Ghorashal
Dacca

Milan, 30th April 1979

Dear Sirs,

Reference to your letter No. BJM/63/78-79/943 dated 15th April 1979, I visited your mill for checking and servicing of Emulsion Plant J5-PR358 on 25th April 1979. Findings of the said machine are given below :

1) All pumps i.e. Oil, water and Emulsifier pumps found leakage, which means irregular supply to mixer tank.

2) Filters of Oil, water and Emulsifier found absent which should be replaced immediately, which cause damage of Oil seals, valve, and valve seats.

3) All gear box should be filled up by oil periodically.

4) This machine should go for thorough overhauling immediately after getting the necessary spares in hand. The recommended spare parts list is enclosed herewith for your necessary action.

Thanking you.

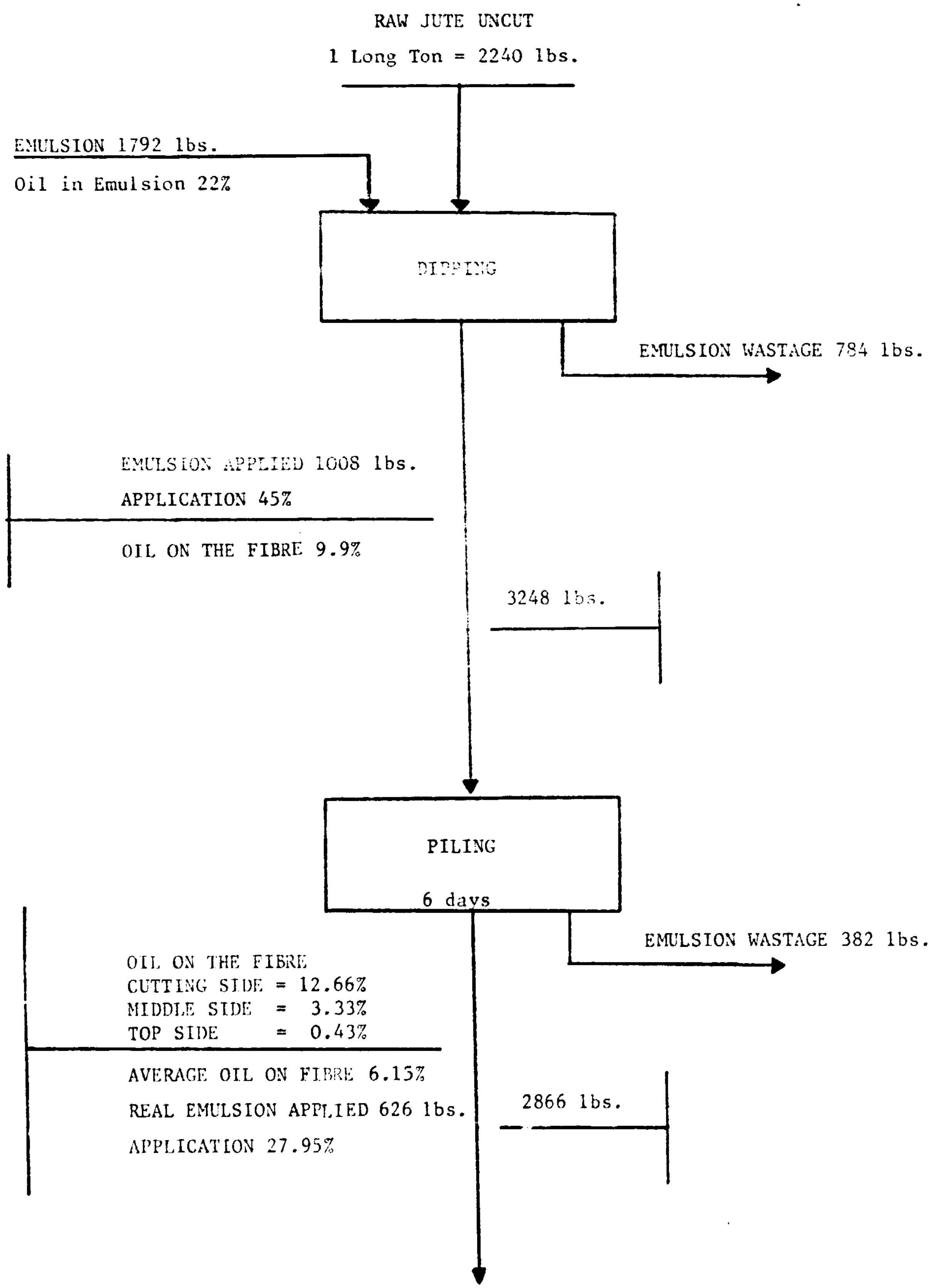
Yours faithfully,

For S.A.C. AGENCY

A.M. CHOW DHURY
FRASER'S SERVICE ENGIN.

cc to : The Counterparts UNIDO
Bangladesh Jute Mills Ltd.
Ghorashal, Dacca

ANNEX 6


RAW JUTE UNCUT
1 Long Ton = 2240 lbs.
EMULSION 1792 lbs.
Oil in Emulsion 22%
DIPPING
EMULSION WASTAGE 784 lbs.
EMULSION APPLIED 1008 lbs.
APPLICATION 45%
OIL ON THE FIBRE 9.9%
3248 lbs.
PILING
6 days
EMULSION WASTAGE 382 lbs.
OIL ON THE FIBRE
CUTTING SIDE = 12.66%
MIDDLE SIDE = 3.33%
TOP SIDE = 0.43%
AVERAGE OIL ON FIBRE 6.15%
REAL EMULSION APPLIED 626 lbs.
APPLICATION 27.95%
2866 lbs.

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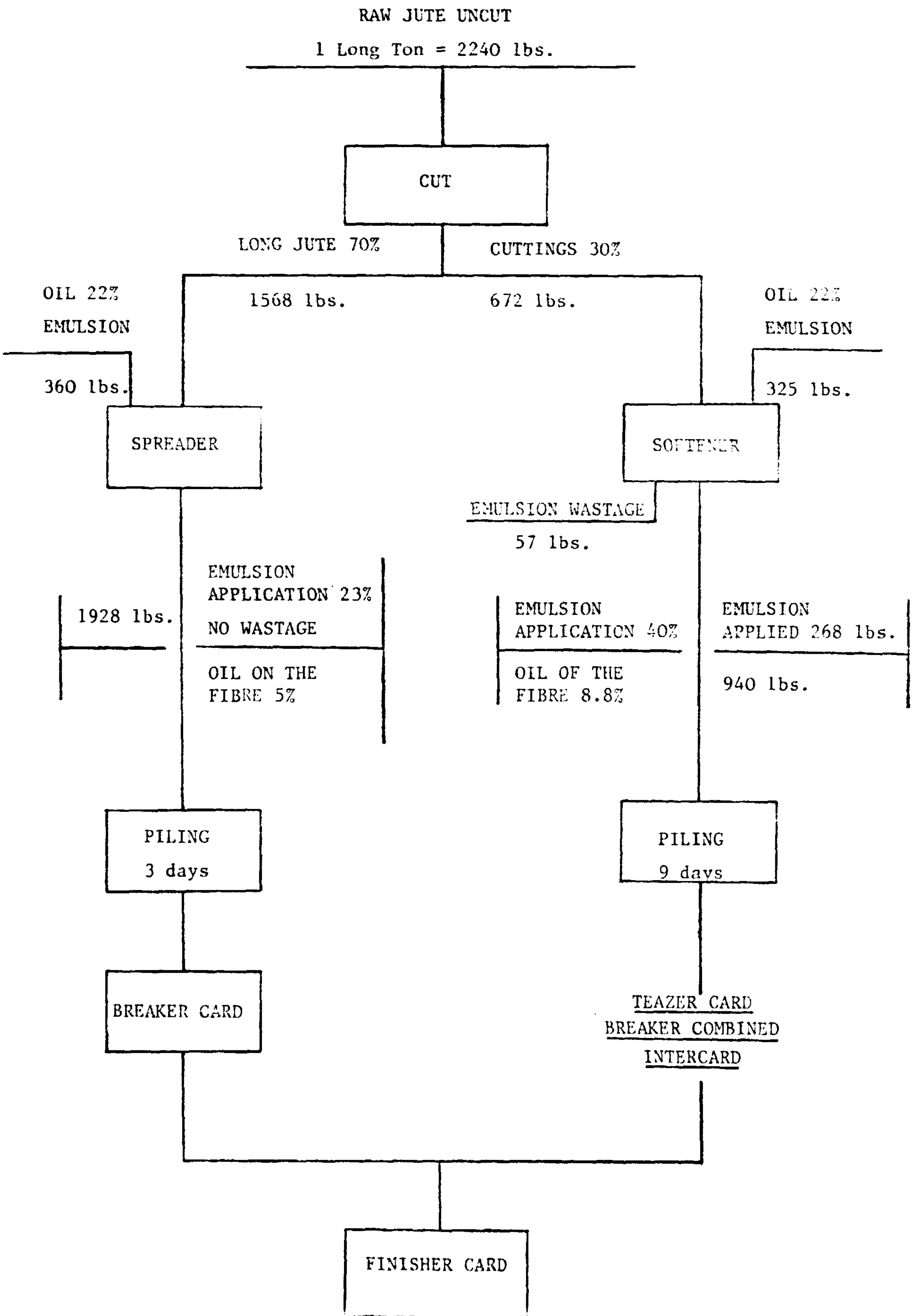
spa



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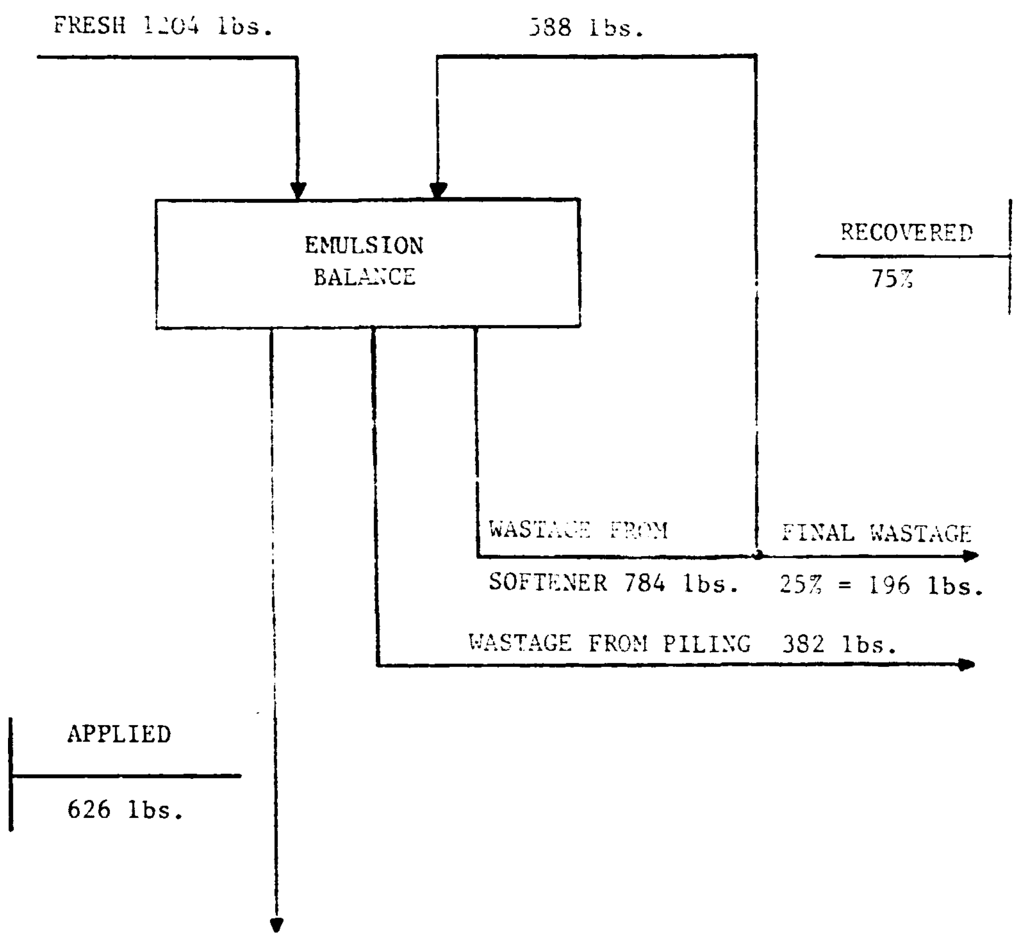
ANNEX 8

DIPPING SYSTEM

- 1 Long Ton raw jute = 2240 lbs. -



OVERALL INPUT

- Fresh	= 1204 lbs.	= 67.2%
- Recovered	= 588 lbs.	= 32.8%
TOTAL	= 1792 lbs.	= 100%

OVERALL OUTPUT

- Applied	= 626 lbs.	= 34.9%
- To be recovered	= 588 lbs.	= 32.8%
- Wastage	= 578 lbs.	= 32.2%
TOTAL	= 1792 lbs.	= 100%

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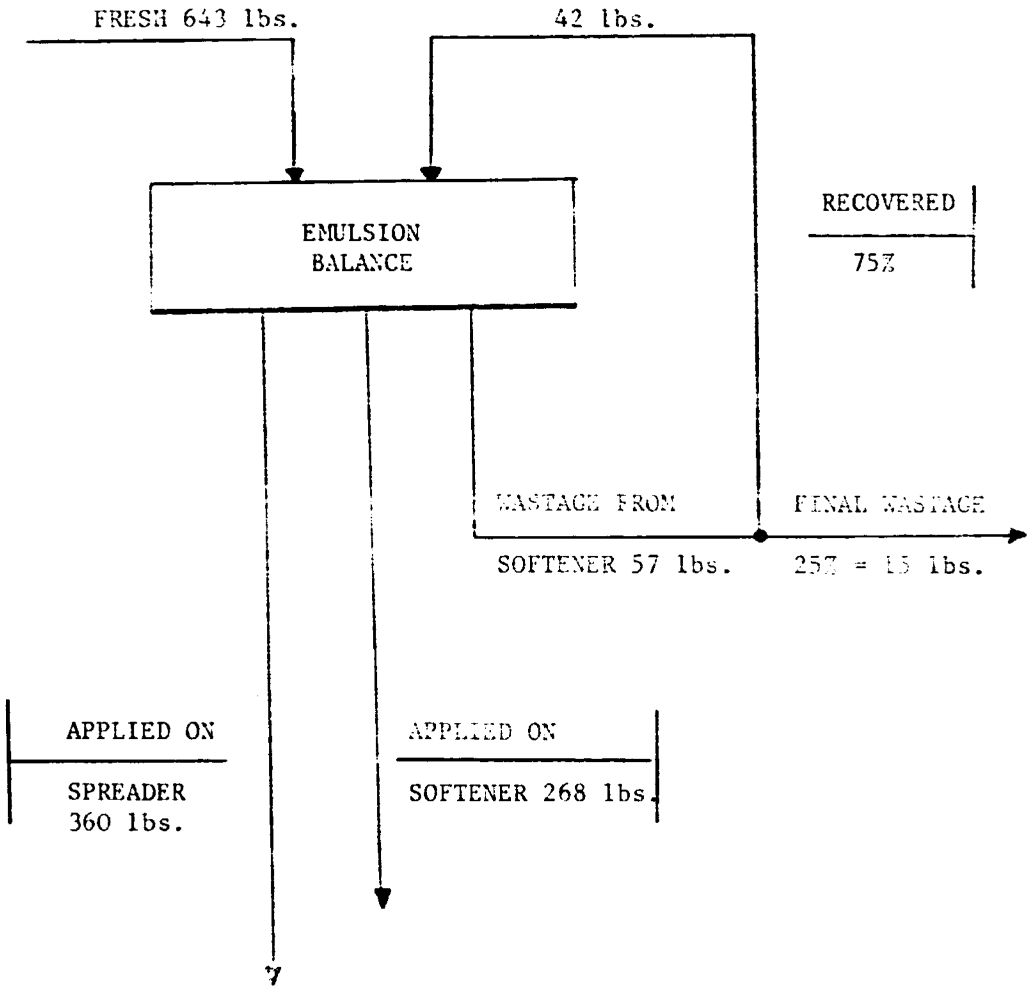
s.p.a.

ANNEX 9

OUR PROPOSAL

- 1 Long Ton raw jute = 2240 lbs. -



OVERALL INPUT			OVERALL OUTPUT		
- Fresh	= 643 lbs.	= 93.9%	- Applied	= 628 lbs.	= 91.7%
- Recovered	= 42 lbs.	= 6.1%	- To be recovered	= 42 lbs.	= 6.1%
			- Wastage	= 15 lbs.	= 2.2%
TOTAL	= 685 lbs.	= 100%	TOTAL	= 685 lbs.	= 100%

REMARKS

Less consumption of fresh emulsion. 1204 - 643 = 561 lbs.

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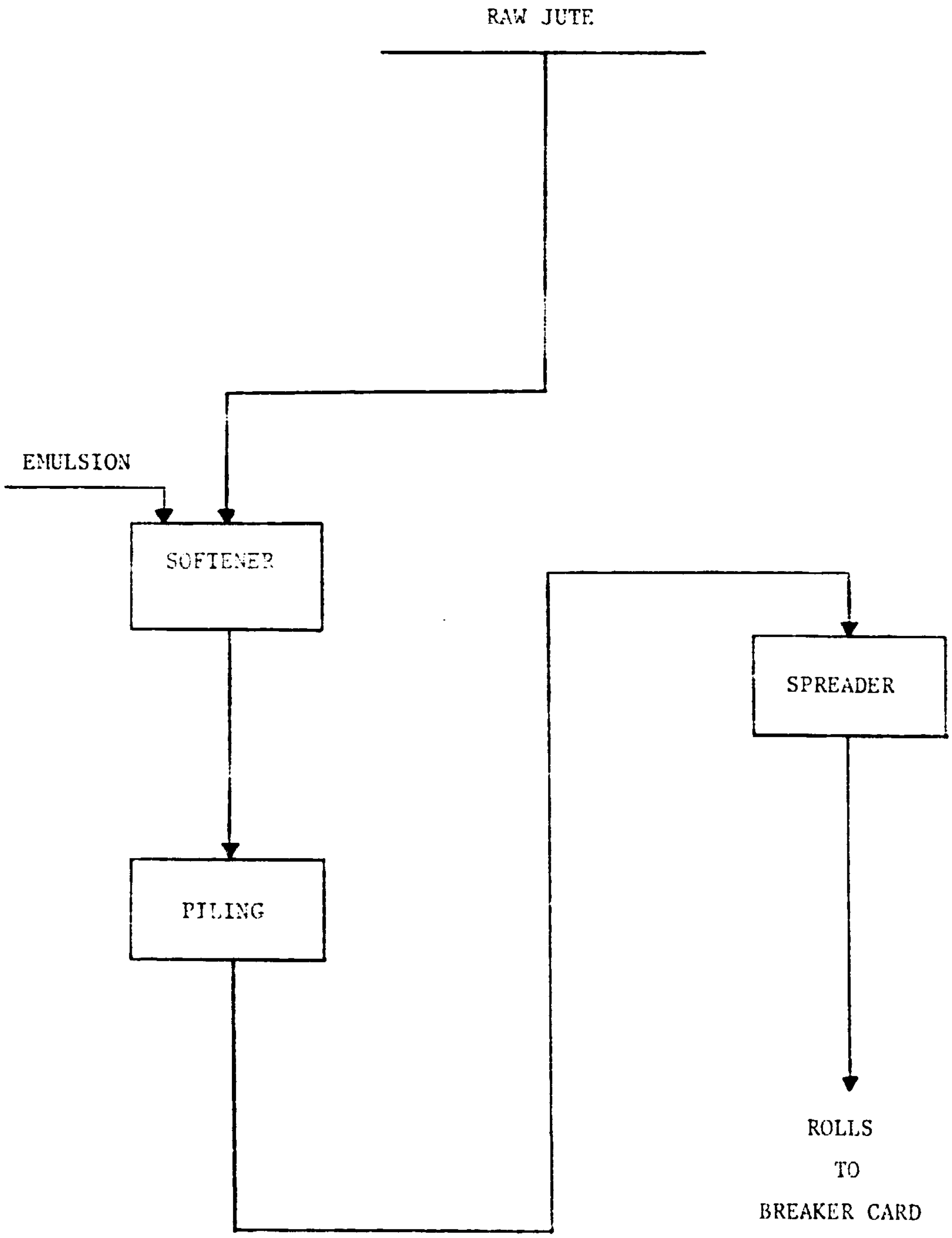
s.p.a.

ANNEX 10



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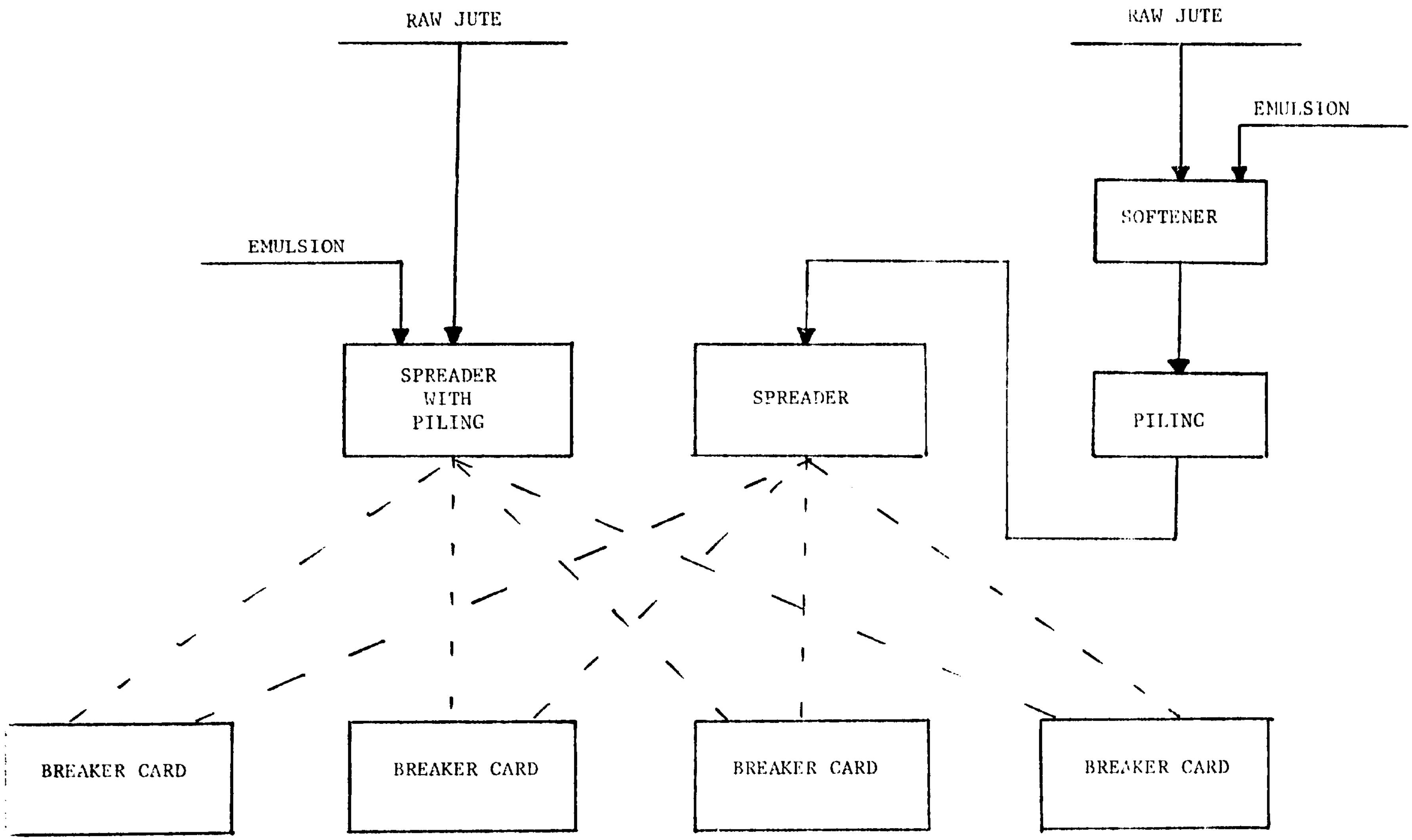
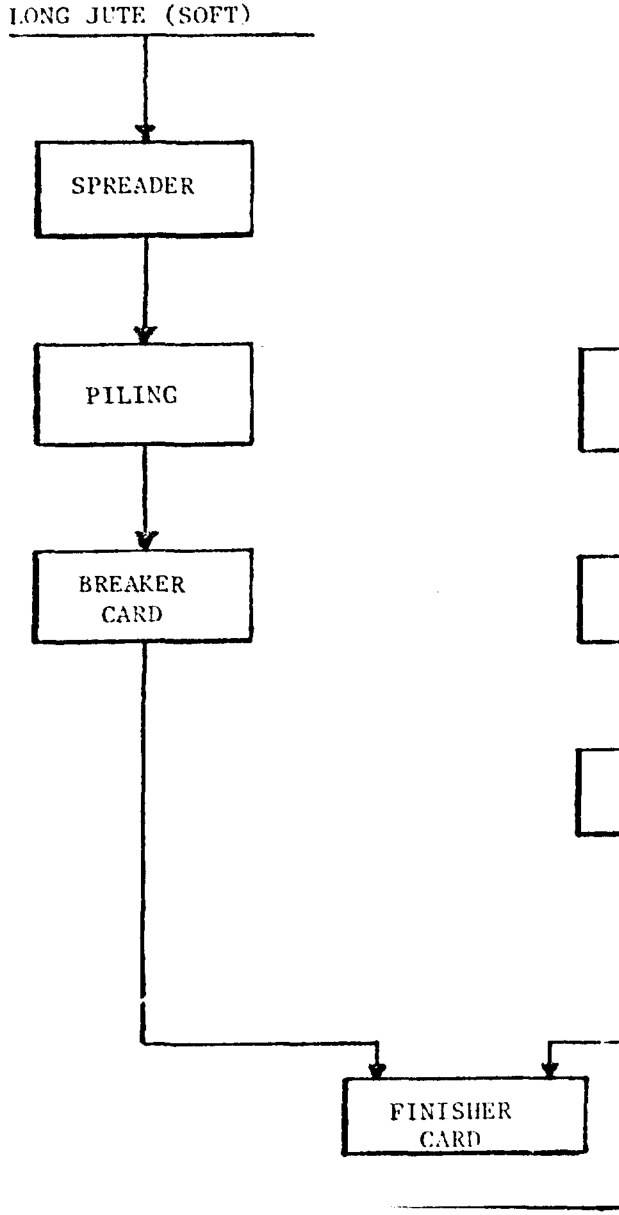
s.p.a.



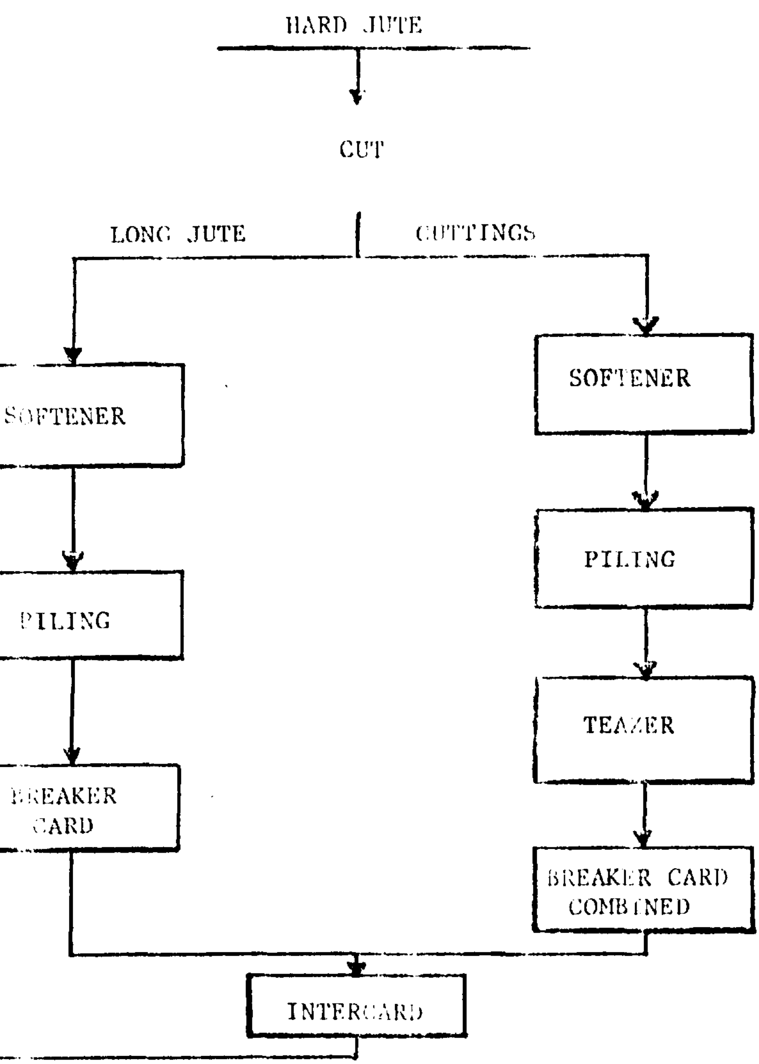
ANNEX 11



LONG JUTE (SOFT)
SPREADER
PILING
BREAKER CARD
FINISHER CARD

borghi e baldo ingg. s.p.a.

ANNEX 12



ANNEX 15

To:

Dr. R. Mazzali
UNDP/UNIDO Productivity Team Leader
BJMC, Motijheel
DACCA

26/6/79

Subject: Report on Bangladesh Jute Mills

Dear Sir,

Reference the report of the Project N°. BGD/73/043 dated 22/5/79, I would like to have a discussion on this report with you. Please give me a suitable date and time with an intimation to DGM, Bangladesh Jute Mills, so that we can meet and discuss the report thoroughly.

Thanking you,

Yours faithfully,

A.M. Aminul Haque
General Manager (PP)

c.c.

1. Director (PP), BJMC, Dacca
2. Dr. I.H. Ascar, Project Manager, UNDP, BJMC, Dacca
3. Dy. General Manager Bangladesh Jute Mills. - You are requested to attend the meeting.

borghi e baldo ingg.
spa

ANNEX 14

To:

Mr. A.M. Aminul Haque
General Manager (PP)
BJMC, Adamjee Court
Dacca.

28th. June 1979

Subject: Report on Bangladesh Jute Mills

Dear Sir,

Referring to your letter of 26/6/79, we will be at your disposal for the meeting you asked for on Thursday 5th. July 1979 at 9.30 a.m. in the Productivity Team's office.

Looking forward to meeting you,

Yours faithfully,

R. MAZZALI
Pro. Team Leader
UNDP/UNIDO BJMC, Adamjee Court,
Dacca

c.c.:
1. Director (PP), BJMC, Dacca
2. Dr. I.H. Ascar, Project Manager, UNDP, BJMC, Dacca
3. Dy. General Manager, Bangladesh Jute Mills - You are requested to attend the meeting.

ANNEX III

borghi e baldo ingg.
s.p.a.

Capitale sociale L. 560.000.000
Sede legale: corso Italia 8 - Milano

Consulenze e progettazioni industriali
via Amedei 15 - 20123 Milano

Mr. K.R. Hassan
Deputy General Manager
Dacca Jute Mills
DACCA

Milan, 31st July 1979

Subject : Report on Dacca Jute Mills

Dear Sirs,

Only to enclose our Report about Dacca Jute Mills in which you will find some specific proposals.

We look forward, in due time, to a meeting with you and your Production Manager to discuss our Report, and in the meantime, as you know, we are completely at your disposal with our counterparts to help your Mill Officers in any production problem that may arise in your Mill.

Looking forward to discuss everything in our next meeting,

Yours sincerely,

L. GALLETTI
Productivity Team Expert
UNDP/UNIDO

Distribution:

1) Mr. S.Y. Bakht, Director PP, BJMC.
2) General Manager, Dacca Zone I, BJMC, Dacca.
3) Mr. Aminul Haque, General Manager, PP, BJMC.
4) Counterpart, Dacca Jute Mills.
5) File.
6) Dr. Ihab A.H. Ascar, UNIDO Project Manager, BJMC, Dacca.

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REPORT ON DACCA JUTE MILL

1.A) Morrah weight

On the 4th July 1979, the Team counterparts ran a series of tests, at random. The results are shown and analyzed on Annex 1. We remark that :

a) the average weight of all the tests is inside the standard range, but

b) only 50% of tests is inside the range, so that

c) CV = (Variation Coefficient) appears too high, i.e. it shows a great irregularity, which will result in irregularity on softeners feeding, on oil application, on fibre, on piling, on carding and ultimately on yarn production.

- Taking into consideration that morrahs operation is a hand-made work, we can take as acceptable the following value :

$$CV = 5 \div 7.5\%$$

- We should remember that our Team has already run for almost 2 months and in 2 different periods of time, practical training courses to all the workers present in the department: in the immediate period following the training, on 600 checkings 84% was showing inside the standard range.

1.B) Productivity Team Proposals

- We point outthat the Productivity Team, on the 20th of April produced a general Report on this particular problem, with specified proposals.

- We enclose copy of pages of the above Report (ANNEX 2 with our general proposals.

- Referring particularly to Dacca Jute Mill, the Quality Control Officer and the mill Officers in charge of the Batching Department should run, jointly, daily checkings, worker after worker, to detect the particular trends and faults of the single workers and to take the consequent steps to remove them. Moreover they should train the new workers assigned to the department, to show them exactly what their work should be.

2.A) Emulsion

- It is made in a conventional Mackie plant, utilizing :

  -- normal water
  -- Nonidet P. 40 as emulsifier
  -- J.B.O., supplied through Agency.

- The proportions of those elements, normally applied in the emulsion of Dacca Jute Mill, are shown in Annex 3.

- Stability of the emulsion is checked properly by the Quality Control Department = the first breaking is checked referring to the coming out of water on the bottom of the scaled bottle. The period of time required to obtain this result is taken as stability time.

- The actual stability time is of about 30 - 40 minutes, that is too low and cannot be acceptable.

- Without an emulsion stable for almost 24 hours, it is impossible to achieve an uniform application of oil on fibre.

- With a desired uniform application, a continuous lubricated coat will be formed on the fibre, which will assure a uniform maturing process of jute during the piling and a good carding process, with pins combing the fibre without any tear. In fact an emulsion not stable will result in a bad oil distribution and in a showing of water on fibre. Water, having no lubricant power, will therefore, cause a very bad carding process.

- We wish to point out that, without a Jute Batching Oil of good quality, it will be never possible to obtain a stable and correct emulsion.

- Dacca Jute Mill is buying his own Jute Batching Oil through Agency, exactly the GEMONA Agency - supplies are taken in the mill once a week, normally, and delivered in barrels.

- The last supply showed a very poor quality, due to :

  -- very dark colour
  -- strong smell of kerosene
  -- visible presence of sediments in oil.

  The first two factors are pointing out a mingling with Kerosene, i.e. with a distillate at lower temperature, resulting in a J.B.O.

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with characteristics (specific gravity and viscosity) completely different from the normal ones.

The presence of sediments is sign of bad filtering, of use of dirty containers, etc. This factor is particularly harmful to the working process, since it prevents the making of a stable emulsion.

2.B) Productivity Team Proposals

- The productivity Team has already produced on the 3rd of May a general Report on this subject, with different remarks and proposals.

- We enclose copy of page 10/11 of the Report (See Annex 4), with our general proposals.

- We enclose also copy of Annex 1 and 11 of the same report (see Annex 5/A - 5/B), with the results of tests made at Dacca Jute Mill with different percentages of emulsifier Nonidet P.40.

- In particular for Dacca Jute Mill, we recommended :

  -- to use condensed water
  -- to use emulsifier Nonidet P.40 at about 1%
  -- to carry out regularly the maintenance and the cleaning of the emulsion plant and of pipelines.

- As for the J.B.O. problem, we think it is too serious and important to be solved at mill level. We consider however essential that the

Mill should :

-- carry out, in the Q.C. Laboratory, all the possible tests (colour, smell, specific gravity, viscosity, sediments presence) on every supply of Jute Batching Oil.

-- send the results of the above test, with a sample, to the concerned BJMC Department.

- The problem of Jute Batching Oil quality and its particular chemical-physical characteristics can be solved only at BJMC level, on a national scale.

3.A) Emulsion Application and Wastage

- The Productivity Team has run many tests on the application of emulsion on fibre.

- We enclose the most meaningful (see Annex 6 - 7)

- On the test results we can remark :

a) The oil percentage checked in the emulsion varies in a notable way from test to test, and is always much lower than the percentage applied during the emulsion preparation (see in comparison Annex 3). This is caused mainly by a very poor stability of the emulsion itself and by an exceeding quality of emulsion wastage put back in process. It should be taken in account that recovered emulsion is almost totally "broken", besides being polluted from different foreign elements, collected during its first processing cycle.

b) The percentages of emulsion and oil <u>applied to the fibre</u> seem to vary in a notable way, besides being below the normal figures.
This is caused by a great unevenness in the softeners feeding, in the morrahs weights, in the emulsion flow and in the oil percentage on the same.

c) The oil percentage on fibre is always below the required figure for hard jute (cuttings and roots), which should reach 8-9% for a good processing.

d) Between the average length of jute fed in a determined time period and the length of the feeding cloth of softener machine running in the same period there is an obvious disproportion. As a consequence, at least one third of emulsion is not properly applied to the fibre and will increase the processing wastage.

e) The emulsion flow varies from softener to softener. This could be caused from dirt in the pipeline but mainly from lack of proper gauge valves on the machines.

3.B) <u>Productivity Team Proposals</u>

- On this particular problem, the Productivity Team is issuing on those same days a general Report.

- For the Dacca Jute Mill, we recommend :

  a) minimize the emulsion wastages

  b) cut the jute roots and process them separately in proper way making the final batch on the Finisher Cards.

To achieve the first point, it should be kept in proper consideration :

-- Softeners should be always fed by double feeder. (In case of production excess, it will be better to leave the machines idle for some hours).

-- The speed of the machine should be proportionate to the average total length of jute fed, so that all the feeding cloth should be covered without gaps between one morrahs and the following one:

--- the emulsion flow should be proportionate to the quantity of jute fed, referring to the final oil percentage desired on the fibre.

-- the emulsion flow should be adjusted by proper gauge valves, better if these valves are automatic ones, i.e. able to stop the flow at the machine arrest. (As suggested by our Team, these valves are now under way of construction in the Mill workshop).

-- the workers feeding the softeners should be checked and trained daily, to achieve, before long, a feeding rhythm as much as possible uniform.

Regarding the emulsion wastages, we would like to point out :

-- according to Mill Officers, in Dacca Jute Mills about 9 tons of emulsion are made daily, in comparison with a total spinning production of about 32 tons by day.

-- The emulsion balance can be read as in Annex 8A, assuming to put back in processing about 75% of wastages, with an average application of 25%.

-- From the above emulsion balance it shows that the emulsion used in processing contains at least 25% of wastage and that the total amount of daily emulsion exceeds by 13% the actual requirement.

If it should be possible to reduce the total wastages by about 70%, taking in proper consideration our practical proposals, then the emulsion balance will be read as in Annex 8/B. It shows that the emulsion used in processing contains only 9.78% of wastage and that the total amount of daily emulsion exceeds the actual requirement by only 3.75%.

- About the second point of our proposals, root cutting, we would like to insist particularly on the subject. We will point out :

-- the soft part of jute fibre require about 4-5% of oil, from 4 to 5 days of piling, and only one passage through Breaker Card.

-- the hard part of jute fibre (roots) requires about 8 - 9% of oil, from 7 to 10 days of piling, two and sometimes three passages through Breaker Cards (or Teaser or Combined Cards).

It is our steady opinion that, to fulfil those different technical terms, there is only one processing way, that is cut the roots and process them separately.

The higher costs which will arise, from Batching to carding Department will be largely compensated from :

- less emulsion consumption
- higher production efficiency
- less processing wastages
- better quality of yarn produced

4.A) Piling and Processing

- The Productivity Team has run many tests, jointly with the Q.C. Department of the Mill, on the temperature increase of jute under piling.

- We enclose the results of some of those tests (see Annex 9A/9B).

- We can remark that the final temperature of piles of soft jute is of about 60°C with an increase of only 20°C in 3-4 days, starting from a temperature of about 40°C.

- Even the cuttings piles are not showing higher temperatures, at the moment of their opening (see Annex 10).

- We consider these data an obvious sign of poor jute maturing, since, according to our experience, starting from 40°C, it should be reached at least :

  65 - 70°C for soft jute
  75 - 80°C for cuttings

- Mill No. 1, on Dacca Jute Mill, has a daily average spinning production of about 24 tons.

  According to Mill Officers, the daily quantity of jute under piling is of about 6I-65 tons. This amount is absolutely insufficient. The above data show also that not all the jute processed is put on piles or that the piling period is lower than the normal one.

The rotating index should be :

$$\frac{\text{Quantity of jute under piling}}{\text{Average daily production}} = \text{at least } 4\text{-}5$$

- The actual index shows a figure of 3.

- To reach a normal value, at least 100-120 tons should be kept daily under piling.

- About processing, we quote two different cases of processing 2 different jute qualities (see Annex 11).

- In the case of Tossa C Bottom, we point out 2 serious faults:

  -- the soft part of the fibre is processed on the Breaker cards, <u>without any piling</u>

  -- cuttings are piled after an insufficient application of oil (see Annex 6).

  In the case of White X Bottom, we point out :

  -- the piling period of 4-5 days could be sufficient for the soft part of jute, but not for the root parts.

  -- application of extra-emulsion by hand-spray escapes any check whether of quantity or of quality.

- The problem of piling, in Dacca Jute Mill, shows some main points:

  -- poor maturing of jute piled: this is mainly due to bad quality of emulsion and to uneven application.

  -- in some cases, completely lack of piling: this is mainly due to lack of space in the Mill and to wrong way of processing applied to some qualities of jute.

4.B) Productivity Team Proposal

- In the 4.A) paragraph we have already pointed out many advices which will improve the piling process in Dacca Jute Mill.
  We would like to insist for :
  - correct emulsion with proper oil percentage on fibre, according to the type of fibre processed
  - uniform application of emulsion
  - different processing for soft jute - hard jute and cuttings (see Annex 12).

- About the problem of lack of space, we know that the new Management has already taken proper action to solve it.

- Our advice is to put in working operation the spreader, which lies idle in the mill : this machine could be utilized properly in Mill No. 2, due to the higher quality of jute processed.

  Using the spreader we can reach many advantages as :
  - better and more uniform application of emulsion
  - decrease of emulsion wastages
  - higher productivity
  - decrease of period of piling and consequently less floor space necessary for the piling itself.

- The last point, very important from the Dacca Jute Mill point of view, derives from the fact that the piling is formed by very compact rolls: those rolls are requiring less floor space than normal piles, moreover, they are requiring 1 - 2 days less piling time. As a consequence, the amount to be piled can be proportionately reduced.

- Installing the spreader, the mill should take into account :
  -- costs for machine installation
  -- costs for conversion of 2 Breaker cards from hand-feeding to tolls feeding. But we believe that those costs will be easily compensated by the above detailed advantages and by a better uniformity of all the process.

5.A) Beaming

- On this point we take in consideration a problem which, at this stage of Productivity Team work, has not been subject to particular Report.

  Any way we would like to point out the following remarks :
  -- in Mill No. 1, of Dacca Jute Mill, are installed beaming machines with creels and rolling system
  -- it is well known that this system of winding off is by this time technically out of date, because it causes :
    a) low productivity
    b) notable difference in the yarn tension, during the winding off from the spool.

In Dacca Jute Mill this system is worsened by a great number of spools, loaded on the creels, with their axis perpendicular to the axis of beam winding (see Annex 13). This way of loading is not correct, because it will increase the difference of tension on the yarn, during the winding off, and consequently it will cause a skipping motion on the spools.

This factor shows very clearly looking the draft in Annex 13:

-- The yarn is driven by a constant traction from the beaming machine.

-- Instead the thrust put on each spool, which cause the rotation of the same, varies from a maximum when the yarn is winding off in the A1 - C position to a minimum when the yarn is winding off in the A3 - C position.

-- As a consequence, each spool undergoes a series of impulses and the yarn is winding off, in the stretch from A1 to A3, at a speed higher than the beam winding speed, compensating in this way the difference of length between A1 - C and A3 - C and loosening the tension of the yarn itself. In the stretch from A3 to A1 the contrary will happen.

-- It is our opinion that, with winding off of this type and spools loaded in this way, it never will be possible to obtain beams sufficiently compact and uniform.

5.B) <u>Productivity Team Proposals</u>

- We do not think it would be possible, at the moment, to change the beaming machines with other ones, more up to date and technically efficient.

- However, we consider essential that the creels should be altered, so that all the spools will rotate in the most uniform way.

- To obtain this, it will be necessary that :

  -- all the spools should be loaded with their axis almost parallel to the beam winding axis.

  -- the yarn should go through a predetermined spot, on the middle axis of the spool (see Annex 14).

  Looking the draft in Annex 14, it is easy to understand that:

  -- the variations of tension on the spool, of yarn winding off and of yarn tension have a frequency twice as the previous one, but

  -- the differences between highest and lowest valves are greatly reduced (almost 4 times).

- With the above system the beams will still not be perfect but faults will be greatly reduced.

6. SUPERVISION

We believe that also in Dacca Jute Mills supervision should be increased, both for quality and quantity at least for the first stages of the processing.

FINAL COMMENT

The Productivity Team is taking in right consideration the concern and the co-operation of the Mill Management.

The Team is completely available to give all its help to solve the problems stated in the present Report or other ones which could be stated by the Management itself.

25.7.1979

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s.p.a.

ANNEX 1

DACCA JUTE MILLS LTD.
JASRABAD - DACCA

Dated 4. 7. 1979.

WEIGHT TEST OF INDIVIDUAL MORRAH OF JUTE FROM BATCHING DEPARTMENT OF MILL NO. 1 SUPPLIED BY THE JUTE DEPARTMENT

Quality of Jute : BWC

Std. weight of Morrah : 2.00 lbs to 2.5 lbs.

TESTS

1. 2.60 lbs.	6. 2.6 lbs.	11. 2.25 lbs.	16. 1.75 lbs.
2. 2.40 "	7. 2.75 "	12. 2.50 "	17. 2.25 "
3. 2.30 "	8. 2.00 "	13. 2.50 "	18. 1.75 "
4. 2.75 "	9. 2.00 "	14. 2.50 "	19. 2.60 "
5. 2.85 "	10. 2.25 "	15. 2.60 "	20. 2.75 "

Highest - 2.85 lbs.
Lowest - 1.75 lbs.
Range - 1.10 "

Average 2.39 lbs.
S.D. = 0.325

$$C.V = \frac{S.D}{Average} \times 100 = \frac{0.325}{2.39} \times 100 = 13.54$$

Number of Tests	=	20		
Below Standard	=	2	=	10%
Within Standard	=	10	=	50%
Above Standard	=	8	=	40%

ANNEX 2

PRODUCTIVITY TEAM PROPOSAL

(1) Due to the concrete impossibility of a general daily control on all the workers involved, we suggest a random daily checking The workers who undergo the daily checking should be trained by the department Supervisors, with the same method employed by our Team. Consequently, there should be a daily rotation of the workers subject to control, so that in a certain time unit all the workers involved will be undergoing the training stage.

(2) This control system should be assumed as normal routine in every mill organization.

(3) When the departments situation will show a certain regular trend, it is up to the mill production Officers to take in right consideration the problem of the ratio between the morrahs weight and the Moisture Regain of raw jute.

(4) Consequently to point 2, in every morrah preparing department there should be at least two scales.

(5) We also recommend an unitary wages policy, so that all the workers of the department involved, regardless of mills and zone, will earn the same pay : this to avoid problems similar to those arisen in Platinum Jute Mills.

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s.p.a.

ANNEX 3

31.5.1979

DACCA JUTE MILLS LTD.

HASNABAD, DACCA

EMULSION COMPOSITION AND PERCENTAGE WITH EFFECT FROM 31.5.1979

Oil	50 Gallons	= 50 x 8.5	= 425 lbs.	= 21.25%
Nonidet P.40			5 "	= 0.25%
Water	157 "	= 157 x 10	= 1570 "	= 78.50%
			2000 lbs.	100.00%

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ANNEX 4

FINAL ADVICE

(1) Our first advice is to send an explicative Circular to all the Mills involved in the Project, Circular which will assert once and for all the stability concept and the manner to detect the same in simple and empirical way (see page 2 of general Notes).

(2) All new products employed should be previously tested on stability basis (see Page 4 of General Notes).

(3) The supply of Jute Batching Oil and emulsifiers should be made in a Centralized way by BJMC, with consequent reduction of costs, and time supply and more safety on the quality of products supplied.

(4) Standard characteristics of Jute Batching Oil for Bangladesh should be worked out (see page 5 of Report).

(5) General advice should be given to all the mills to use condensed water: mechanical officers in each mill are quite able to study, for each mill, the possibility to draw pipelines from dressing department to emulsion Plants. Cost for this work appears trifling in ratio to results which can be achieved.

(6) Emulsifier employed could be various, the important thing is they should be well known ones and original (i.e. imported ones or if bought on local market of good quality). Percentages of employ can vary accordingly, the main problem is to take advice from Company maker : those percentages should be changed only after results taken from Tests,

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which should be carried out by a Technical Institute (see our proposal on page 6 of Report).
Normal percentages are 0.5% for Rapisonic Plant and 1% for Conventional Plants.

(7) Temperature control during composition of emulsion should become normal routine for mill staff in charge.

(8) For Rapisonic Plants, it should be strongly recommended not to dilute previously the emulsifier in water : this will affect its chemical composition with the result of a lower impact in the emulsifier action. Moreover, for this type of Plant, which implies a % of employ of emulsifier lower than conventional plants, a correct mechanical control should be carried out as normal routine of mill maintenance : the cost for replacing spare parts on these plants is absolutely not comparative with the results which can be obtained by a proper working condition of the same Plants.

(9) For Conventional Old Plants, it should be recommended to control the right position of blades in the principal Tank to avoid the possibility of a vacuum between the bottom of the tank and the first blade, vacuum which possibly could be filled with emulsifier (first agent to be put in Tank) which therefore will not be affected by rotating movement of blades during emulsion composition process.

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s.p.a.

ANNEX 5/A

Name of Mills : DACCA JUTE MILL

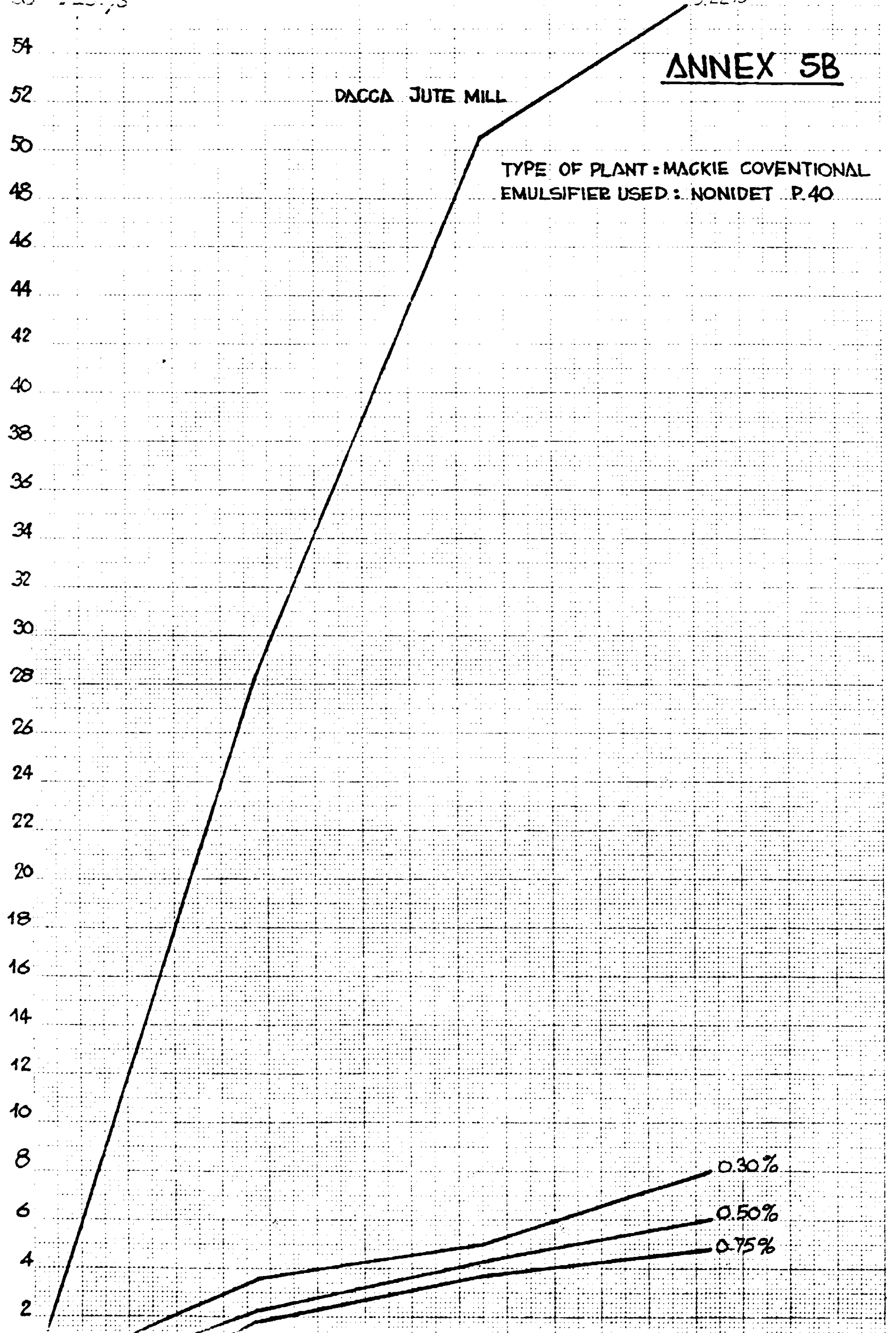
Type of Emulsion Plant : MACKIE ORDINARY

Name of Emulsifier used: NONIDET P.40

EMULSION BREAKING TEST REPORT

% of Emulsifier	Time taken to first Breakage (in minutes).	% D E C O M P O S I T I O N					
		After 4 hours	After 8 hours	After 12 hours	After 16 hours	After 20 hours	After 24 hours
0.125 (Actual percentage)	20	13.5	28	29	50	53.75	56
0.30	60	1.5	3.5	4.75	5	7	8
0.50	180	0.5	2.25	3.25	4.25	5	6
0.75	300	-	2	3	3.75	4.25	4.75

ANNEX 5B


DACCA JUTE MILL
TYPE OF PLANT : MACKIE COVENTIONAL
EMULSIFIER USED : NONIDET P.40
0.30%
0.50%
0.75%
HOURS
0 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24
0 2 4 6 8 10 12 14 16 18 20 22 24 26 28 30 32 34 36 38 40 42 44 46 48 50 52 54

ANNEX 6

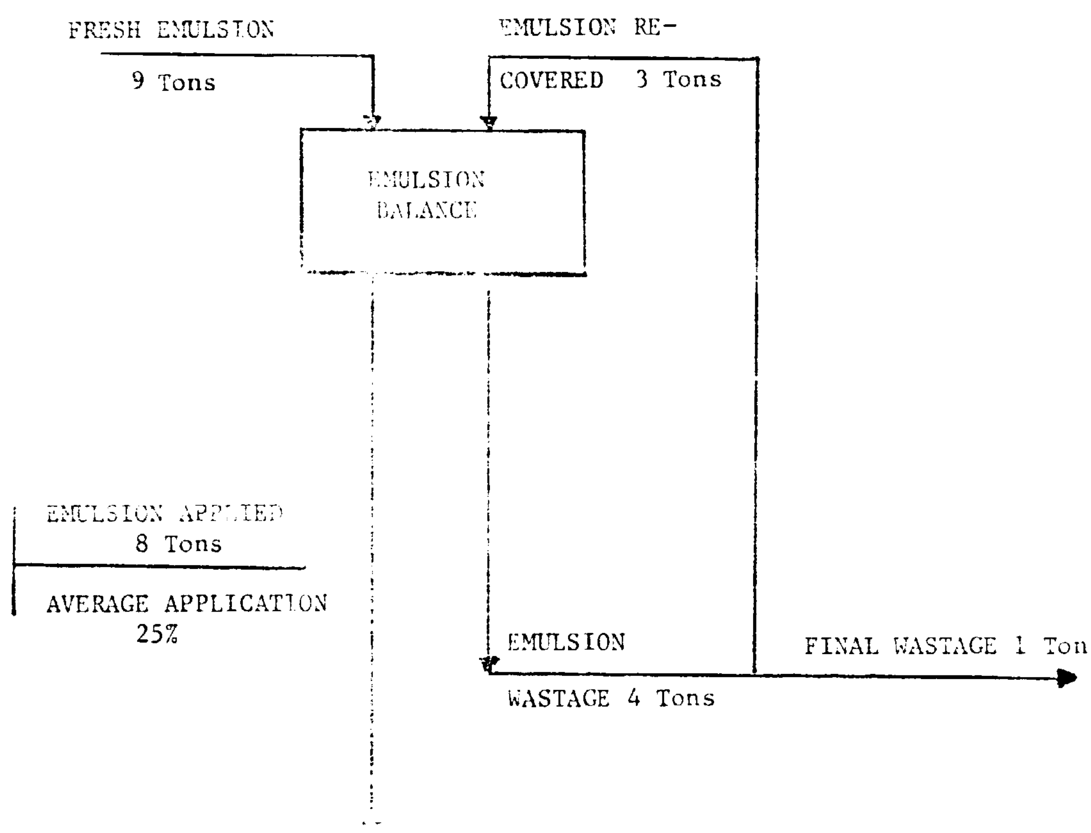
DACCA JUTE MILLS LTD.
HASNABAD, DACCA

Date from 26. 6. 79 to 2. 7.79

EMULSION APPLICATION TESTS

Quality of Jute	Quantity of Jute for Test	Softener Nt.	Shift	% of oil in Emulsion	% of Emulsion application	% of oil in jute
Tossa C Bottom	100 lbs	1	A	18	24	4.32
White X Bottom	100 lbs	2	A	17	31	5.27
B.W.C	100 lbs	1	A	15	22	3.30
Cuttings	100 lbs	3	A	18	38	6.84

Subjects	Way of calculation	Test 1	Test 2
1. Quality of jute		B.W.C.	White C. Bottom
2. Quality of jute	lbs	324	415
3. Softener machine	NR	1	2
4. Feeders	NR	2	2
5. Feeding speed of machine	(Yards/min)	25.2	23.5
6. Processing time	Minutes	16	18
7. Weight of jute at delivery	Lbs	403	548
8. Emulsion applied	(7-2) lbs	84	lbs 133
9. % Emulsion Applied	$(\frac{8}{2} \times 100)$	26	32
10. Rate of feeding	$(\frac{2}{6 \times 2.25})$	M/net. 9	M/net 10.25
11. Emulsion flow	lbs/minute	8	11
12. Feeding of machine	$(\frac{2}{6} \times 60)$	Lbs/h 1215	Lbs/h 1383
13. Production at delivery	$(\frac{7}{6} \times 60)$	" 1530	" 1826
14. Emulsion applied	(13 - 12)	" 315	" 443
15. Emulsion wastage	(11 x60 -14)	" 165	" 217
16. % of covered feeding cloth	$\frac{(10 \times 1.67)}{5} \times 100$	59	" 73
17. Emulsion utilised	$\frac{(14 \times 100)}{11 \times 60}$	65.6	67.12



OVERALL INPUT

- FRESH	= 9 Tons	= 75%
- RECOVERED	= 3 Tons	= 25%
TOTAL	12 Tons	= 100%

OVERALL OUTPUT

- APPLIED	= 8 Tons	= 67%
- TO BE RECOVERED	= 3 Tons	= 25%
- WASTAGE	= 1 Ton	= 8%
TOTAL	12 Tons	= 100%

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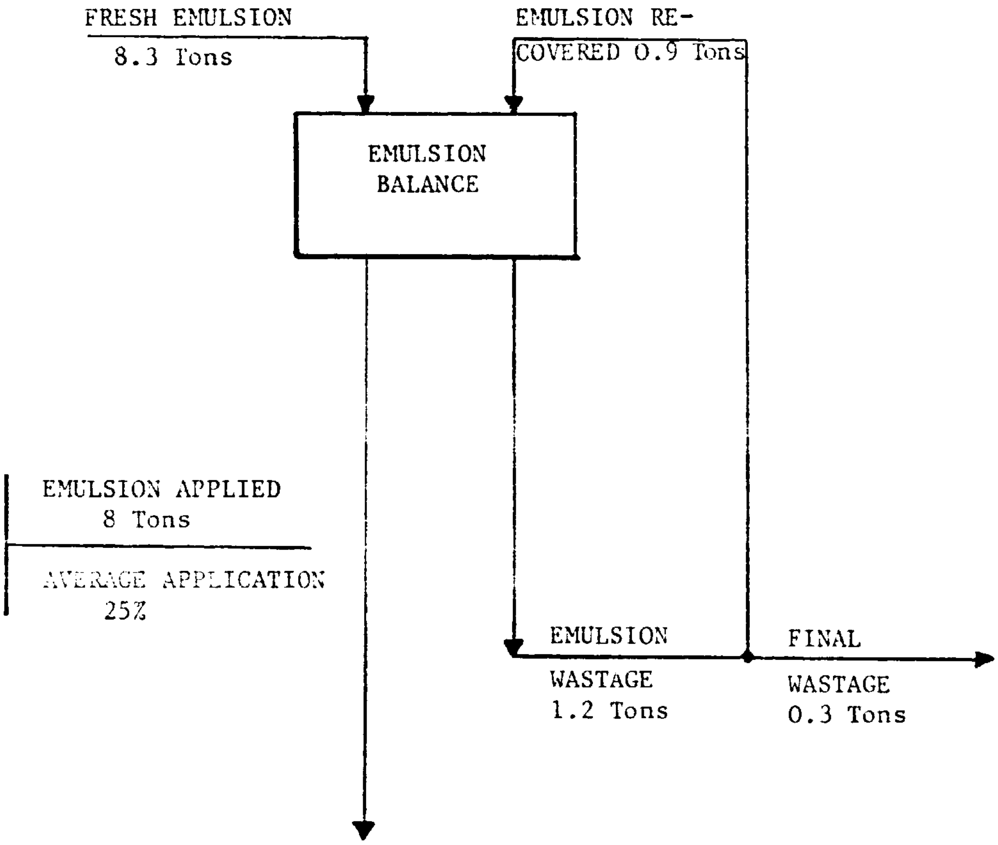
ANNEX 8/B



OVERALL INPUT

- FRESH	= 8.3 Tons	= 90.2%
- RECOVERED	= 0.9 Tons	= 9.8%
TOTAL	= 9.2 Tons	= 100%

OVERALL OUTPUT

- APPLIED	= 8 Tons	= 87%
- TO BE RECOVERED	= 0.9 Tons	= 9.8%
- WASTAGE	= 0.3 Tons	= 3.2%
TOTAL	= 9.2 Tons	= 100%

Bangladesh Jute Mills Corporation
UNDP/UNIDO Project No. BGD/73/043
QUALITY CONTROL

Name of the Mill: DACCA JUTE MILLS LTD.

Zone: 1

Av. Temperature Checking During Piling after 24 hrs.

Quality of Jute white "X" Bottom

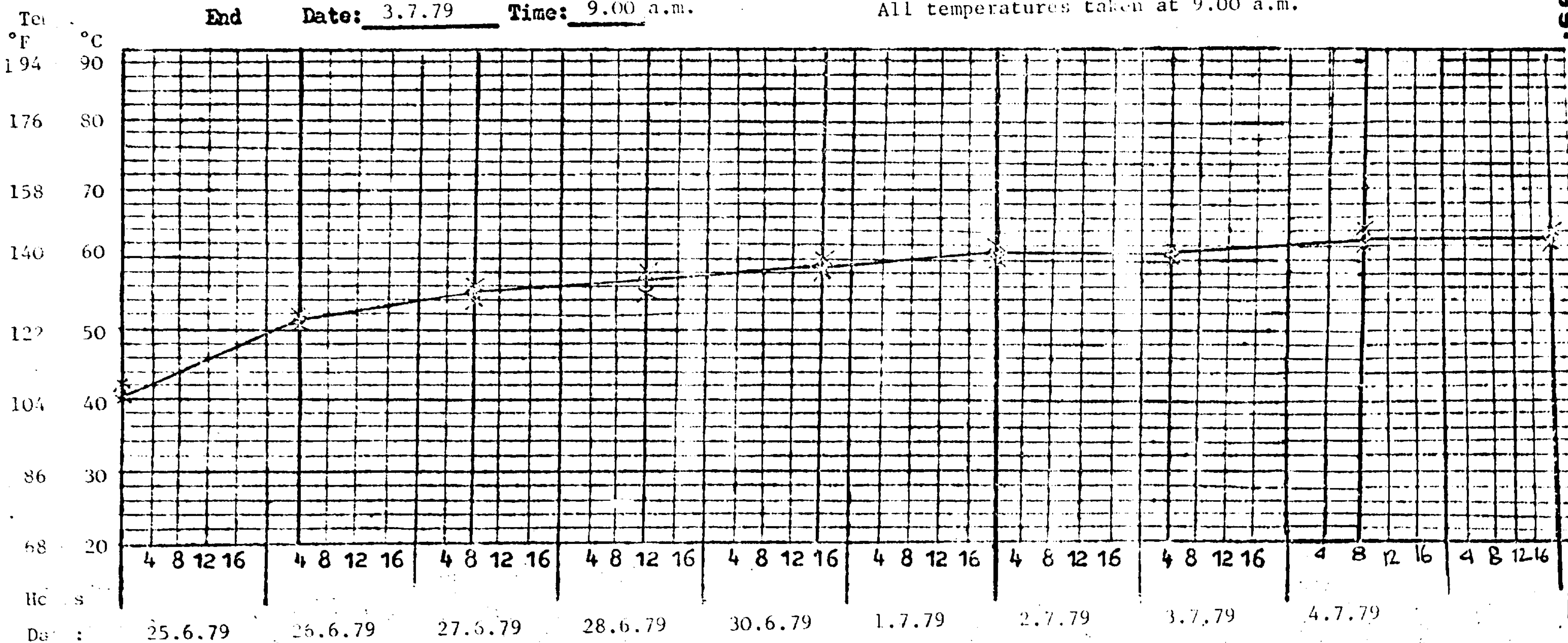
% of R.H. 74.55 Temp. 32.11°C.

Standard piling period:

Piling Starts Date: 24.6.79 Time:

End Date: 3.7.79 Time: 9.00 a.m.

All temperatures taken at 9.00 a.m.



QUALITY CONTROL OFFICER.

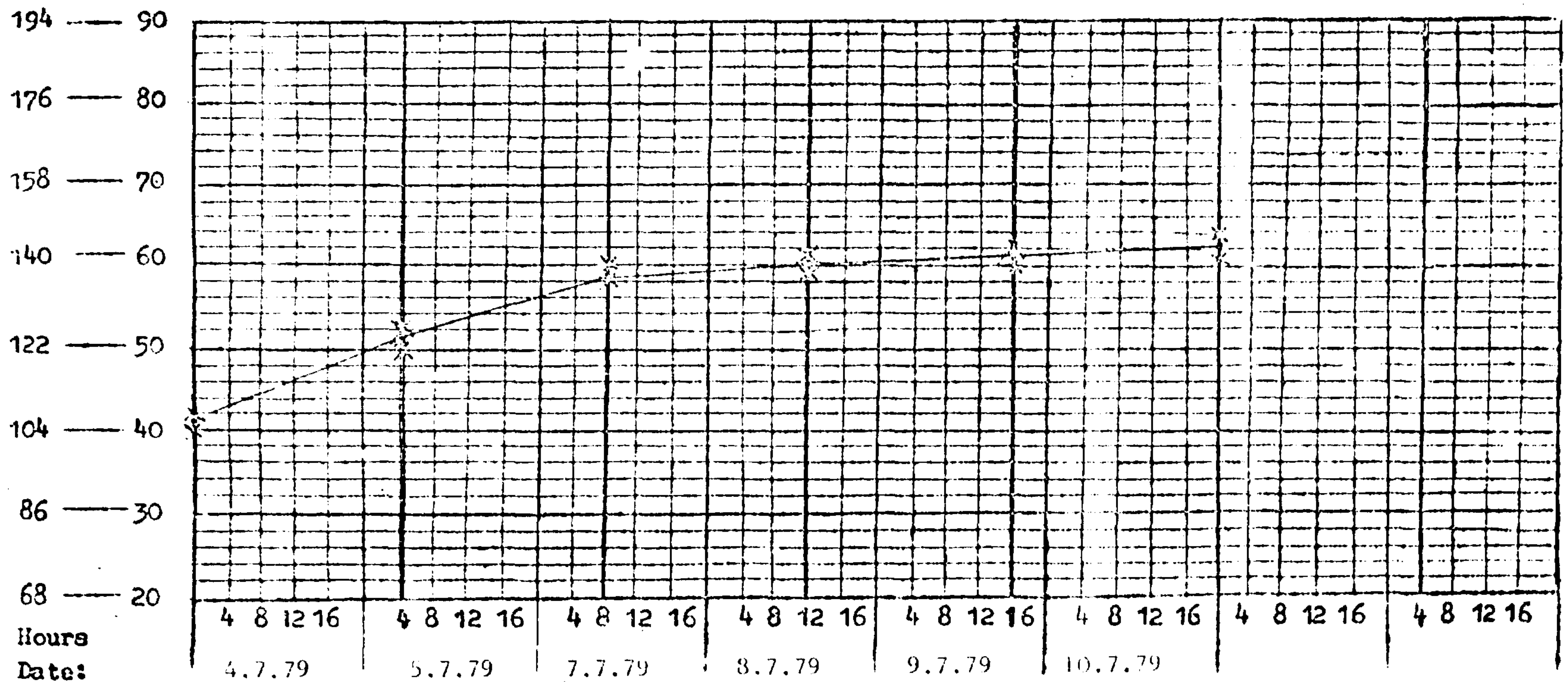
ANNEX 9/A

Bangladesh Jute Mills Corporation
UNDP/UNIDO Project No. BGD/73/043
QUALITY CONTROL

Name of the Mill: DACCA JUTE MILLS LTD.
Zone: 1

Av. Temperature Checking During Piling after 24 hrs.

Quality of Jute: White "C" Bottom
% of R.H. 76 Temp. 32.17
Standard piling period:
Piling Starts Date: 3.7.79 Time:
End Date: 10.7.79 Time: 8 a.m.
All temperatures taken at 10.00 a.m.



QUALITY CONTROL OFFICER

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ANNEX 9/3

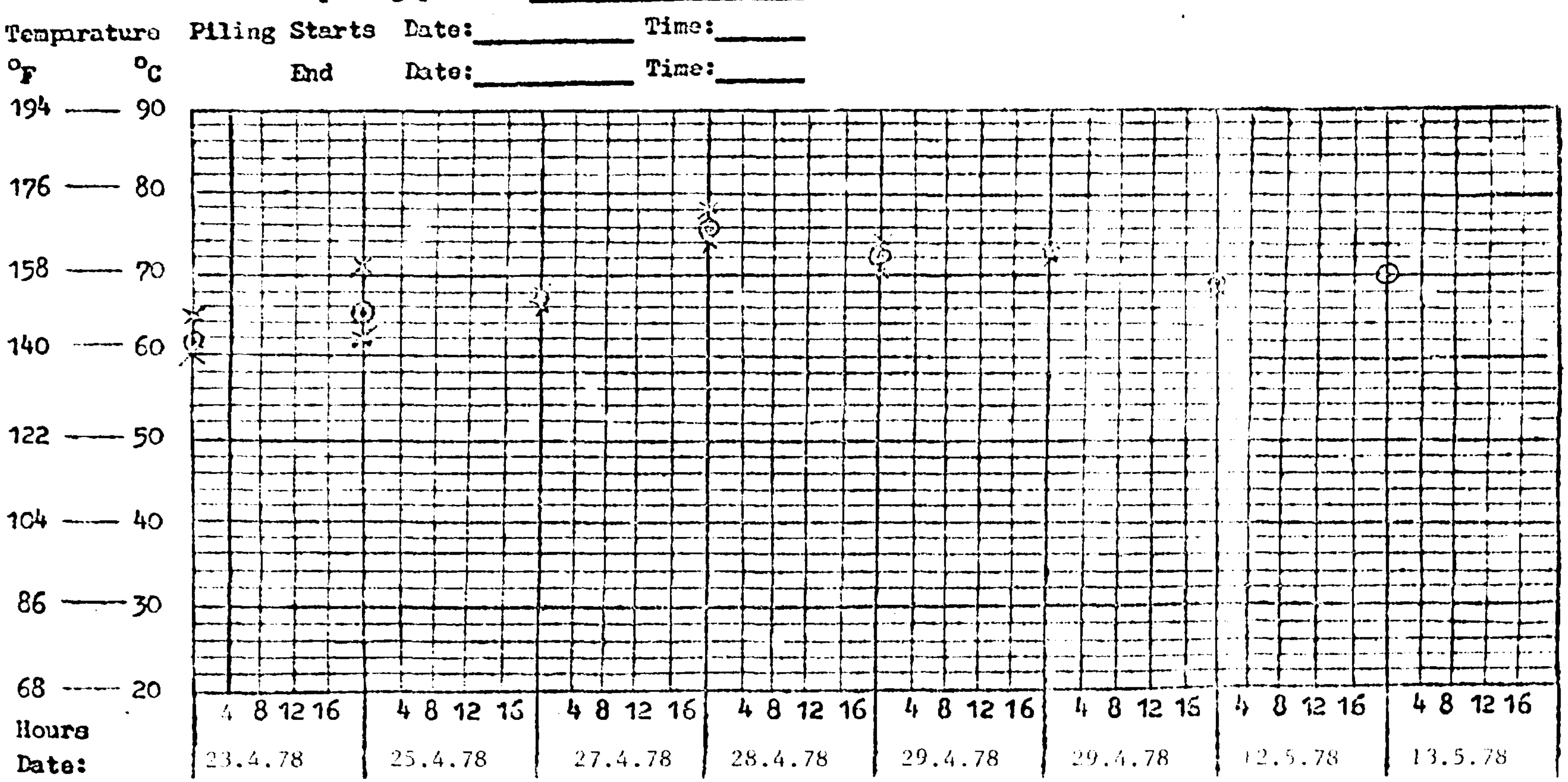
Bangladesh Jute Mills Corporation
UNDP/UNIDO Project No. BGD/73/043
QUALITY CONTROL

Name of the Mill: DACCA JUTE MILLS LTD.
Zone: 1

Temparature Checking During Piling opened

Quality of Jute 'Cutting'
Standard piling period:
Piling Starts Date: Time:
End Date: Time:

% of R.H.......Temp.......



QUALITY CONTROL OFFICER

ANNEX 10

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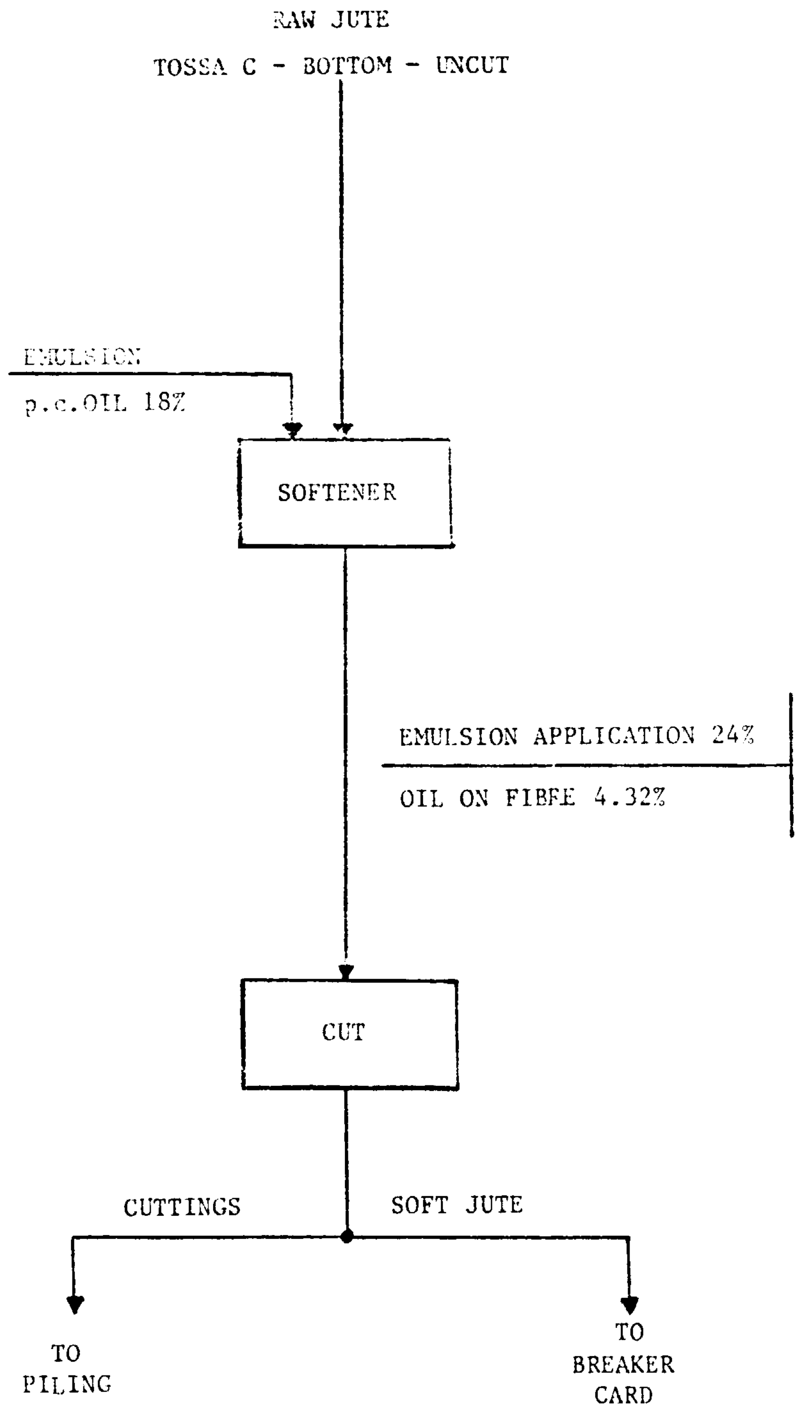
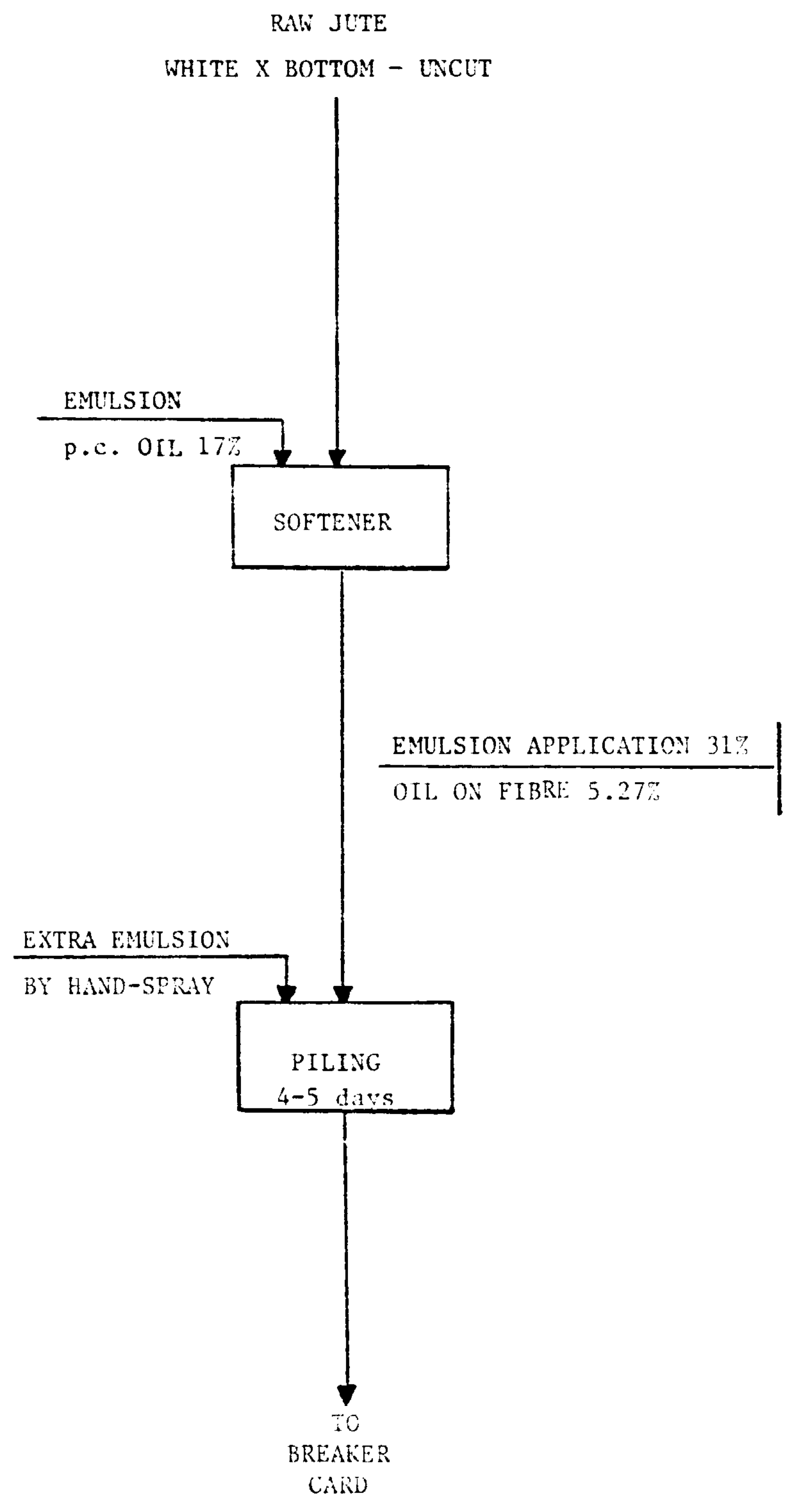
ANNEX II/A




RAW JUTE
WHITE X BOTTOM - UNCUT
EMULSION
p.c. OIL 17%
SOFTENER
EMULSION APPLICATION 31%
OIL ON FIBRE 5.27%
EXTRA EMULSION
BY HAND-SPRAY
PILING
4-5 days
TO
BREAKER
CARD

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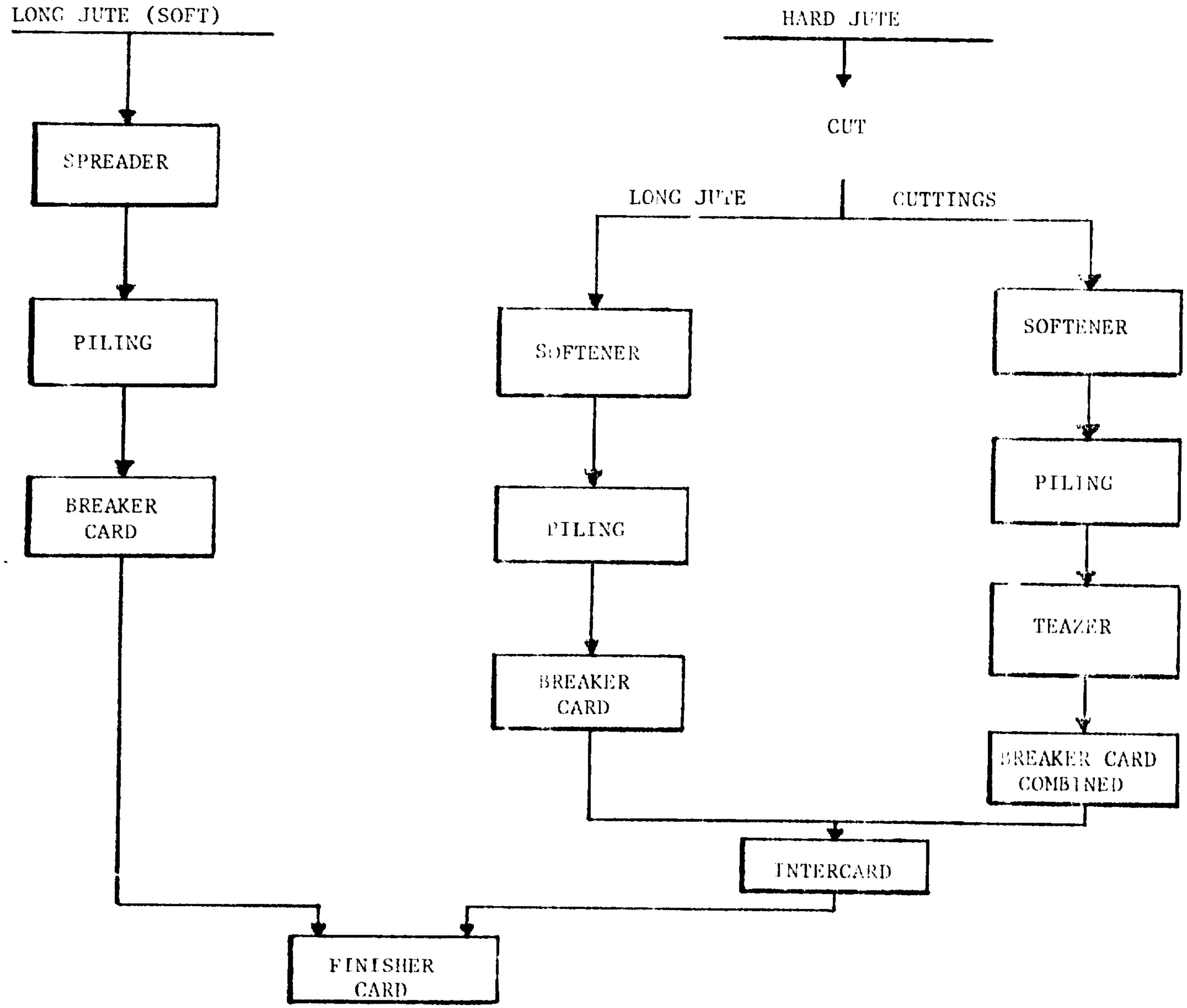
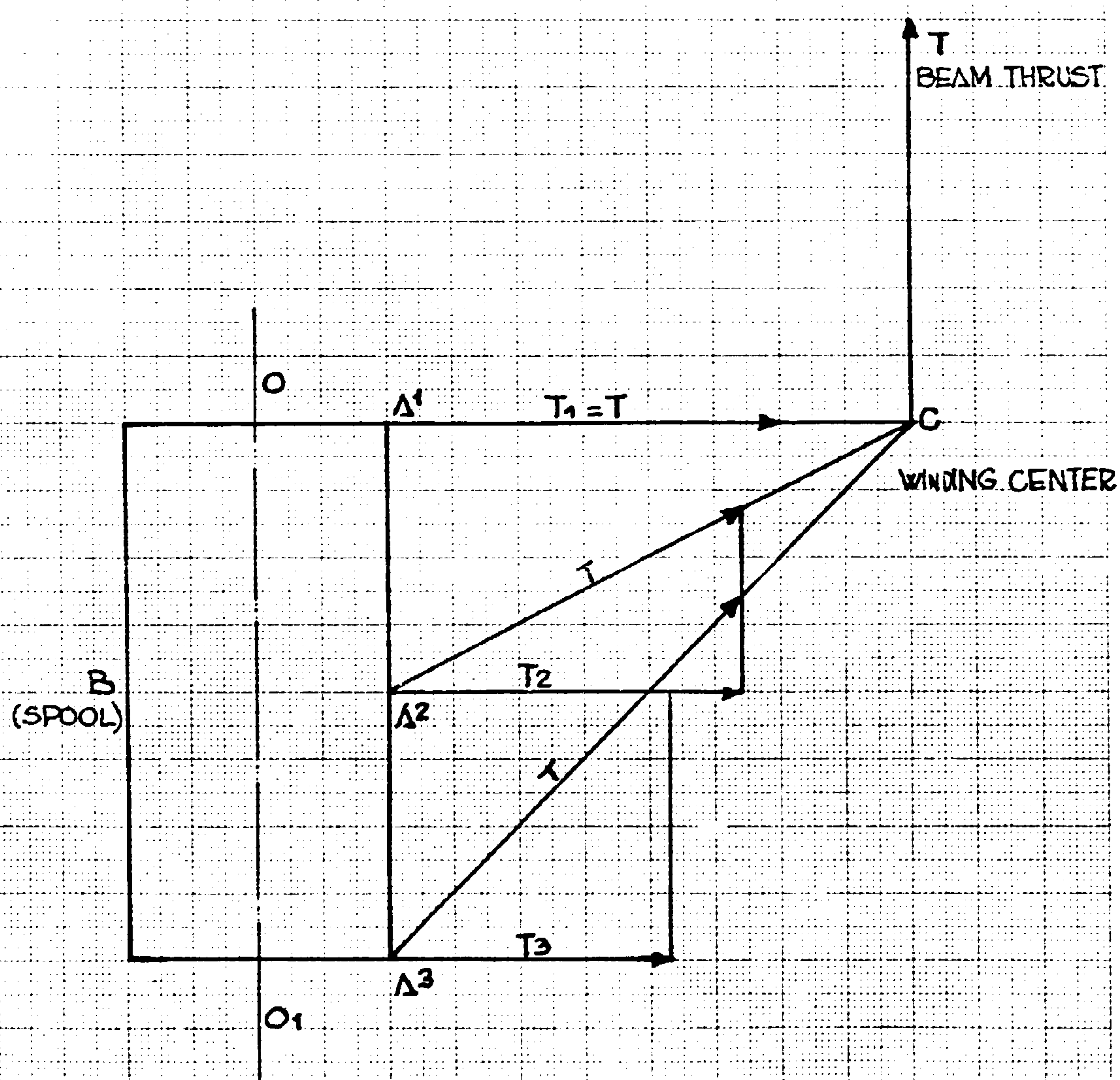
ANNEX 12

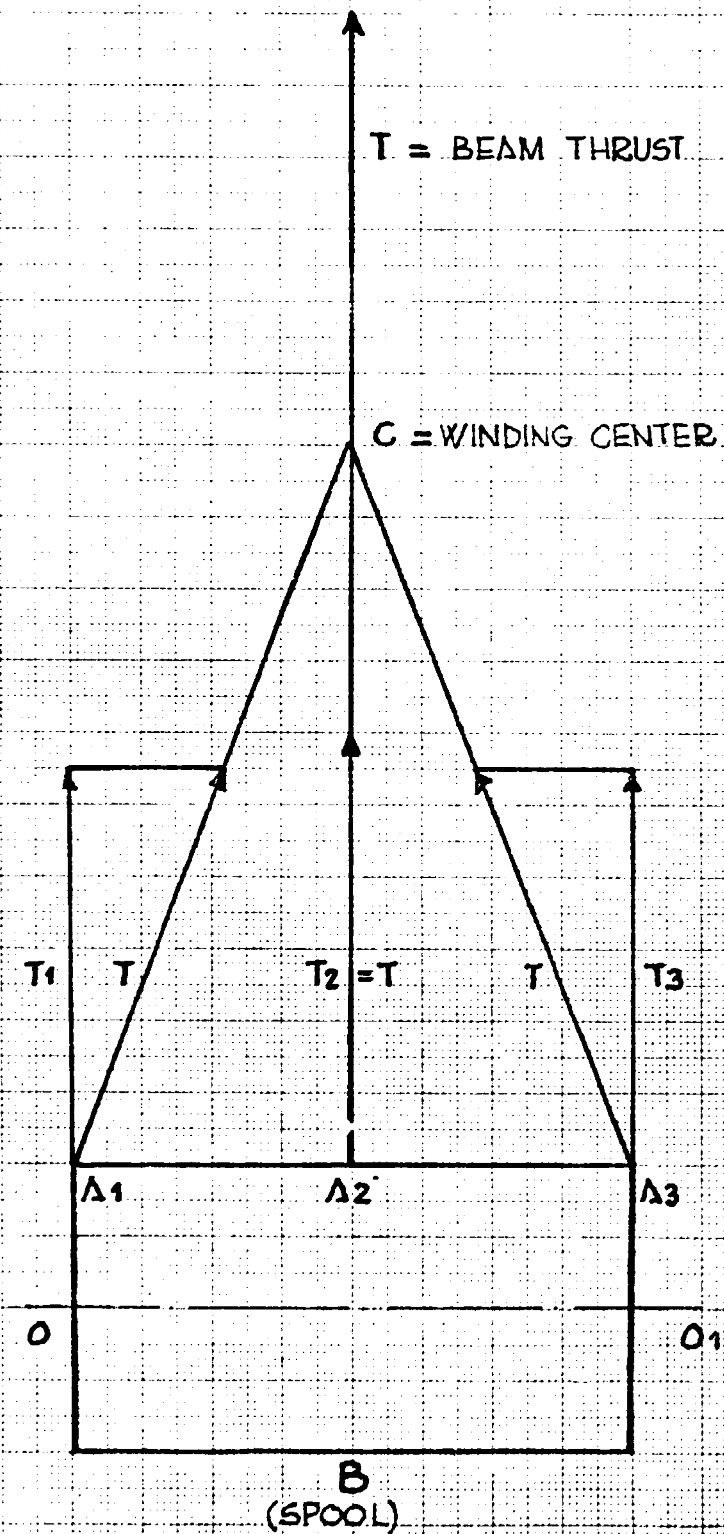


ANNEX 13



FABRICATION SUISSE

ANNEX 14



ANNEX IV

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REPORT

OF

PLATINUM JUTE MILLS

BY

UNDP/UNIDO PRODUCTIVITY TEAM

19th OCTOBER, 1979

borghi e baldo ingg.
s. p. a.

19.10.1979

REPORT ON PLATINUM JUTE MILLS.KHULNA

1. A) Morrah Weight: On the 30/8 and 31/8 the Team counterparts in Platinum Jute Mills carried out a series of individual tests.The results are shown in a concise way in Annex 1. where we can remark -

a) Only 7 workers, of the 15 checked, are able to select morrahs of average weight, inside the standard range (2- 2.5 lbs).

b) Only 46% of the total tests are inside the range on the 30th of August, but this percentage on the 31st of August is decreasing to about 33%.

c) The daily production of morrahs is restrained in anunbearable high range (2.75 lbs), that means 5.5 times the standard range(0.5 lbs).

d) CV(variation co-efficient) of each worker appears too high (maximum 25.33%). That will result in wide irregularity on softeners feeding, on oil application on fibre, on piling , on carding and ultimately on yarn production.

The Quality Control Department of the Mill is already running daily checking of the morrahs weights (Annex 2A-2B) which are showing similar results, as it is possible to deduce from our calculations and comments (see Annex 2C). Those checkings however have the defect to being made at random: therefore they do not allow to find out individual irregularities and to suggest practical action.

We would like to remember that our Team has already run practical training courses to the workers present in the Department. In the immediate period following the training, on 382 single checking the 65% was showing inside the standard range.

1. B) Productivity Team Proposals:

- We remind you that the Productivity Team, on the 20th of April produced a general Report on this particular problem,with specific proposals.
- We enclose copy of pages 4/5 of the above Report (see Annex 3) with our general proposals.

- Referring particularly to Platinum Jute Mills, we know that the problem of wages of the workers of the Department(Assorters) has already been solved. This problem was mentioned in our general Report(see point 5 of Annex 3A+B) and we are quite satisfied to have contributed, in some way, to its solving. We have been able to verify personally a wide availability on workers side to improve their work, if properly trained.

We suggest that :

a) the daily checking should be made not at random, but for individual workers by the Q.C Officer, jointly with the Officer in charge of the Batching Department.

b) at this control stage should follow the stage of training and correction of faults.

c) control and training should be particularly aimed to the new workers (or "badly").

2.A) EMULSION

Emulsion is prepared, utilising:

- Normal water
- J.B.O. normally supplied
- Nonidet P.40 and Lissapol, as emulsifiers

As for the emulsion plants, there are 4 Rapisonic Plants (3 of the old type and 1 of new type).

We would like to point out the situation of each of those elements:

- WATER : Normal water is utilised, picked-up from subsoil and cycled without any control about the degree of hardness, the PH etc.-
- JUTE BATCHING OIL: It is bought from the local market, either directly from the producer (BURMA EASTERN) either through Agencies (JAMUNA AGENCY). There is only a control about quantity , but there is no checking about oil characteristics, as viscosity, specific weight , PH, smell, colour, impurities presence, etc.

...../

- Emulsifiers : original products are utilised, but imported through agencies, so there is no absolute trust in the products purity.
- RAPISONIC PLANTS: the 4 Plants are from the same manufacturer and same type, but different by age and consequently in capacity: one of the old plant is completely idle, while the other 3 are running in turn.
- Emulsion is prepared as shown in the enclosed Annex 4A+B where are also exposed the calculations relative to the final proportions.
- The Q.C.Department is checking, in an uneven way :

  a) the stability period of time : in a correct way, by checking the period of time between the emulsion preparation and the looming out of water layer on the bottom of the sealed bottle.

  b) the emulsion decomposition percentage after 24 hours.
- From the Q.C.records, we could remark that :

  a) stability was showing up during the month of July to 2 hours and to 1½ hours in August, with some minimum figures of about 30 minutes in both months.

  b) the decomposition percentage after24 hours has been about 30% .
  In the Q.C.records there is no explanation about the above differences specially about the single cases which pointed out the minimal figures in stability.
- On our opinion, the stability time is too low and can not be acceptable.
- Without an emulsion stable for almost 24 hours, it is impossible to achieve an uniform application of oil on fibre.
- With a desired uniform application, a continuous lubricated coat will be found on the fibre, which will assure an uniform maturing process of jute during the piling and a good carding process, with pins combing the fibre without any tear. In fact a not stable emulsion will result in a bad oil distribution and in a showing of water on fibre. Water, having no lubricant power, will therefore cause a very bad carding process.

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- We would like to point out, in the meantime, that without a good quality J.B.O. it will be impossible to obtain, a stable and correct emulsion. The last supply of J.B.O. to Platinum Jute Mills shows poor quality characteristics as :
  - very dark colour
  - manifest smell of kerosene
  - presence of sediments

  The first two factors are suggesting a mingling with kerosene, i.e., with a distillate at lower temperature, resulting in a J.B.O. with characteristics, as specific gravity and viscosity, completely different from the normal ones.

  The presence of sediments is a sign of bad filtering , of use of dirty containers, etc. This factor is particularly harmful to the working process, since it prevents the making of a stable emulsion.

2. B) Productivity Team Proposals:

- The Productivity Team has already produced on the 3rd of May a general report on this subject, with different remarks and proposals.
- We enclose copy of page 10/11 of the Report (See Annex 5) with our general proposals.
- We enclose copy of Annex 9 and 10 of the same general Report (See Annex6A/6B) with the results of the tests run at Platinum Jute Mills.

  In particular, for Platinum Jute Mills, we recommend:

  A) the use of condensed water: tests run at Platinum , as in the other Pilot Mills, are clearly pointing out the increase on stability time of emulsion, using softened water. On our opinion, as it shows from Annex 5, this increase can be estimated in about 40% = this is already a remarkable achievement.

- However the problem of water is a bigger one that one normally could think about; its correct solution can affect all the process efficiency, therefore costs and economical budgets of the mills.

- We would like to point out that, as far as we know, none of the Jute Mills in Bangladesh is provided with a plant of water softening.
- All the boilers are fed with water from the subsoil or from the rivers; the same water is utilised for emulsion and starch making.
- No analysis of the water utilised in the mill is carried out, but in our opinion either the high grade of hardness or the impurities present are making the same not suitable for industrial purposes.
- This is particularly true for the Khulna Zone, well known for the low quality of its water.
- We would like to pointout that modern softening water plants (with 10 N EXCHANGE RESINS) are available at relatively low cost , with minimum cost of service and easy maintenance. The only foreseeable maintenance cost is the periodical replacement of the exhausted resins.
- On the other hand the Q.C.Lab. at least in the Pilot Mills , are already equipped with PH meters, that's why the foreseeable necessary costs are insignificant.
- To come to the point it is our opinion that equipping Platinum Jute Mill with a proportioned water softening plant, will be an investment cheap in cost but excellent in results.
- The main advantages should be :

  a) a better and more stable emulsion.

  b) a better starch (due to the increased solubility of different products in water)

  c) higher efficiency in the boilers, with reduced consumption of fuel.

  d) less maintenance for the boilers and the auxiliary plants.
- Finally , last but not least advantage, the mill could use condensed water at certain temperatures (say about 40^{0}C) for the final mixing with water at the metering units of the emulsion coming from Rapisonic Plants. In this way it will be possible to maintain high the stability time of emulsion til the moment of application and to apply to the fibre emulsion at about 40^{0}C,

increasing the penetration & starting in the meantime the piling process. This is particularly important for processing hard, low costing fibres as Mestha, cuttings, etc.

B) <u>Correct use of emulsifier :</u> as it shows from Annex 4, the final proportion of emulsifier is about 0.5%.

- This proportion is practically coinciding with the advice of the Rapisonic Plant manufacturer.
- Nevertheless the stability time period is very low (see cap.2A) and unacceptable.
- The habit of previously diluting the emulsifier with water is helping to lower the stability period. Therefore (as already stated in point 2 B- <u>Annex 5</u>) we recommend to use <u>undiluted emulsifier.</u>
- <u>In Annex 7/B</u> we are condensing our advice about the plant setting, the use and final proportion of emulsifier, the possibility of corrections.

Finally :- follow the manufacturer instructions
- use a good quality emulsifier, in the correct proportions
- the final proportion should be increased if the stability period is still too low.

C) <u>RAPISONIC PLANTS</u>

Two remarks should be made about those plants , the first on the mechanical condition and maintenance of the plants, the second on their total capacity and present exploitations:

1) We enclose reports on the mechanical conditions of Rapisonic Plants (<u>Annex 9/A-9/B</u>). Our comment is that the expenses involved, for restoring the 3 old plants and for maintaining in good efficiency the new plant, are very reasonable and in any case productives.

2) According to the manufacturer data, the actual total capacity of the plants is the following one:

1 "JB" Plant(New type) = 2700 lbs/h of emulsion at 50%

5 "J" Plants (old type)= 1350 lbs/hx3 = 4050 lbs/h of emulsion at 50%

Total capacity = 6750 lbs/h of emulsion at 50%, i.e.,0.5 x 6750 =3375 lbs/h of oil.

Assuming an average application of oil on fibre (for soft and hard jute) of 6.5%, it follows that,with the quantity of oil potentially available, it is possible to apply emulsion to :

$$\frac{\text{lbs } 3375}{0.065} = 51.923 \text{ lbs/h of raw jute}$$

That means :

$$\frac{\text{lbs } 51.923 \times 16 \text{ hours}}{2240} = 370 \text{ Tons daily of raw jute}$$

- The actual daily production in mill No.1 at Platinum Jute Mill is about 60 Tons by day.
- It follows that the total exploitation of the plants is: $\frac{60}{370} \times 100 = 16.2\%$.
- This final data leave apart the presence of an additional Rapisonic Plant (new Type)which is feeding the small unit of carpet Backing.
- It results that just one of the old plants, in proper maintenance condition, is quite sufficient for the mill needs.
- Our advice is , therefore;
  - complete restoring of all the 4 available plants
  - possibility to move to another mill(actually equipped with conventional oil plants) of 2 of the "J" Rapisonic Plants, leaving Platinum Jute Mills equipped with a new "JB" Rapisonic Plant and an old "J" R.Plant.
  - as Security device, put in operation a network with the R.Plant installed in the carpet Backing Mill. In this way all the foreseeable emergency situations will be faced.

3. A) EMULSION APPLICATION

In Platinum Jute Mills Ltd the emulsion is applied to the fibre as follows :

a) directly on the different machines (4 Spreaders + 5 Softeners).

b) by hand, before piling , through "hand spray-system"

c) sometimes through "dipping system", before feeding the fibre to the softeners.

- In connection with point (a) (working machines), the Team counterparts in the mill checked the flow-charts and carried out some application tests, on two Softeners and two Spreaders. The results are enclosed in the Annex 10/A, 10/B, 10/C, 10/D, 10/E, 10/F, 10/G, 10/H, 10/I, 10/J, 10/K and 10/L.

- In connection with point (b) (hand spray-system), tests have been carried out on the oil content in the different portions of the fibre, after piling.
The results are enclosed in Annex 11.

- In connection with point (c) (Dipping system) tests have been carried out on the emulsion application concerning only this working method. The results are enclosed in Annex 12A / 12B.

- Our remarks about all the above tests are the following ones:

1) the flux of emulsion and water from the metering units changes in a notable way from one machine to another under the same conditions of setting, and in different periods. Particularly uneven is the water flux, may be due to the fluctuations in the feed pressure.

2) the habit of working with a single feeder on the softeners and the incorrect relation between the fed jute, the speed of the machines and the emulsion flux results in a high waste of emulsion, with consequent financial losses.

3) it is confirmed that Spreaders, if correctly maintained, have practically no emulsion wastages.

4) Oil application on fibre is not given accordingly with the characteristics of the fibre itself :

4% for a Mestha is too low

5.93% for a Tossa is too high

5) Emulsion application through "hand spray-system",is not reaching the desired results : the oil percentage in the uncut roots is abundantly lower from the required one :

4.4% against the desired 8-9%.

6) In the "dipping system" the emulsion waste is preposterous :

47% on the fibre average :

If we think that only the rooted portion is "dipped", we can easily deduce that on the rooted parts the application exceed 100% :

7) With the "dipping system" all the softeners rollers are working humid and emulsified fibres, hampering the correct softening process and mechanically damaging the same machines.It is well known that softeners should work, for the first third of their total length,dry fibres.

8) "Hand spray system" and "dipping system" are manual working processes, where the results are depending considerably on the single worker, with consequent high irregularities.

9) In both the above system , very often is employed recovered emulsion, already completely broken, with many impurities and with oil content very variable.

10) Finally, is our opinion that the mechanical working processes are at little under control, while the manual ones are completely out of any control.

3.B) <u>PRODUCTIVITY TEAM PROPOSALS</u>

- On this particular subject, the Productivity Team produced a General Report dated 16.8.1979.

- We enclose copy of pages 6-7 (<u>see Annex 13</u>) of the same Report , with our general advice .

- Particularly, for Platinum Jute Mill, our advice is :

  1) utilize at most the Spreaders, therefore reducing the softeners employ-

     At present time, the mill is running:

     3 Spreaders at double shift

     5 Softeners at double shift

     While a fourth spreader is constantly idle.

     It is easy to prove (see Annex 14) that, with an efficiency only just acceptable,

     4 Spreaders at double shift
     3 Softeners at double shift (with double feeder).

     are quite sufficient to cover the daily production.

- The advantages of this processing way are :

  - improved regularity
  - less emulsion wastages
  - better emulsion application
  - better piling
  - higher productivity

  and therefore less costs.

- Practically speaking, on the softeners should be run through only Mesta, cuttings and eventually particularly hard fibres, while the Spreaders should be kept for all the other grades, of softer fibres.

- We should also remember that one Spreaders is up to feed 2 Breaker Cards-

  a) Platinum Jute Mill was equipped once with 8 rolls feeded Breakers Cards.

     Due to the fact that one Spreader lays always idle, 2 of the above Breaker cards have been modified to hand feeding.

     From every point of view, it should be advisable to :

     A) let run all the 4 spreaders

     B) reconvert the 2 modified Breaker cards to roll feeding

     C) organize correct maintaining, keeping in store- house a sufficient supply of spare parts.

2) Minimise, and abolish step by step, the manual system (as spray system and dripping system) which do not have any technical and production reason.
It is our opinion that roots in jute should be treated in a separate way, in such a manner as to give them :

- the correct oil percentage
- the correct period of piling
- the correct number of carding passages

3) Control the regularity of flakes from the metering units.

- The pipe cleaning should be periodical.
- The water pressure should be uniform as much as possible, therefore the tank should be at constant level.

4) Oil application proportional to the fibre quality, should be looked after with much more care-
we would like to recall the correct percentages :

Soft jute = 4.5%
Mestha, SMR, etc = 6-7%
Cuttings =9- 10%

4.A) PILING

On the basis of data supplied by the mill officers, the daily quantity of jute under piling is around about 290 Tons, against an actual average daily production in the spinning department of about 54 Tons. The rotating index is therefore :

$$\frac{290}{54} = 5.37$$

which seems quite satisfactory.
Nevertheless we could notice :

- at least one grade of jute is not put under piling (BWD for the batch of Sacking warp and Hessian weft).

- the number of spreader rolls under piling is very irregular, varying from a minimum of about 35 to a maximum of about 125.

- the temperatures reached by jute under piling are not checked with the due assiduousness : in particular there are very few collected data about temperatures of spreader rolls , of Mestha, and cuttings, that means of the lowest grades.

Since the rotating index on the whole is satisfactory, we can deduct, from the above remarks, that :

- some jute grades are put under piling by excess, in comparison to the requirements, or that the piling period time is longer as the correct one.

4.B) PRODUCTIVITY TEAM PROPOSALS:

- We should remember that an even maturing of all the jute grades is an essential condition for a correct carding process and therefore for a correct spinning efficiency.

- This is particularly true for the lower grades, more hard and woody.
- The rotating index is only a comparison: it should be formed by the total of the layings of the different qualities of jute processed, each for the respective quantity.

- Temperatures should be checked with more regularity, particularly for the fibres of the lower grades- a bad maturing of those fibres could compromise all the spinning process. This checking should be the duty of the mill officers, in strict co-operation with the Q.C. Department which will collect the data.

5.A) PROCESSING

- The Productivity Team has looked into the processing cycles applied, in Platinum Jute Mill, to the different grades of jute employed for the 4 main batches :

  - Hessian warp
  - Hessian weft
  - Sacking warp
  - Sacking weft

The different work cycles are enclosed in the Annexes 15*. We will consider the 4 different working cycles, one by one :

1) Hessian warp: we remark that :
- the final Batch is formed on the Breaker cards
- Mestha C, a Hard fibre, is processed through spreader and is introduced in the batch with only one passage on Breaker card.
- Tossa C Bottom, a softer fibre, is processed with 2 passages through softener and spreader and to this grade an extra application of emulsion is applied, before piling, through the "hand spray " operation.
- The spreader is used for (Tossa C Bottom) only to produce rolls, working on already emulsioned jute, therefore, humid and with oil addition : this system is quite harmful for all the gears, the pin tips and the chains of the machine, which should work dry jute, as by manufacturer design.

2) Hessian weft.
- Tossa X Bottom, white X Bottom, Mestha X Bottom are all processed in "uncut" form.
- To all the above grades an extra application of emulsion is applied, before piling, through the "hand-spray, operation.
- Tossa X Bottom and White X Bottom are processed through softeners, instead that on spreader.

3) Sacking warp:
- BWL, soft jute, is processed through softener and is not piled.
- White X Bottom, Tossa X Bottom and Mestha X are all processed in "uncut" form.
- To all the above grades an extra application of emulsion is applied, before piling, through the "hand-spray" operation.

* Annex 15A, 15B, 15C, 15D and 15E.

Contd......P/14.

- The three above grades are processed first through softener and then through spreader, which therefore is used only to produce rolls from already emulsioned jute.
- White X Bottom and Tossa X bottom are processed through softeners instead that on Spreader.
- Mestha X Bottom is processed with only one passage through a Breaker card before being put through Finisher card.

4) Sacking weft:

- the lower qualities, as Hubby/Jubby, cuttings and Ropes, are processed with 2 passages through Breaker cards, before being introduced in the final Batch.
- Mestha X Bottom is processed with only one carding on Breaker cards, before being introduced in the final Batch.
- Mestha X Bottom, Tossa and white RJ are all processed as "uncut" jute and to them is applied an extra application of emulsion, before piling, through the "hand-spray" operation.
- As general remark, it is our opinion that the different batches are not formed in the correct technical way and in a economical one.
- We should remember that incorrect processing cycles, bad exploitation of single machines, wrong emulsion application are all reasons for high irregularities, high wastages and low efficiency.
- The main impact for good efficiency and therefore for low costs is caused by a correct processing in the batching phase: this is specially to be applied to the lower grades of jute.

5(B) PRODUCTIVITY TEAM PROPOSALS:

- On the basis of all our remarks on point 5-A), our Team is suggesting the processing cycles, enclosed in the Annexes - 16A, 16B & 16C.
- The different cycles do not need further comments.

Contd.....P/15.

- On our opinion, the results will be :
  - correct processing for each type of fibre
  - correct use of machines
  - abolition of useless hand made operations
  - correct exploitation of the more productive single machines
- We are quite aware that the mill will not be in a position to apply all our advice simultaneously.
- We have drafted a programme, which should be gradually applied, starting from the more simple phases.
- The carrying out of this programme needs particularly a correct maintenance of some key-machines, as spreaders and Teasers : the mill management should take in proper account this problem.
- In the same time, the carrying out of the above programme could cause some problem in the machines load : One Team will be at disposal to help the mill management in the checkings for the different machines units loads.
- From mill side, should be regularly checked the efficiency of single machines and plants and the correctness of all the different processing phases. Only the correct and daily application from all the Mill Officers involved in the process will cause the success of the programme we have submitted to mill management attention.

6.(A) <u>VARIOUS PROBLEMS</u>:

A) <u>Beaming in Mill No.1</u>:

We have knowledge that once this mill was equipped with a modern section warping, formed by the following machines :

- Pre-beaming, with winding off with modern system
- dressing machine
- This warping unit has been dismantled some years ago, due to working difficulties as problems of proper maintenance of the single machines.

Contd....P/16.

- The above warping unit has been replaced by old type machines, for direct warping with winding with old rolling system.
- The newest type of machinery is standing idle in the worehouse.

B) Winding in mill No.2(Carpet Backing Unit):

- This mill is equipped with quite modern machinery, in particular with :

  Apron - draft Mackie spinning frames
  Mackie Winding machines of Mackroll Roll Winder type
  Mackie cops Winding machines of Mackcop Winder type.

- All the yarn coming from the spinning frames is wound into rolls, and afterwards a part is wound again from rolls to cops, as in the enclosed acheme (see Annex 17).
- With this type of scheme the work load of the rolls winding machines is almost the double from the normal one.
- The yarn bobbins are coming from the spinning frames without normal Tag-end, the rolls winding machine is fed by a single bobbin for each plate against the 3 possible ones. The working is therefore not regular, with a low efficiency.
- Almost all the stop-motions of the roll winding machines are not working.
- The cops winding machines are fed by a single roll for each plate

6(B) PRODUCTIVITY TEAM PROPOSALS:

A) Beaming in Mill No.1:

- We suggest the Mill Management to do every possible effort for reactivating the modern machines system.
- We are well aware that this type of machinery needs a higher and more expensive maintenance : nevertheless there is no possible comparison, in quantity and quality of production, with the same available to-day from the actual installed plant.

Contd....P/17.

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- We point out that a good warping is essential for high efficiency in the Weaving Department.

5) Winding in Mill No. 2(Carpet Backing Unit):

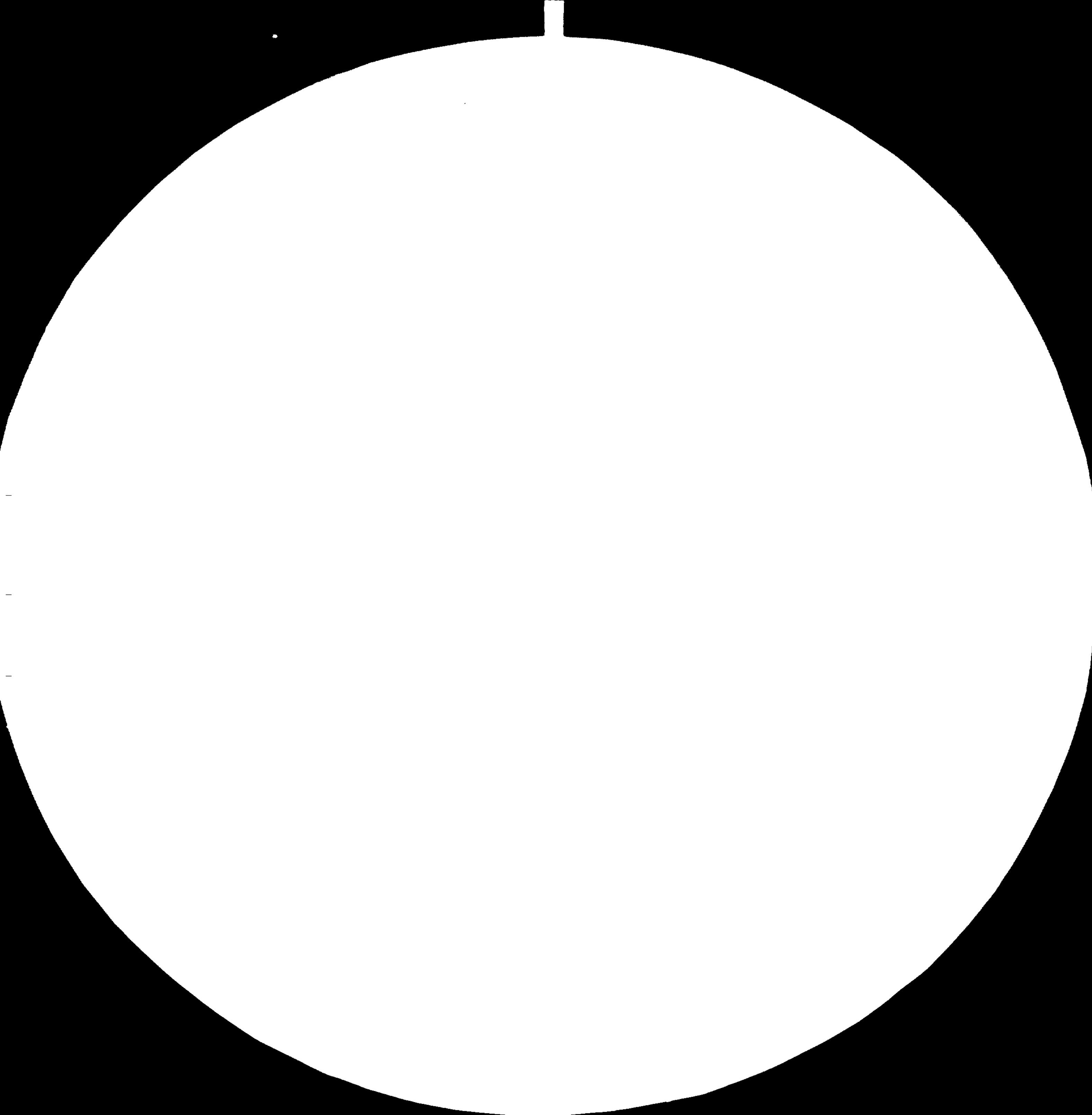
We suggest to the Mill Management to do his best to reactivate ;

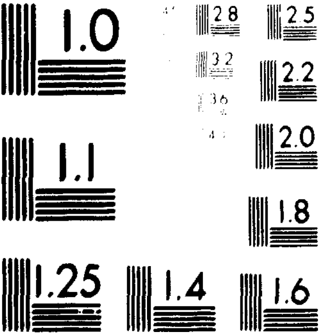
- tag-ending on spinning frames bobbins
- continuous feeding, with 3 bobbins at tag-end, of roll and cops winding machines.
- stop-motions on all the winding machines.

- The correct working cycle should be the enclosed one(see Annex 13).
- The production results will abundantly compensate the necessary expenses.
- The workers should be trained to work with the correct modern system.

FINAL COMMENT:

- The Productivity Team is quite aware of the interest and the co-operation shown by the Mill Management.
- The Productivity Team is also aware that the above advice requires better supervision, both for quality and for quantity, particularly for the first working steps of the process. We know that there are gaps in the staff, particularly for the first stages of the process.
- The Productivity Team is at the disposal of the Mill Management to supply all the possible help to overcome the problems arisen in the actual Report and those which will be submitted by the mill management itself.




1.0
2.8
2.5
3.2
2.2
3.6
2.0
1.1
1.8
1.25
1.4
1.6

PLATINUM REPORT

MORRAH TESTS

Date	Name	Quality	No.Tests	Highest lbs	Lowest lbs	Range lbs	Below Std	Whithin Std
30-8-79	A. Haque	BWD	15	3.5	1.5	2.0	2	8
30-8-79	Moslem Ali	BWD	15	3.0	1.5	1.5	6	8
30-8-79	M.Ibrahim	NC	15	3.0	1.5	1.5	4	10
30-8-79	M. Azhar	BWD	15	2.5	1.0	1.5	4	11
30-8-79	A. Kashem	BWD	23	2.25	1.0	1.25	12	11
30-8-79	A. Hasam	WXBOtt	15	3.0	2.0	1.0	-	13
30-8-79	A. Haque	WX BOTT	15	3.75	1.50	2.25	2	2
30-8-79	A. Rashid	BWD	15	3.00	1.25	1.75	4	10
30-8-79	Mohd. Ali	BWD	16	3.00	1.50	1.50	5	10
30-8-79	Aziz	BWD	16	2.25	1.25	1.00	9	7
TOTAL OF TESTS	/	/	160	3.75	1.0	2.75	48	90
31-8-79	Amir Ali	BWD	16	2.25	1.0	1.25	13	3
31-8-79	M. Ibrahim	WX BOTT	18	3.50	1.5	2.0	3	10
31-8-79	A. Hashem	BWD	15	3.75	1.75	2.0	1	6
31-8-79	Mr.Omar Sk	WX BOTT	15	3.75	2.0	1.75	-	4
31-8-79	A. Jabbar	WX BOTT	20	3.50	2.50	1.0	-	5
TOTAL OF TESTS	/	/	84	3.75	1.0	2.75	17	28

ANNEX 1

Above Std	Average lbs/morah	S.D.	C.V%
5	2.42	0.54	22.35
1	2.05	0.45	21.72
1	2.25	0.44	19.70
-	1.88	0.34	18.00
-	1.76	0.31	17.38
2	2.37	0.31	13.16
11	3.00	0.76	25.39
1	2.12	0.52	24.40
1	2.03	0.43	21.02
-	1.73	0.31	17.82
22	2.14	0.57	26.52
-	1.63	0.37	22.47
5	2.33	0.57	24.38
8	2.75	0.63	22.79
11	2.88	0.55	19.07
15	2.99	0.38	12.58
39	2.53	0.70	27.65

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s.p.a.

ANNEX 2 A

PLATINUM JUBILEE JUTE MILLS LTD
TOWN KHALISHPUR- KHULNA

Quality Control Department
Morah Test Report.

Mill No. 1 Date :- 28.8.79.

Quality. White -D Time :- 4-0 P M.

	Weight lbs	Weight lbs	Weight lbs	Weight lbs	Weight lbs
	2.5	1.5	2.5	3.0	3.0
	2.5	2.0	2.0	2.0	2.5
	3.5	2.5	1.5	2.5	3.5
	1.5	2.0	2.0	2.0	2.0
	1.5	1.5	3.0	2.0	2.0
Total	11.5	9.5	11.0	11.5	13.0
Average	2.3	1.9	2.2	2.3	2.6

Sd/- 31.8.79
QUALITY CONTROL OFFICER.

Copy to :-

1. General Manager
2. Production Manager
3. Sr.Asstt.
4. Sr.J.P O
5. Batching
6. Office Copy.

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s.p.a.

ANNEX 2 B

PLATINUM JUBILEE JUTE MILLS LTD.
TOWN KHALISHPUR - KHULNA

Mill No. 1
Quality White-L

Quality Control Department
Morah Test Report.

Dated: 29.8.79
Time : 4-0 P.M.

	Weight lbs	Weight lbs	Weight lbs	Weight lbs	Weight lbs
	3.0	3.0	1.5	1.5	2.0
	2.5	1.5	1.5	2.5	2.5
	2.5	2.0	1.5	3.0	3.0
	3.0	3.0	2.0	3.5	2.0
	2.5	3.5	2.0	3.0	2.5
Total	13.5	13.0	8.5	13.5	12.0
Average	2.7	2.6	1.7	2.7	2.40
Range	0.5	2.0	0.5	2.0	1.0

Sd/- 31.8.79
QUALITY CONTROL OFFICER:

Copy to:-

1. General Manager
2. Production Manager
3. Sr.Asstt.
4. Sr.J.P.O.
5. Batching
6. Office Copy.

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ANNEX 2C

PLATINUM REPORT

ANALYSIS ON MORRAH TESTS

Date	Sample	Quality	No. Tests	Highest lbs	Lowest lbs	Range lbs	Below Std	Whithin Std	Above Std	Average lbs/Morah	S.D.	C.V.%
28-8-79	RANDOM	BWD	5	3.5	1.5	2.0	2	2	1	2.3	0.84	36.38
28-8-79	RANDOM	BWD	5	2.5	1.5	1.0	2	3	-	1.9	0.42	22.02
28-8-79	RANDOM	BWD	5	3.0	1.5	1.5	1	3	1	2.2	0.57	25.91
28-8-79	RANDOM	BWD	5	3.0	2.0	1.0	-	4	1	2.3	0.45	19.44
28-8-79	RANDOM	BWD	5	3.5	2.0	1.5	-	3	2	2.6	0.65	25.07
TOTAL OF TESTS	/	/	25	3.5	1.5	2.0	5	15	5	2.26	0.60	26.43
29-8-79	RANDOM	BWD	5	3.0	2.5	0.5	-	3	2	2.7	0.27	10.14
29-8-79	RANDOM	BWD	5	3.5	1.5	2.0	1	1	3	2.6	0.82	31.60
29-8-79	RANDOM	BWD	5	2.0	1.5	0.5	3	2	-	1.7	0.27	16.11
29-8-79	RANDOM	BWD	5	3.5	1.5	2.0	1	1	3	2.7	0.76	28.08
29-8-79	RANDOM	BWD	5	3.0	2.0	1.0	-	4	1	2.4	0.42	17.43
TOTAL OF TESTS	/	/	25	3.5	1.5	2.0	5	11	9	2.42	0.64	26.46

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s. p. a.

ANNEX 3

PRODUCTIVITY TEAM PROPOSAL

1) Due to the concrete impossibility of a general daily control on all the workers involved, we suggest a random daily chedking .The workers who undergo the daily checking should be trained by the department Supervisors, with the same method employed by our Team.Consequently, there should be a daily rotation of the workers subject to control , so that in a certain time unit all the workers involved will be undergoing the training stage.

2) This control system should be assumed as normal routine in every mill organisation.

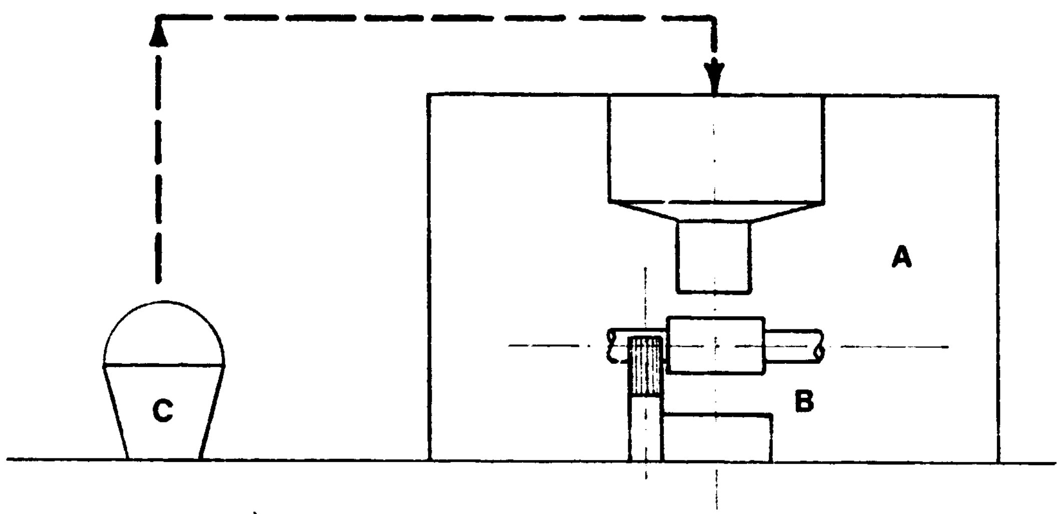
3) When the departments situation will show a certain regular trend, it is up to the mill production Officers to take in right consideration the problem of the ratio between the morrahs weight and the Moisture Regain of raw Jute.

4) Consequently to point 2, in every morrah preparing department there should be at least two scales.

5) We also recommend an unitary wages policy, so that all the workers of the department involved, regardless of mills and zone, will earn the same pay: this to avoid problems similar to those aroused in Platinum Jute Mills

EMULSION PREPARATION IN PLATINUM J.JUTE MILL

\- SCHEME -



A RAPISONIC PLANT **B** EMULSIFIER PUMP **C** BUCKET

BUCKET WITH 1.5 LISSAPOL + 2.0 WATER = TOTAL 3.5

PERCENTAGE OF EMULSIFIER IN THE BUCKET = $\frac{1.5}{3.5} \times 100 = 42.86\%$

SETTING OF EMULSIFIER PUMP = 1" CRANK THROW.

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s. p. a.

ANNEX 4B

PERCENTAGE CALCULATION

According to the Manufacturer Instructions with the Setting shown in Annex 4A the emulsifier Pump will deliver :

1 part of emulsifier for every 21 parts of oil

Since the Plant is delivering emulsion at a Fifty/Fifty rate say -

1 part oil

1 part water

the percentage of emulsifier in the emulsion delivered from the plant will be:

1 part emulsifier

21 part oil

21 part water

43 Total - Therefore : $\frac{1 \text{ part}}{43 \text{ parts}} = 2.33\%$

We must remember that before application, the emulsion will be mixed with water in the metering unit.

Normally also the mixing will be at a Fifty/Fifty rate,then the final percentage of emulsifier in the emulsion at the delivery side will be :

1 part emulsifier

21 part oil

21 part water

43 part water

86 part Total

Therefore the final percentage will be :

$$\frac{1 \text{ part}}{86 \text{ part}} = 1.16\%$$

Since the emulsifier is already mixed with water, the correct percentage will be :

$$\frac{42.86}{100} \times \frac{1.16}{100} \times 100 = 0.4983\%$$

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ANNEX 5

FINAL ADVICE

(1) Our first advice is to send an explicative Circular to all the Mills involved on the Project, Circular which will assert once and for all the stablity concept and the manner to detect the same in simple and empirical way (see page 2 of General Notes).

(2) All new products employed should be previously tested on quality basis (See Page 4 of General Notes).

(3) The supply of Jute Batching Oil and emulsifiers should be made in a Centralized way by BJMC, with consequent reduction of costs, and time supply and more safety on the quality of products supplied.

(4) Standard characteristics of Jute Batching Oil for Bangladesh should be worked out (See Page 5 of Report).

(5) General advice should be given to all the mills to use condensed water : mechanical officers in each mill are quite able to study, for each mill, the possibility to draw pipelines from dressing department to emulsion Plants. Cost for this work appears trifling in ratio to results which can be achieved.

(6) Emulsifiers employed could be various, the important thing is they should be well known ones and original (i.e. imported ones or if bought on local market of good quality). Percentages of employ can vary accordingly, the main problem is to take advice from Company maker : those percentages should be changed only after results taken from Tests, which should be carried out by a Technical Institute (see our proposal on page 6 of Report).

Normal percentages are 0.5% for Rapisonic Plant and 1% for Conventional Plants.

(7) Temperature control during composition of emulsion should become normal routine for mill staff in charge.

(8) For Rapisonic Plants, it should be strongly recommended not to dilute previously the emulsifier in water : this will affect its chemical composition with the result of a lower impact in the emulsifier action. Moreover, for this type of Plant, which implies a % of employ of emulsifier lower that conventional plants, a correct mechanical control should be carried out as normal routine of mill maintenance : the cost for replacing spare parts on those plants is absolutely not comparative with the results which can be obtained by a proper working condition of the same Plants.

(9) For Conventional Old Plants, it should be recommended to control the right position of blades in the principal Tank to avoid the possibility a vacuum between the bottom of the tank and the first blade, vacuum which possibly could be filled with emulsifier (first agent to be put in Tank) which therefore will not be affected by the rotating movement of blades during emulsion composition process.

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ANNEX 6A

EMULSION BREAKING TEST REPORT

Name of Mills : PLATINUM JUTE MILLS

Type of Emulsi-fier: Plant RAPISONIC

Name of Emulsi-fier used : NIKANOL 910 with normal water.

% of Emulsifier	Time taken for first breakage (in minute)	% DECOMPOSITION					
		After 4 hours	After 8 hours	After 12 hours	After 16 hours	After 20 hours	After 24 hours
0.25	72	6	15	16.5	18	20	22
0.375	96	4/5	12	14	16	17	18
0.50	130	2	8	10	12	13	14

ANNEX 6B

EMULSION BREAKING TEST REPORT

Name of Mills : PLATINUM

Type of Emulsion Plant : RAPISONIC

Name of Emulsifier used : (Pure Emulsifier) NIKANOL 910 with condensed water.

% of Emulsifier	Time taken for first Breakage (in minute)	% DECOMPOSITION					
		After 4 hours	After 8 hours	After 12 hours	After 16 hours	After 20 hours	After 24 hours
0.25	135	35	10	13	16	17	13
0.375	192	2	8	10	12	13	14
0.50	260	/	6	7	8	9	10

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s.p.a.

ANNEX 7

SECTION 2

SETTING INSTRUCTIONS

The plant is designed to make emulsion of 50% by weight oil in water. Small adjustments to the pump strokes are provided to allow for variations in the density of the oil. See Test Procedure, page 6.

WATER TANK

The ball valve in the water tank is fitted with a 1/2" (12.7 mm) dia.seat. If the mains water pressure is so high that the valve fails to seal, substitute the 3/8" (9.525 mm) dia. seat supplied within the spares.

EMULSIFIER PUMP

With synthetic non-ionic emulsifiers the proportion required is approximately 1 part of emulsifier to 50 parts of oil. Set the crank pin at .375 ins. (9.525 mm) throw for initial trial.

If the emulsion is unstable INCREASE the proportion of emulsifier till a stable emulsion results.

With soap-type emulsifiers the proportion is approximately 1 part emulsifier to 25 part of oil. Set the crank pin at .875 ins. (22.225 mm) throw.

Two crank plates for the emulsifier pump are supplied with each plant for setting the correct proportion of emulsifier according to its individual properties.

Oil pump nominally 2" (50.8 mm) dia. x 2" (50.8 mm) stroke Stroke Volume = 6.28 cu. ins. (102910.36 cu.mm)								
Emulsifier Pump Dia. 0.4363" (11.082 mm) 0.4355" (11.062 mm)								
Crank Throw		Stroke		Stroke Vol.		Ratio Oil/ Emulsifier	Crank	Plates
ins.	mm	ins.	mm	cu.ins.	cu. mm		Std 910-03333-00	Inter 910-03334-00
.25	6.35	.5	12.7	.0750	1229.025	84: 1		
.375	9.525	.75	19.05	.1128	1848.454	56: 1		
.50	12.7	1.00	25.4	.1503	2462.966	42: 1		
.625	15.875	1.25	31.75	.1879	3079.117	33: 1		
.75	19.05	1.5	38.1	.2255	3695.269	28: 1		
.875	22.225	1.75	44.45	.2631	4311.420	24: 1		
1.00	25.4	2.00	50.8	.3007	4927.571	21: 1		

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ANNEX 8

EXAMPLES OF CALCULATION

Because proprietary emulsifiers contain a high proportion of water and because of the small quantity used, it may be neglected for the purpose of setting the proportions of oil and water.

Example 1

Water Pump Stroke	=	1.92" (48.77 mm)
Oil Pump Stroke	=	2" (50.8 mm)
Weight of Water	=	10 lbs (4.54 kilogrammes)
Weight of Oil	=	9.8 lbs (4.445 Kilogrammes)

The oil and water should be equal. Since the water pump has a greater variation in stroke reduce the water stroke in proportion.

Water Stroke requires $= 1.92 \times \frac{9.8}{10} = 1.88"$ (47.75 mm)

Example 2

Water Pump Stroke	=	1.92" (48.77 mm)
Oil Pump Stroke	=	2" (50.8 mm)
Weight of Water	=	10 lbs (4.54 kg)
Weight of Oil	=	9.85 lbs (4.47 kg)

Reducing water stroke, we get,

Required Water Stroke $= 1.92 \times \frac{9.85}{10} = 1.87"$ (47.5 mm)

It can be seen this lies between the available strokes on the water crank plate.

Choose 1.88" (47.75 mm) stroke.

This would deliver $\frac{1.88}{1.92} \times 10 = 9.79$ lbs. (4.441 kg) of water

now reducing the oil we get

Required Stroke $= 2 \times \frac{9.79}{9.85} = 1.98"$ (50.29 mm)

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ANNEX 9A

Since 1958, Platinum Jubilee Jute Mills was equipped with three Old 'J' Type Repasonic emulsion plant, made by M/s.Fraser. But these 3 Plants were not enough to fulfill full demand of mill as production of said plants were low. Moreover, maintenance,operational and spares cost of above plants were abnormally high.

Considering above factors, mill management decided to provide another new "JB" Type Repasonic Plant made by Fraser and installed in P.J.J.M. in 1967. Since then only one new Plant is enough to meet full demand.

Present Position:

To meet emergency requirement of mill during any break down of present running plant, It is decided by the management to put into operation all three Old "J" Type Plant which were idle since long.Out of three Old 'J' Type Plant, 2(two) were put into operation with following modification in 1978 :-

(1) Original gear box of all the old Plants (M/C.No.PR-539 and PR-541 & 540)has been dismantled due to non-availability of Spares.One P.I.V.gear box having three separate speed of Pre-beaming M/C. have been fitted out side the Plant. The P.I.V.gear is again coupled directly with Electric Motor. The power transmission of P.I.V. gear box and Emulsion pump has been connected by a Shaft (The Homogyner unit of plant is only connected with original. Main pump motor & extra fitted motor gives feed to water, Oil and Emulsifier unit).

(2) Both the old plant now running have been again interlinked with a Shaft. By extending the Shaft 3rd idle plant can also be put into operation, that is three Plants can run with one P.I.V. gear box and Motor.

(3) To put the third idle plant (M/C.No.PR-540) into operation,following modification and spares are necessary :-

   (a) One set of Piston and Piston Ring.
   (b) Some Brass Pinions which can be manufactured locally.
   (c) Dely. Pump of the Plant needs some repair may be done locally.
   (d) Some oil seals (imported item) is to be changed.
   (e) Complete over hauling is necessary to put into operation as it is remained idle for a long period.
   (f) If individual drive is necessary, one extra electric motor and P.I.V. gear box is necessary. (If P.I.V.gear box is not available, Pully or extra gear system may be arranged for speed changing system which can be manufacture locally).

ANNEX 9/B

However, following are the general mechanical condition of "JB" Type plant

b)Position of Bearings & Bushes :- Good, but seal bearings are found in bad condition.

b)Condition of Pumps :- Reasonable, but Mech.Seat etc. need replacement.

c)Condition of Homogeniser Vibrator blade :- Good.

d)Condition of valves :- Reasonable, but needs care and calibrizing.

e)General condition of Filters :- Not good, needs immediate replacement.

f)Gear position :- Worn Wheel condition is not good.

g)Piston condition :- Piston of water supply side is not good, needs replacemer

h(i) Cleaning of filters and tubs is good.

(ii) Cleaning of supply line and delivery line is not so good.

(iii) General cleaning is reasonable.

i) Lubrication of Plant :-

(i) Gear oil - The Plant needs immediate replacement of gear oil.

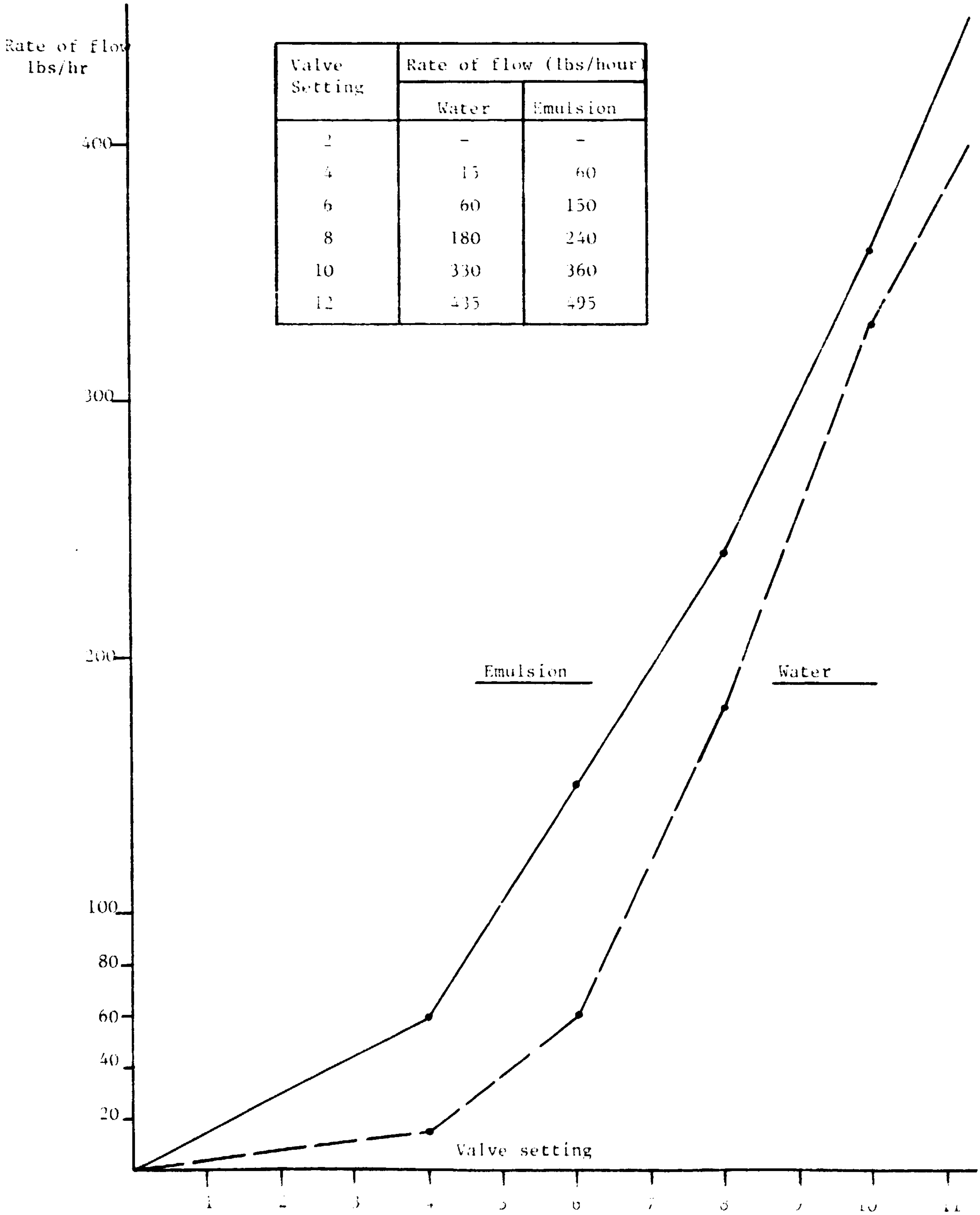
(ii) Pump lubrication - reasonable, but care should be taken so that leve of oil can be maintained.

(iii)General Lubrication is reasonable.

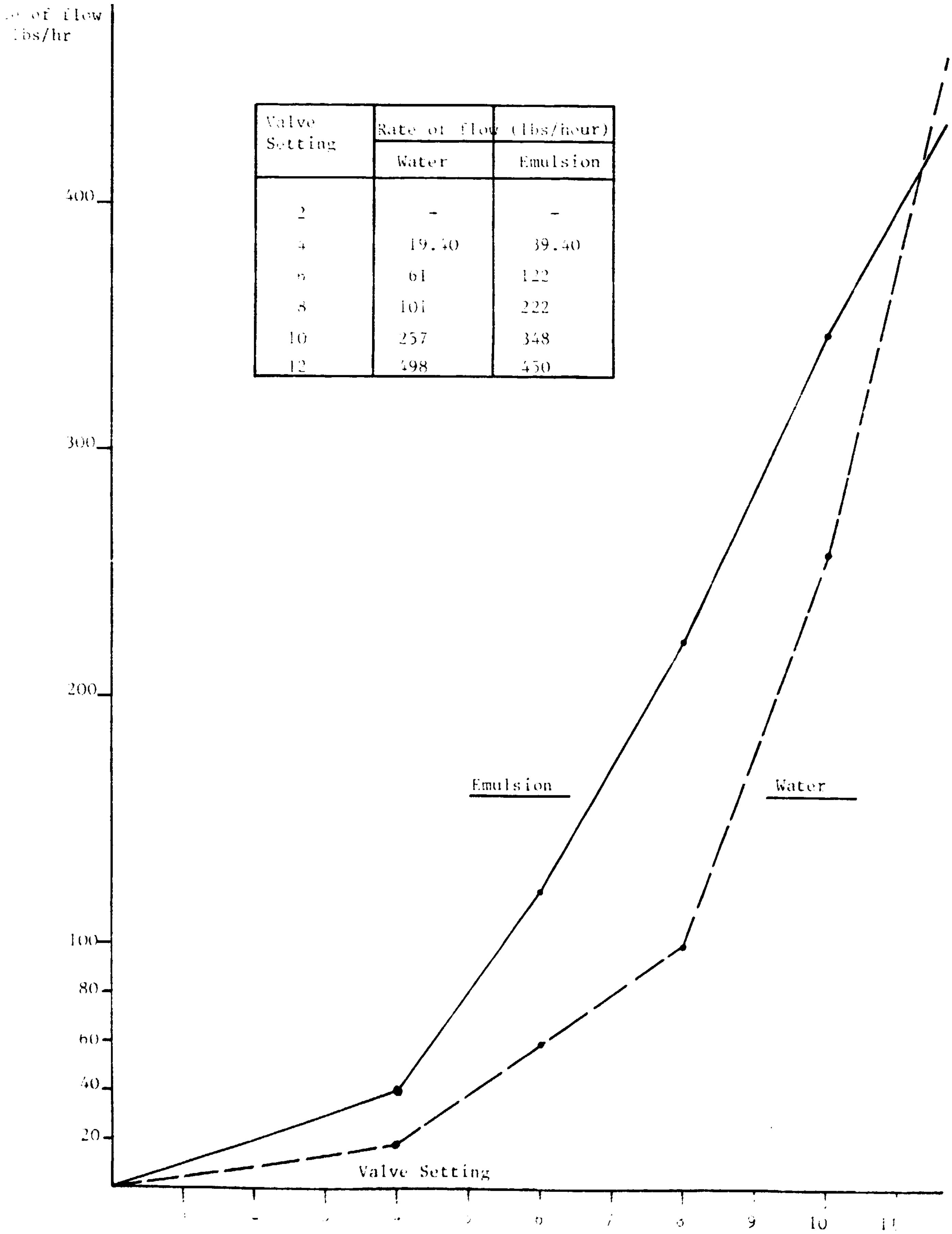
j) Micro switch of floating valve condition - Reasonable.

SPREADER No. 1 ANNEX 10/A

Valve Setting	Rate of flow (lbs/hour)	
	Water	Emulsion
2	-	-
4	15	60
6	60	150
8	180	240
10	330	360
12	435	495

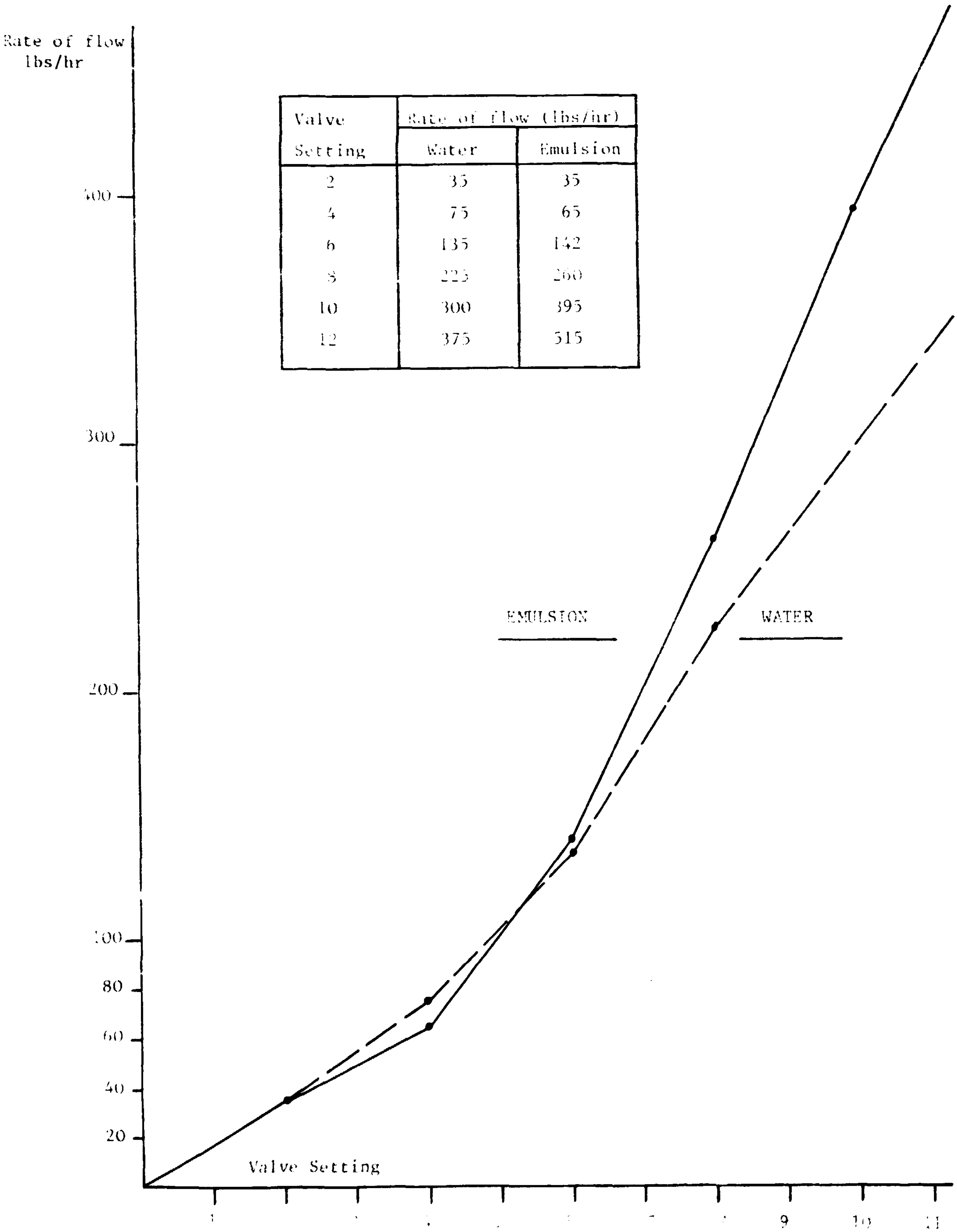


Valve Setting	Rate of flow (lbs/hour)	
	Water	Emulsion
2	-	-
4	19.40	39.40
6	61	122
8	101	222
10	257	348
12	498	450



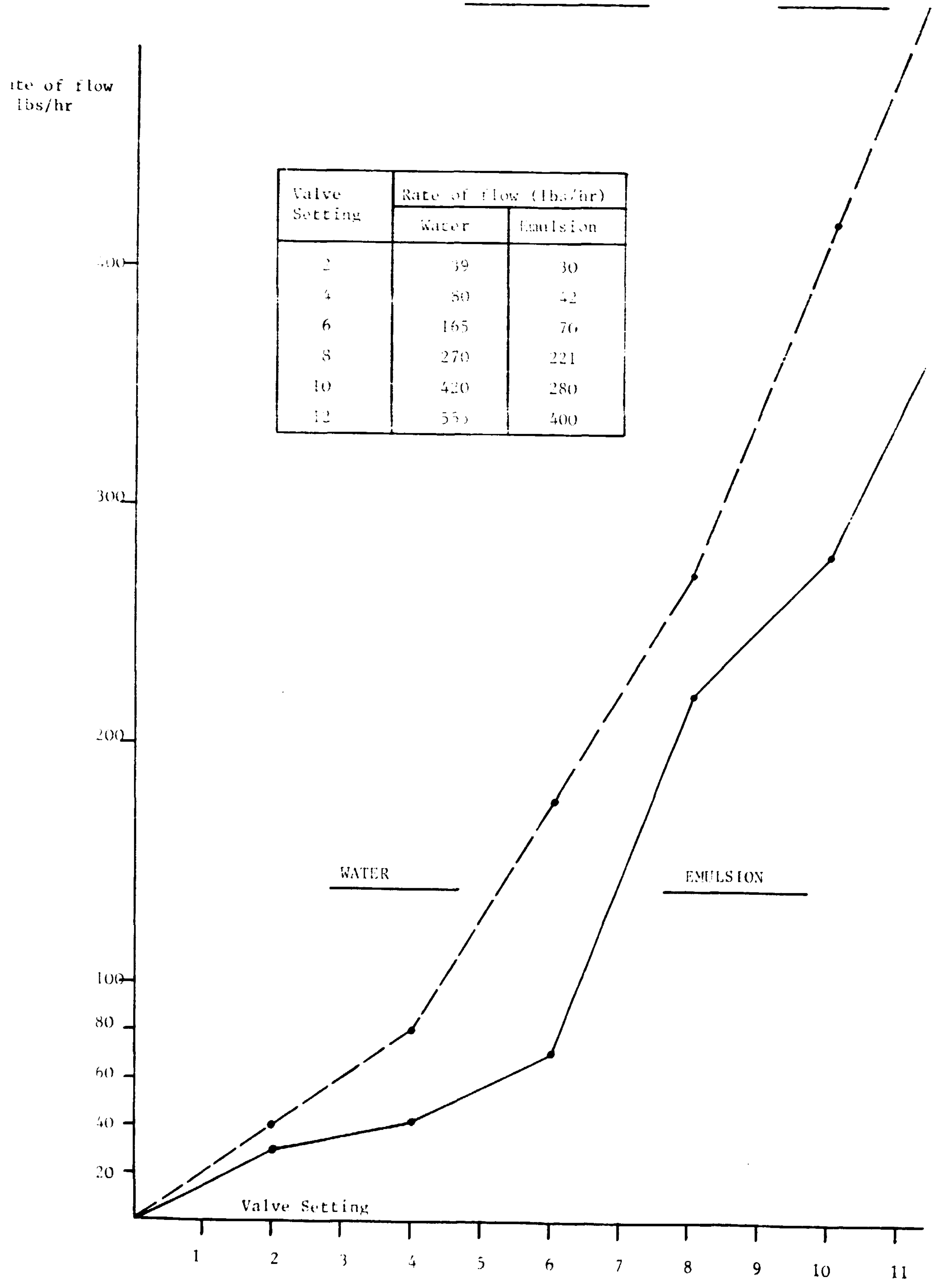
SOFTENER No.2

Valve Setting	Rate of flow (lbs/hr)	
	Water	Emulsion
2	35	35
4	75	65
6	135	142
8	225	260
10	300	395
12	375	515



SOFTENER NO. 3

ANNEX 10/D



Valve Setting	Rate of flow (lbs/hr)	
	Water	Emulsion
2	39	30
4	80	42
6	165	76
8	270	221
10	420	280
12	555	400

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s.p.a.

ANNEX. 10/E

EMULSION APPLICATION TEST

Date 11.2.1979

Machine : Spreader No.1

Machine Starting Time : 10. 10 A.M/
" Stopped at : 12. 10 P.M.
Quality : Mestha C Cut

Valve Setting | Water - 10
| Emulsion - 7

FLOW RATE Emulsion 195 lbs/hour
Water 330 "
Total .. 525 "

Oil percentage in Emulsion : $\frac{195}{2 \times 525} \times 100 =$
$= 18.57\%$

Actual Raw Jute fed - 3491 lbs.

Actual delivery - 4366 lbs (Jute + emulsion)

Applied emulsion - 875 lbs.

% of emulsion applied - $\frac{875}{3491} \times 100 = 25.06\%$

% of oil applied on the fibre - 18.57% x 25.06% = 4.65%

Production lbs/hour - 2183 lbs/hour

Delivery speed of the machine - 70 yards/minute

Sliver weight - 60 lbs/100 yards

Efficiency - $\frac{2183}{70 \times 0.6 \times 60} \times 100 = 86.5\%$

Counterparts -
Mr. Kamaluddin Ahmed
Mr. A.S.M. Abul Basher

borghi e baldo ingg.
s.p.a.

ANNEX 10/F

EMULSION APPLICATION TEST

Machine : Spreader No.2
" Started at 2.00 P.M.
" Stopped at 4.00 P.M.

Quality : Tossa B Cut

Valve Setting | Water - 10
Emulsion- 7

FLOW RATE

Emulsion	183	lbs/hour
Water	257	"
Total ..	440	

Oil percentage in Emulsion : $\frac{183}{2 \times 440} \times 100$
$= 20.8\%$

Actual Raw Jute fed - 3129 lbs.

Actual delivery - 4021.5 lbs (Jute + emulsion)

Emulsion applied - 892.5 lbs.

% of emulsion applied - $\frac{892.5}{3129} \times 100 = 28.5\%$

% of oil applied on the fibre. - $\frac{28.5 \times 20.8}{100} \times 100 = 5.93\%$

Production lbs/hour - 2010.75 lbs/hour

Delivery speed of the machines - 70 yards/minute

Sliver weight - 60 lbs/100 yards.

Efficiency - $\frac{2010.75}{70 \times 0.6 \times 60} \times 100 = 80\%$

Counterparts -

Mr.Kamaluddin Ahmed

Mr.Abul Basher

borghi e baldo ingg.
s.p.a.

ANNEX 10/G

EMULSION APPLICATION TEST

Machine : Softener No. 2 — Date: 8.2.1979

Machine Starting Time 10.45 A.M.

" Stopped at 12.45 P.M.

Quality : White X Bottom

Valve Setting | Water 7
Valve Setting | Emulsion 6

FLOW RATE			
	Emulsion	142	lbs/hour
	Water	178	"
	Total	320	"

Oil percentage in Emulsion :

$$\frac{142}{2 \times 320} \times 100 = 22.19\%$$

Actual Raw Jute fed	-	1776 lbs.
Actual Delivery	-	2074 lbs.(Jute + Emulsion)
Emulsion applied	-	298 lbs.
% of emulsion applied	-	$\frac{298}{1776} \times 100 = 16.77\%$
% of oil applied on the fibre.	-	$\frac{22.19 \times 16.77}{100} = 3.76\%$
Production lbs/hour	-	1037 lbs/hour
Normal delivery speed of the machine	-	19.69 yds/minute
Normal feeding speed of the machine	-	18.32 yards/minute
Average Morrah fed	-	$\frac{1776}{2 \times 60 \times 2.25}$ x 6.5 morrah/minute.
Average Length fed	-	6.5 x 1.67 = 10.85 yards/minute
Average gap between the Morrahs	-	$1 - \frac{10.85}{18.32} = 1 - 0.59 = 0.41 = 41\%$

Counterparts -

Mr.Kamaluddin Ahmed

Mr. Abul Basher

borghi e baldo ingg.
s.p.a.

ANNEX 10/H

EMULSION APPLICATION TEST

Machine : Softener No. 3

Machine Starting Time : 11.30 A.M.

" Stopped at 1.30 P.M.

Valve Setting | Water 8 | Emulsion 7

Quality : Mestha X Bottom

FLOW RATE
Emulsion 150 lbs/hour
Water 270 "
Total: 420 "

Oil percentage in Emulsion : $\frac{150}{2 \times 270} \times 100 = 17.86\%$

Actual Raw Jute fed	-	1716 lbs.
Actual Delivery	-	2100 lbs
Emulsion applied	-	384 lbs
% of emulsion applied	-	$\frac{384}{1716} \times 100 = 22.37\%$
% of oil applied on the fibre	-	$\frac{17.86 \times 22.37}{100} = 4\%$
Production lbs/hour	-	1050 lbs/hour
Normal delivery speed of the machine	-	19.69 yards/minute
Normal feeding speed of the machine	-	18.32 yards/minute
Average Morrah fed	-	$\frac{1716}{2 \times 60 \times 2.25} = 6.58$ morrah/minute
Average Length fed	-	$6.58 \times 1.67 = 11$ yards/minute
Average gap between the morrahs	-	$1 - \frac{11}{18.32} = 1 - 0.6 = 0.4 = 40\%$

N.B.
The above machine was idle for
4 minutes due to mechanical trouble

Counterparts -

Mr. Kamaluddin Ahmed

Mr. Abdul Basher

borghi e baldo ingg.
s. p. a.

ANNEX 10/I

EMULSION APPLICATION TEST

SPREADER NO. I

RAW JUTE: MESTHA C (CUT)

EMULSION

EMULSION APPLICATION
BALANCE

Raw Jute emulsified:
2183 lbs/hour

EMULSION WASTAGE
87.5 lbs/hour = 16.67%

Jute 1745.5 lbs/h
Emulsion 437.5 "

Application
25.06%

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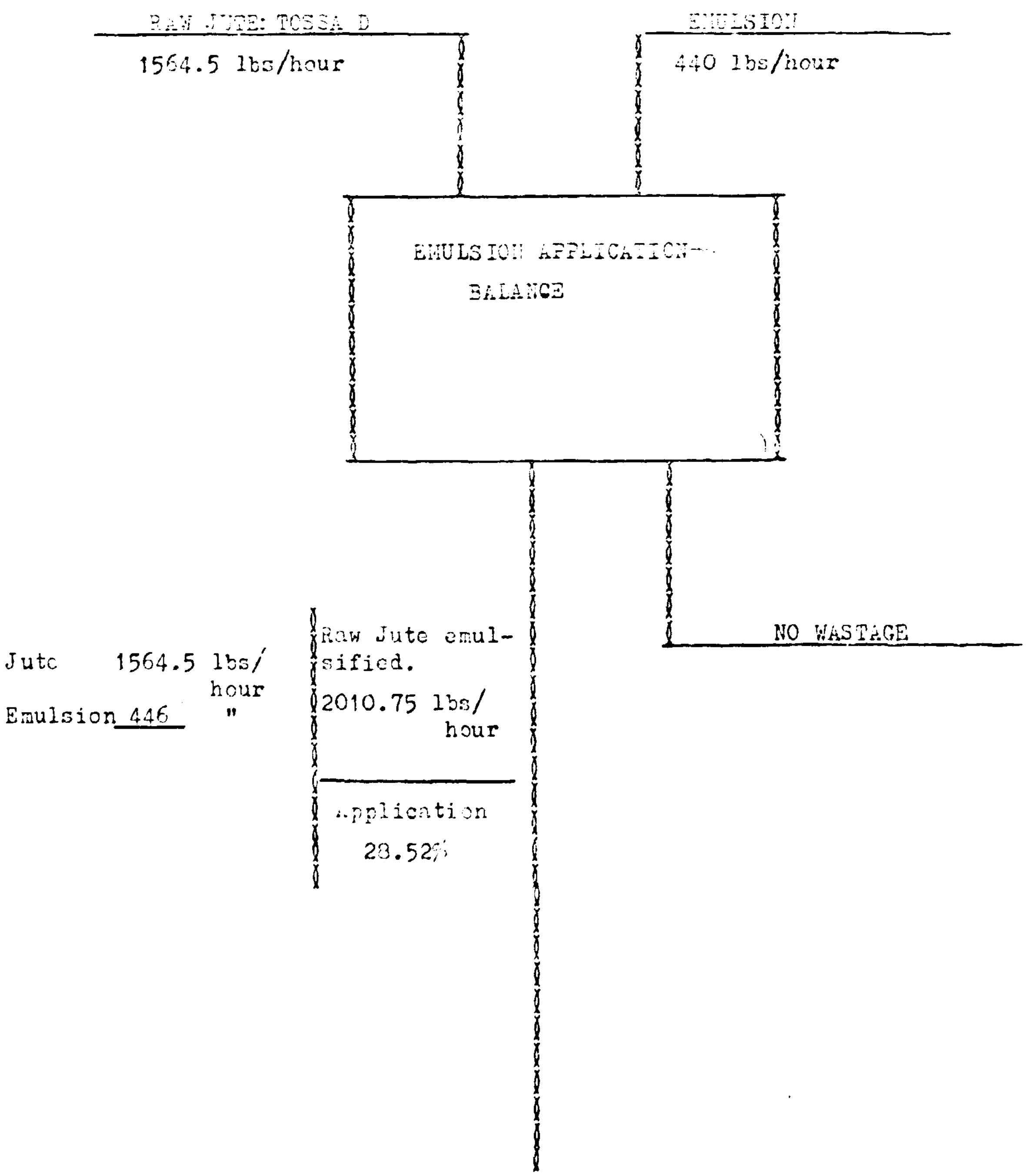
s. p. a.

ANNEX 10/J

EMULSION APPLICATION TEST

SPREADER NO.2



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s. p. a.

ANNEX 10/K

EMULSION APPLICATION TEST

SOFTENER NO.2

RAW JUTE: WHITE X BOTTOM

888 lbs/hour

EMULSION

320 lbs/hour

EMULSION APPLICATION
BALANCE

EMULSION WASTAGE

171 lbs/hour = 53.44%

Jute 888 lbs/hour
Emulsion 149 "

Raw Jute emulsified.

1037 lbs/hour

Application

16.93%

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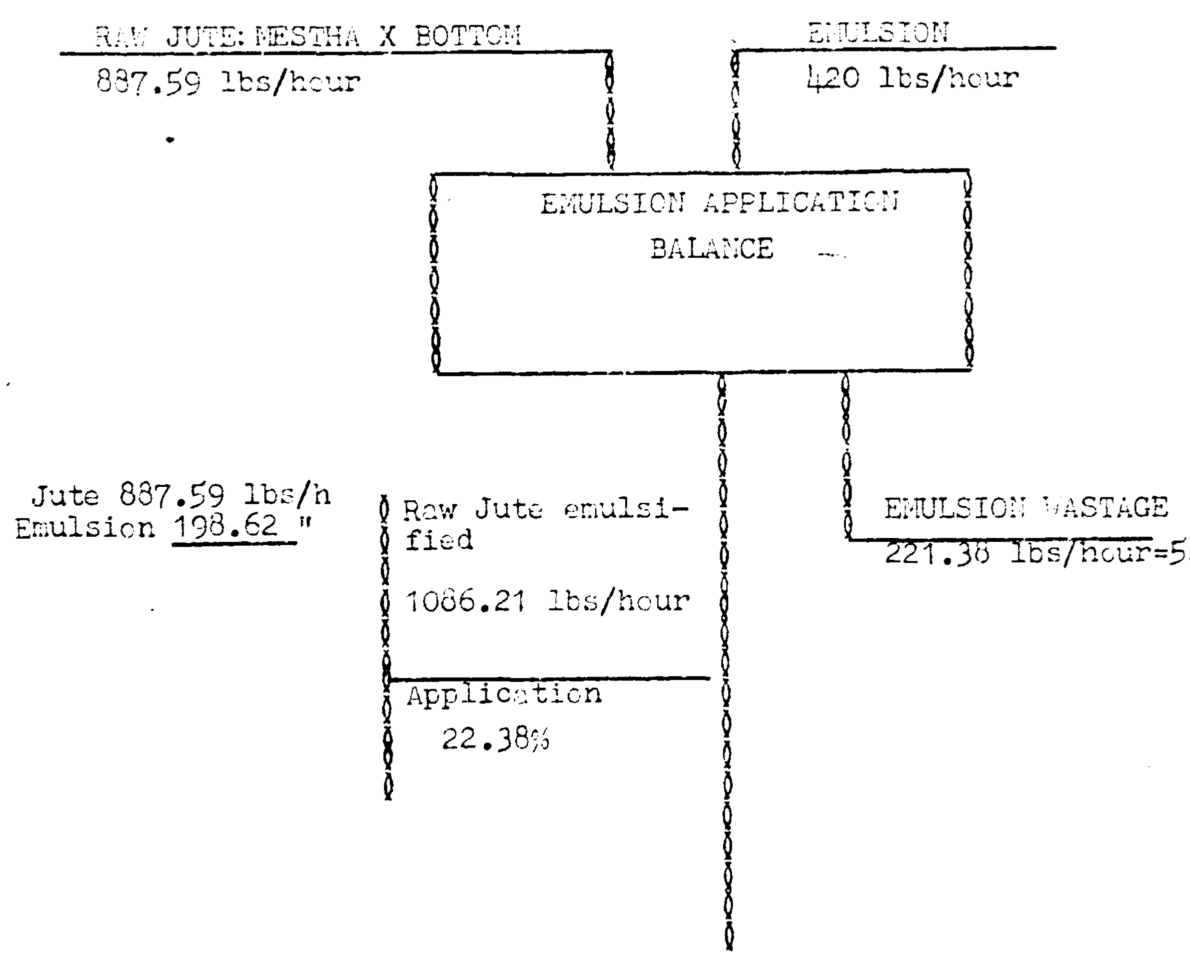
s. p. a.

ANNEX 10/L

EMULSION APPLICATION TEST

SOFTENER NO.3



ANNEX 11

PLATINUM JUBILEE JUTE MILLS LIMITED
TOWN KHALISHPUR:KHULNA

OIL TEST:-

Quality of Jute :- W.X.Bottom.

Sample taken from the Matured pile.

Pile was made with Extra emulsion application by hand spray.

Root ends - 4.4%

Middle (Soft Jute)- 3%

Top end(Soft Jute)- 3%

Sd/-
Quality Con.Officer

Sd/-
Sr. Assistant

Sd/-
Counterpart
UNDP/UNIDO

borghi e baldo ingg.
s.p.a.

ANNEX 12/A

PLATINUM JUBILEE JUTE MILLS LTD.
KHULNA

Dt. 5.10.79

% of oil content in matured jute (White X Bottom), the pile was made after applying emulsion by Dipping system and from spray tray.

Root ends	-	3%
Soft end(Middle part)		2.5%
Top end	-	5.5%

Sd/-
QUALITY CONTROL OFFICER.

Sd/-
COUNTERPART.

borghi e baldo ingg.
s.p.a.

ANNEX 12/B

PLATINUM JUBILEE JUTE MILLS LTD.

Date 20-9-1979.

SOFTENER NO. 3

DIPPING TEST

72.50 lbs wastage emulsion taken to the Drum for DIPPING

100 lbs (one hundred lbs) Raw Jute.

No emulsion application from Metering Unit on the Softening Machine.

Delivery WT = 147 lbs.

Emulsion Application by Dipping. only = 47 %

Total Emulsion in the drum was 72.50 before dipping.

After Dipping Rest Emulsion in the drum was = 24.50 lbs. So from this total Emulsion absorbed is 48.00 lbs.

Counterparts -
Mr.Kamaluddin Ahmed
Mr.Abul Basher

borghi e baldo ingg.
s.p.a.

TEAM ADVICE

1) The workers assigned to softener feeding should be trained for long period to a feeding rhythm the more uniform as possible.

2) The feeding speed of softeners should be proportional,as far as possible,to the average total length of the fibre which is going through the machine.In this way gaps will be reduced at the very least.As it shows clearly in the Annexes(1 to 4),a double feeder is essential, on all the mills.

It is worthwhile to remember that reducing gaps on the feeding cl cloth is one of the main factors to decrease emulsion wastages in softening process.

3) The delivery speed should be higher in comparison to the feeding speed of about 10-15%. In this way jumps will be reduced at very least, with consequent improvement on the efficiency of the machine.

4) The percentage of oil,which should be applied to the fibre, should be predetermined.From this datum the percentage of oil in emulsion will be worked out,and consequently the flow of emulsion.

5) Flow Chart of emulsion,or emulsion and water, coming from the distribution valves should be recorded in every mill for each machine: the flow should be checked to control the constancy and continuity of the same with time.We will point out in this connection the need of accurate cleaning on the application plant (See Annex 5).

6) Once the distribution valves will be calibrated on the grounds of requirement, from time to time it should be checked if the quantity of emulsion applied is in conformity with the desired quantity. Only slight adjustments on the valves calibration will be then necessary to obtain the desired amount.

7) It should be remembered that the final purpose of emulsion application is to apply oil on fibre in the most uniform way and in the required quantity. Some application systems checked on some mills are absolutely wrong and not economic (See Annex 8).

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s.p.a.

ANNEX 14

AVERAGE DAILY PRODUCTION FROM SPREADER AND SOFTENER

A. SPREADER

1. Delivery speed = 70 yds/minute
2. Sliver weight = 60 lbs/100 yds.
3. Assumed Average Efficiency = 50%
4. Production per hour/machine= $\frac{70 \times 60}{100} \times \frac{60 \times 0.5}{2240}$ = 0.562 Tons/hour/machi
5. Daily working time/machine = 16 hours.
6. Daily production/machine = 0.562 x 16 = 9.0 Tons/day.
7. Total no.of machines running = 4
8. Total daily production = 9.0 x 4 = 36 Tons/day.

B. SOFTENER

1. No.of feeders = 2
2. Average Morrah fed = 16 morrah/minute
3. Assumed Average Efficiency = 50%
4. Assumed Average weight of the Morrah = 2.25 lbs/morrah
5. Assumed average emulsion application = 25%
6. Production perhour/machine = $\frac{16 \times 60 \times 2.25 \times 1.25 \times 0.5}{2240}$ = 0.6 Tons/hour/machine
7. Daily Working Time/machine = 16 hours/machine
8. Daily production/machine = 0.6 x 16 = 9.6 Tons/day
9. No.of machines running = 3
10. Total daily production = 3 x 9.6 = 28.8 Ton/day

Total Daily Production : (a) From Spreader : 36 Tons
(b) From Softener : 28.8 Tons
Total ... 64.8 Tons

Actual daily production in spinning Department of Mill No.1 in Platinum Jute Mills is about 54 Tons/day.

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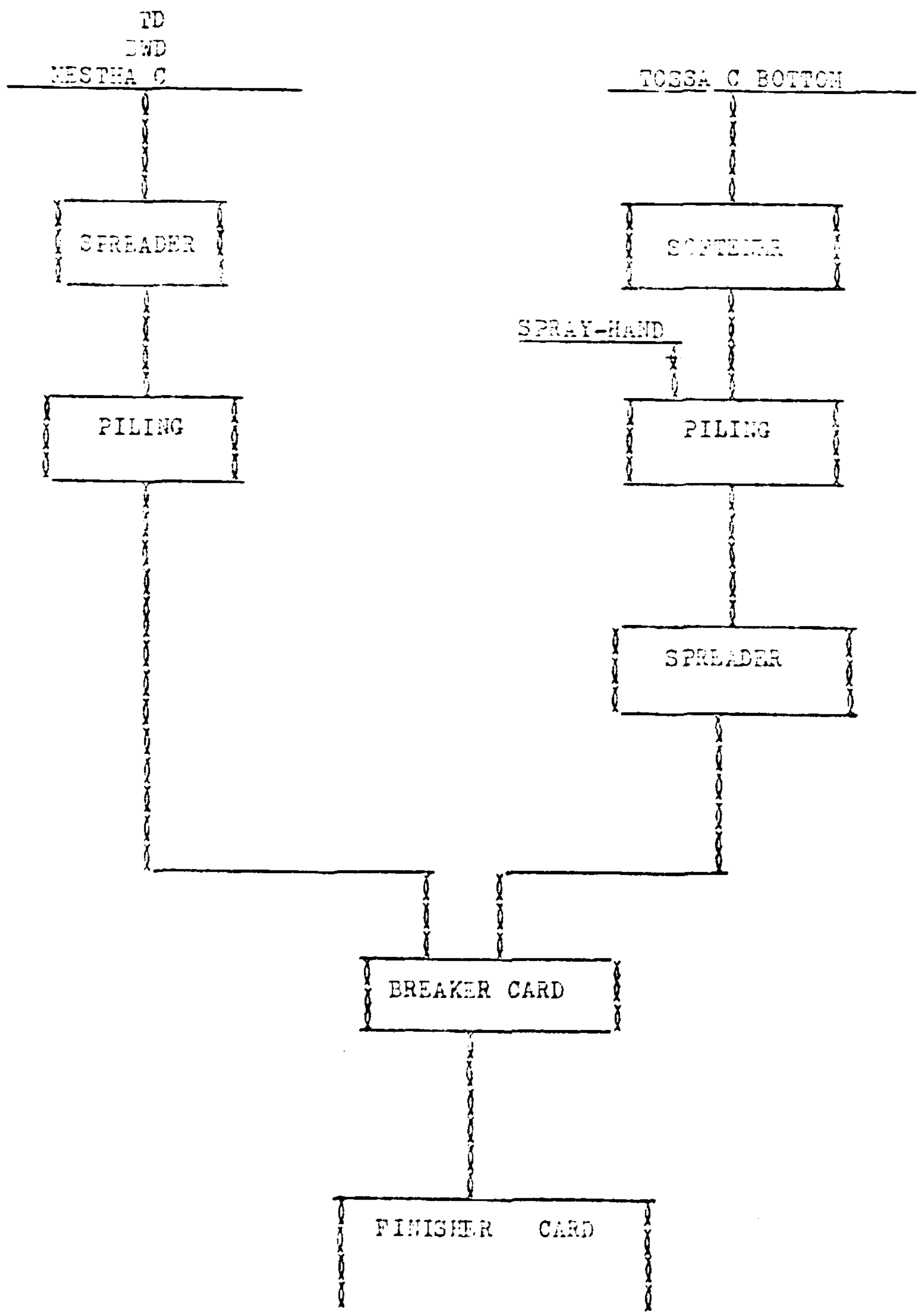
ANNEX 15A

HESSIAN WARP



RUNNING UPTO 30.9.1979

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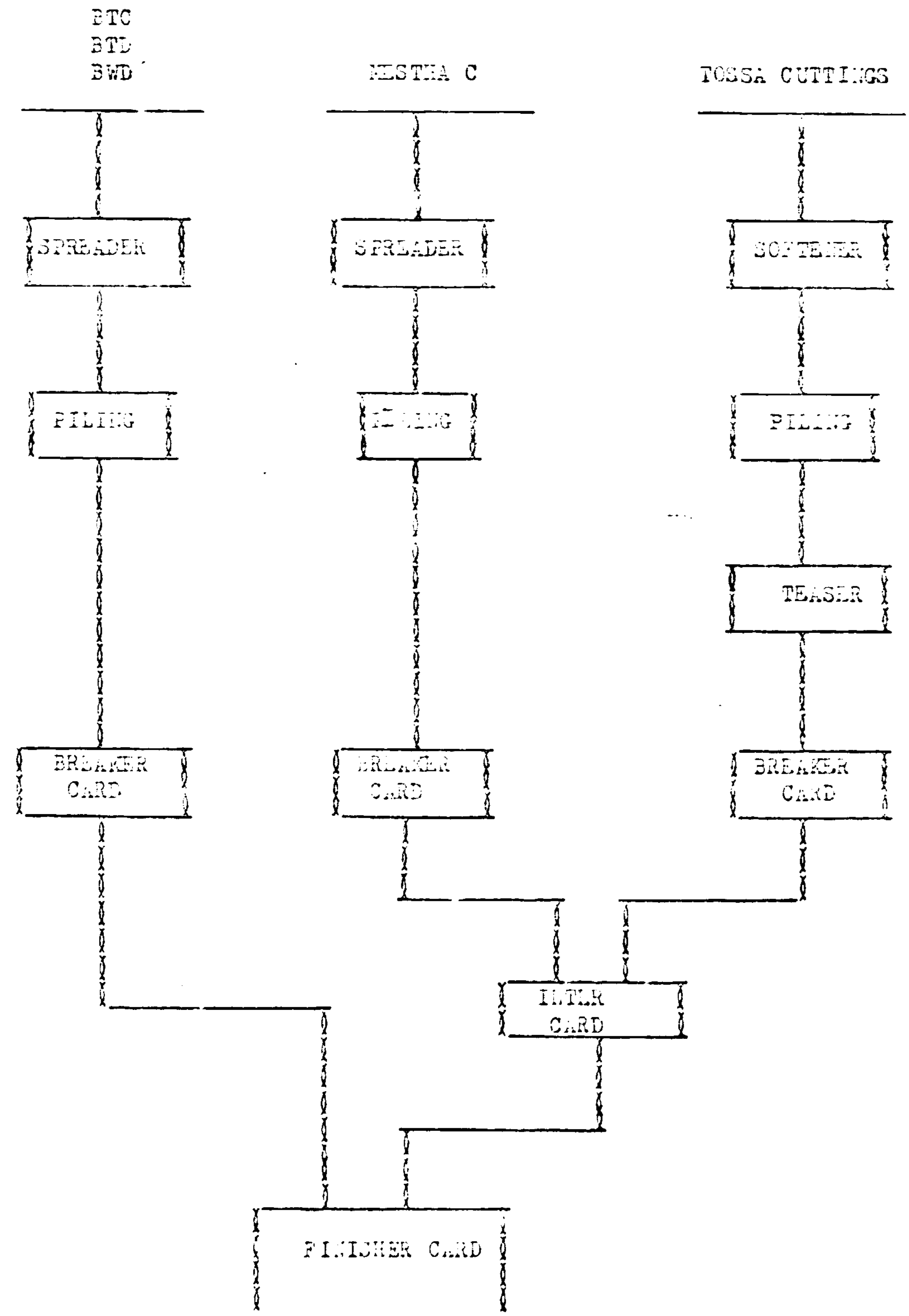
ANNEX 15B

HESSIAN WARP



RUNNING FROM 1ST OCTOBER, 1979

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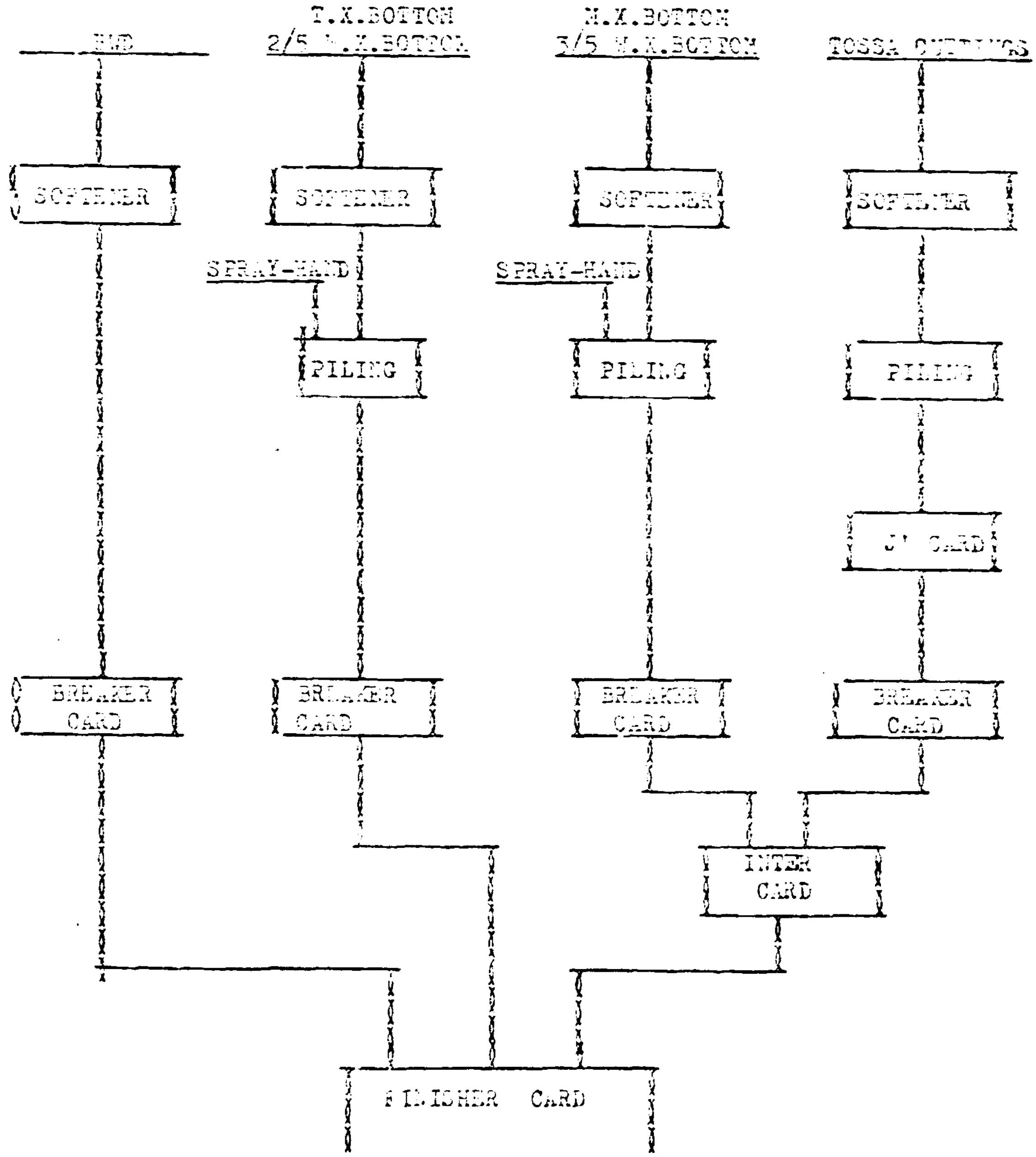
s.p.a.

ANNEX 15C

HESSIAN WEFT



ACTUAL PROCESSING

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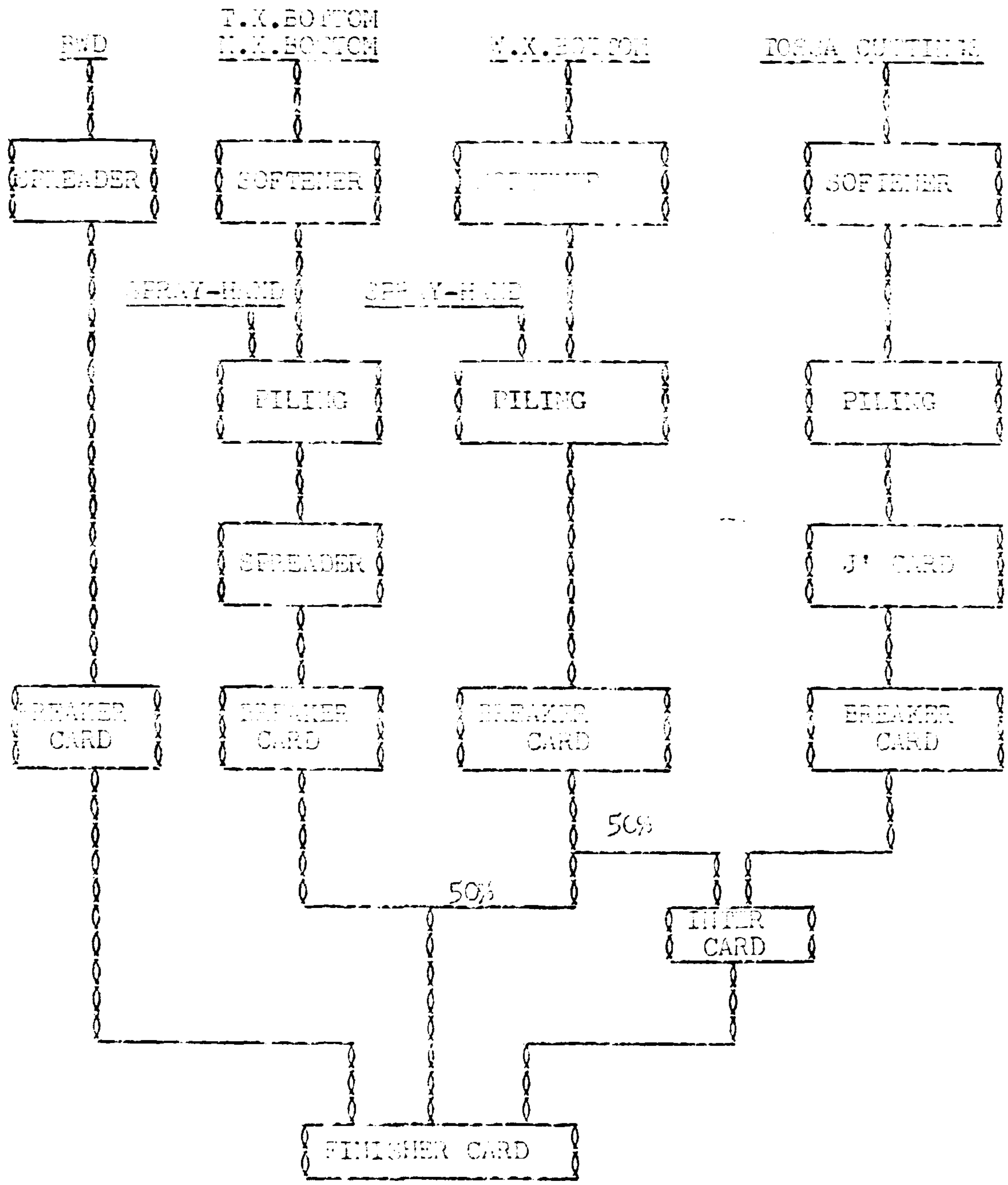
ANNEX 15D

SACKING WARP



ACTUAL RUNNING

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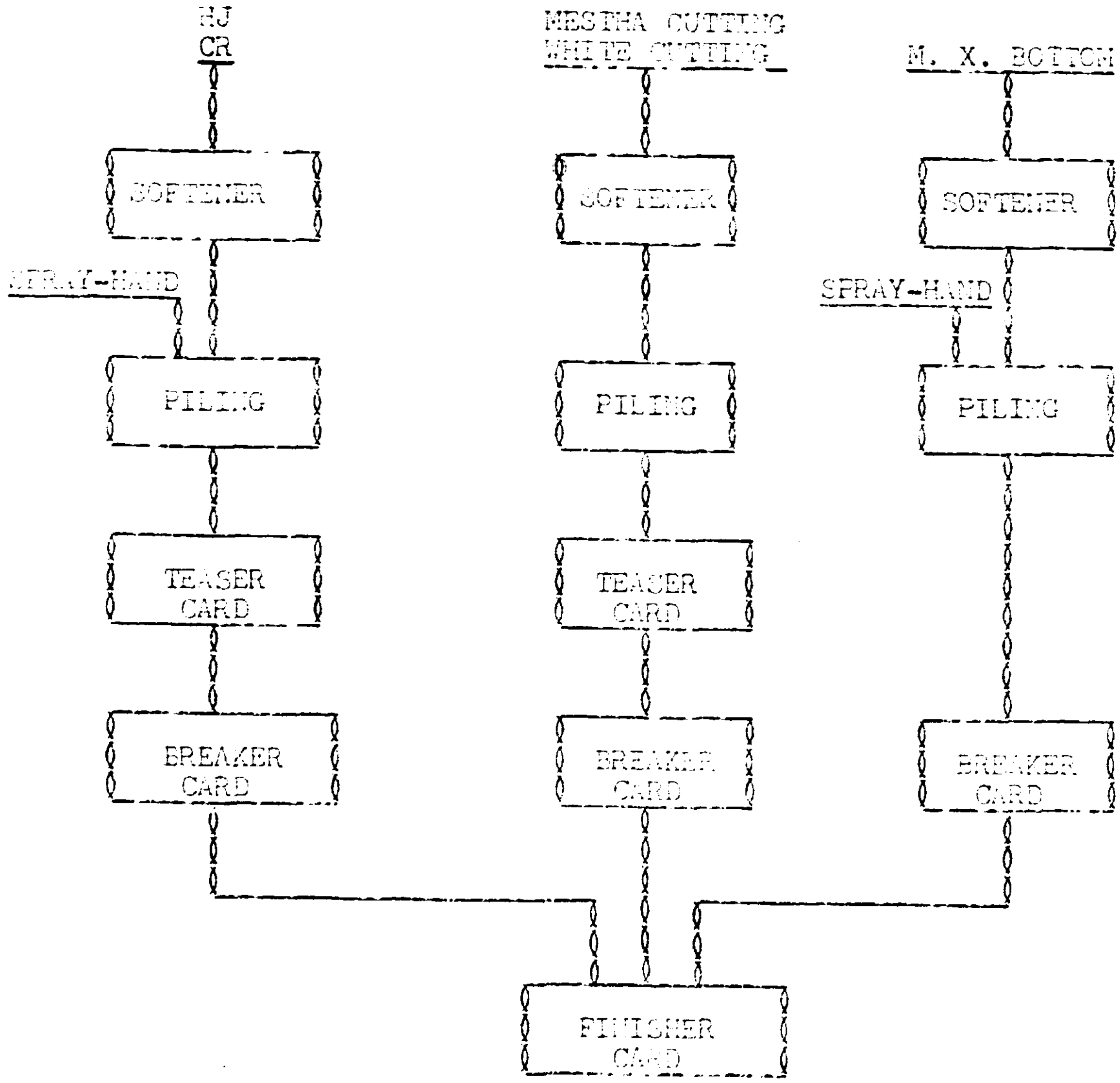
s.p.a.

ANNEX 15E

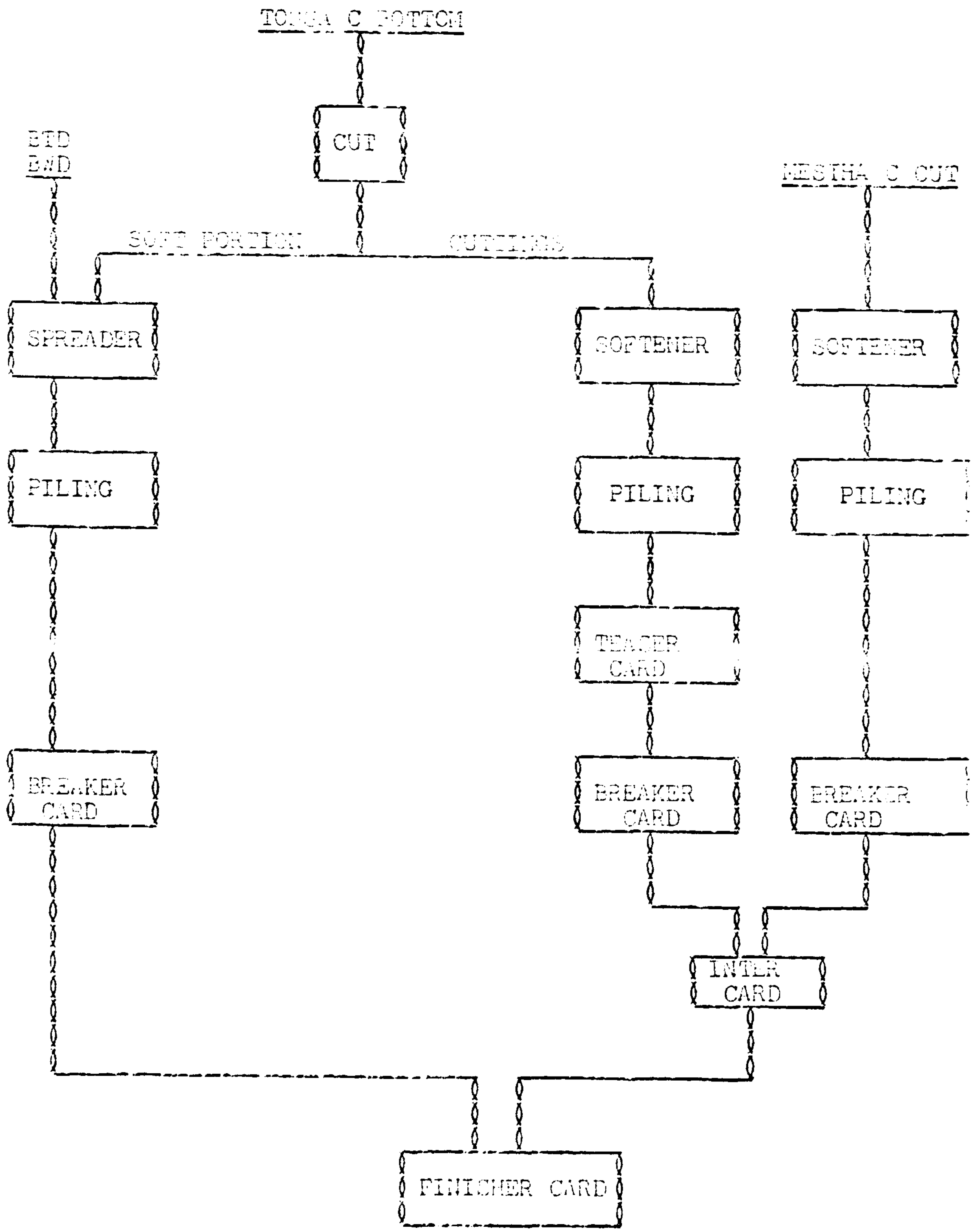
SACKING WEFT



ACTUAL RUNNING

ANNEX 16A

HESSIAN WARP



PROPOSAL

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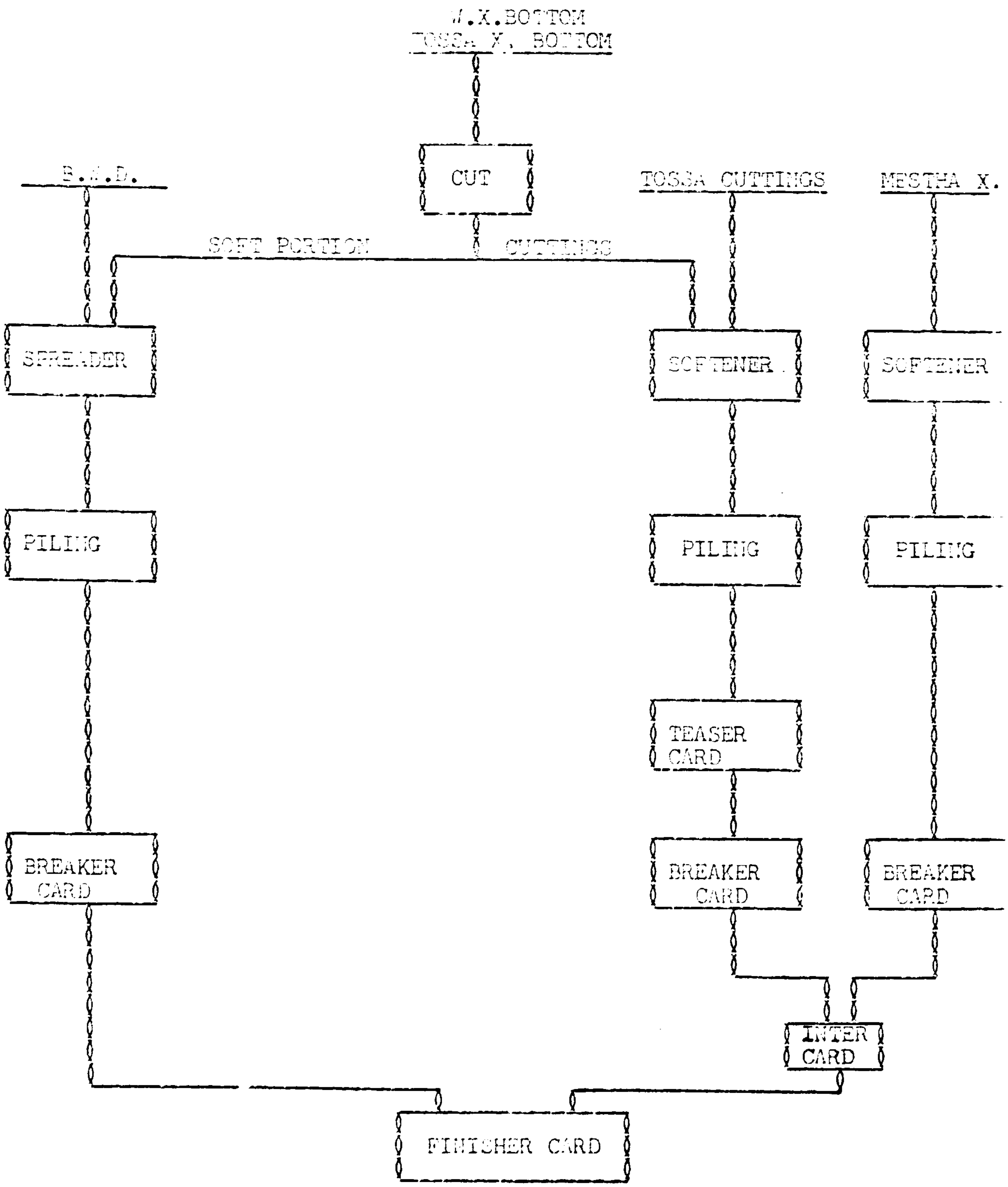
s. p. a.

ANNEX 16/B

HESSIAN WEFT/SACKING WARP



PROPOSAL

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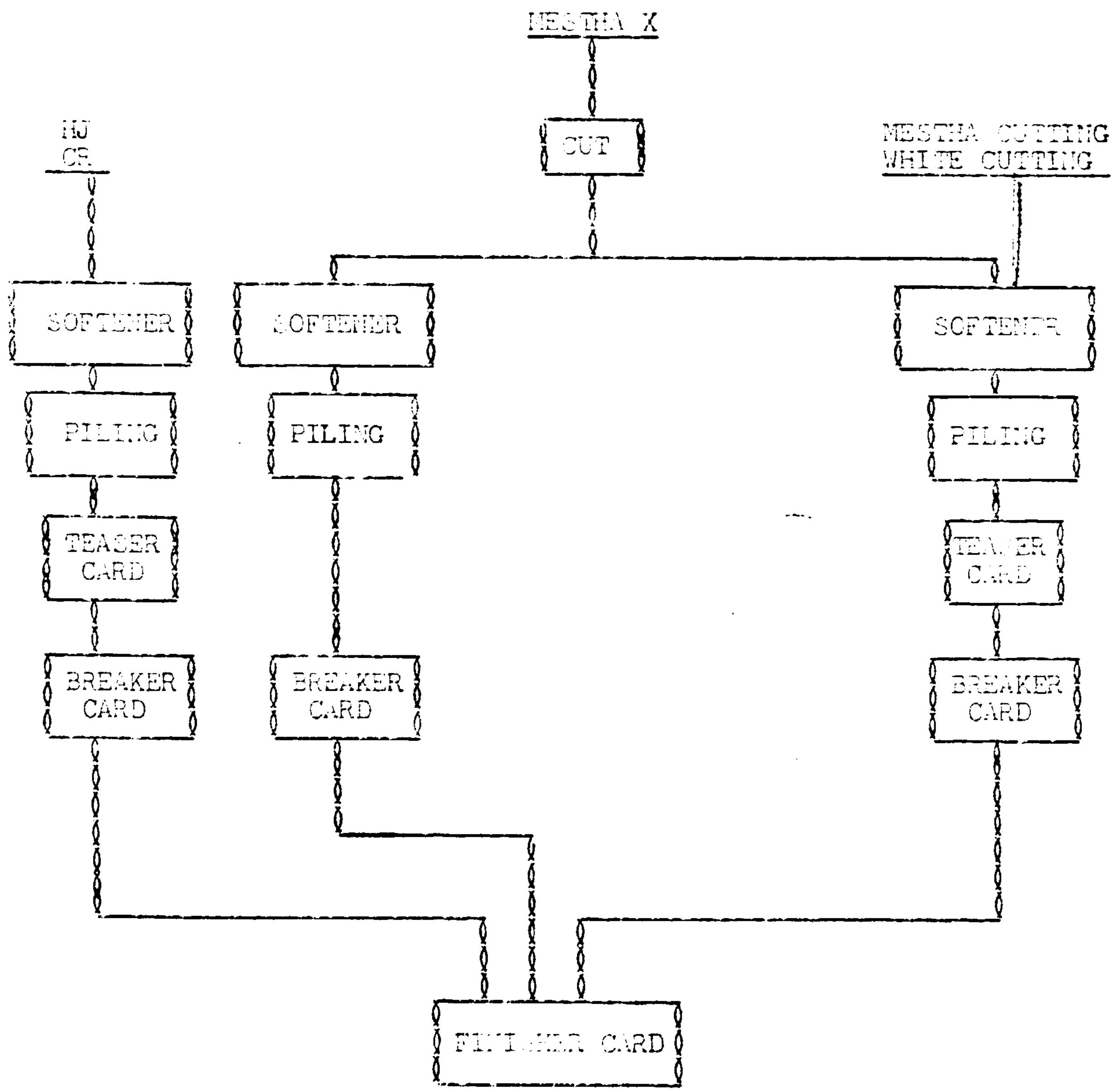
SACKING WEFT

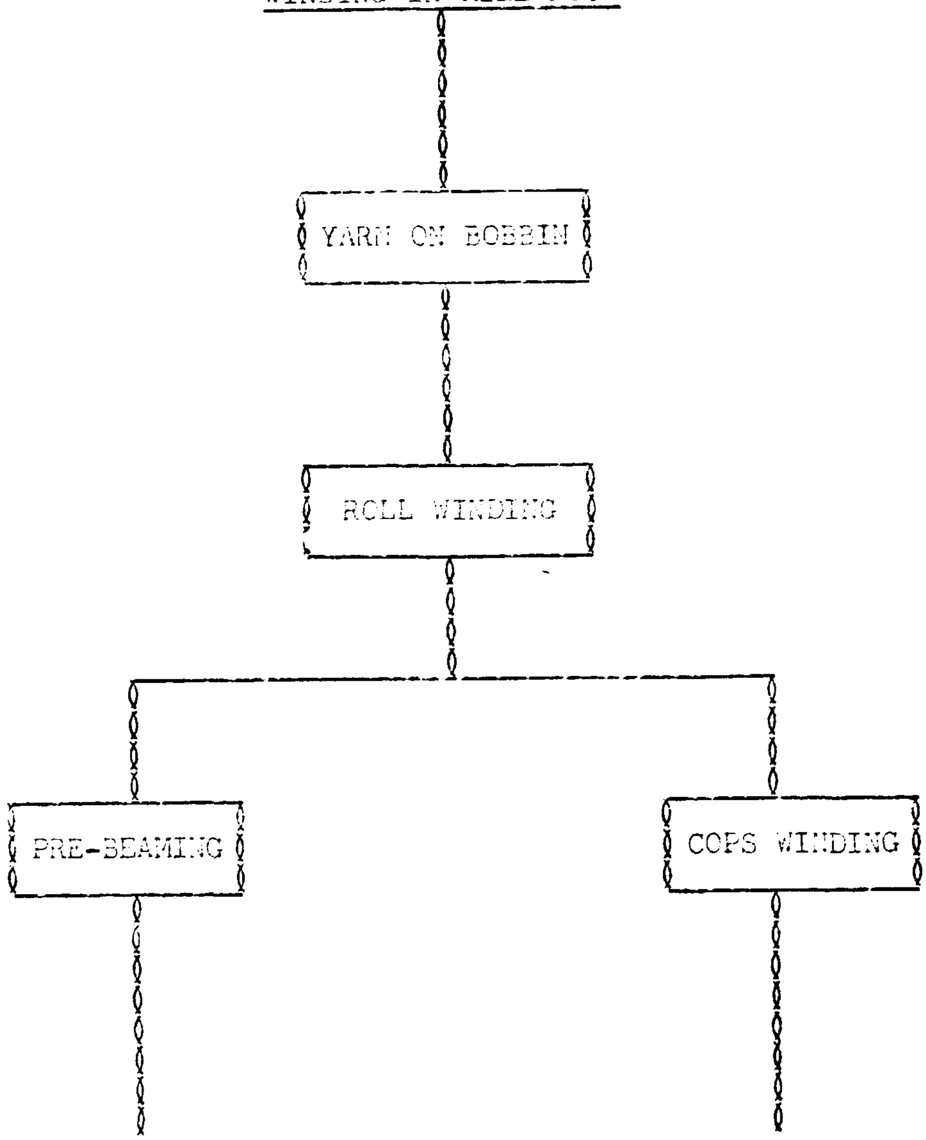
ANNEX 16/C



PROPOSAL

ANNEX 17

WINDING IN MILL NO.2



ACTUAL

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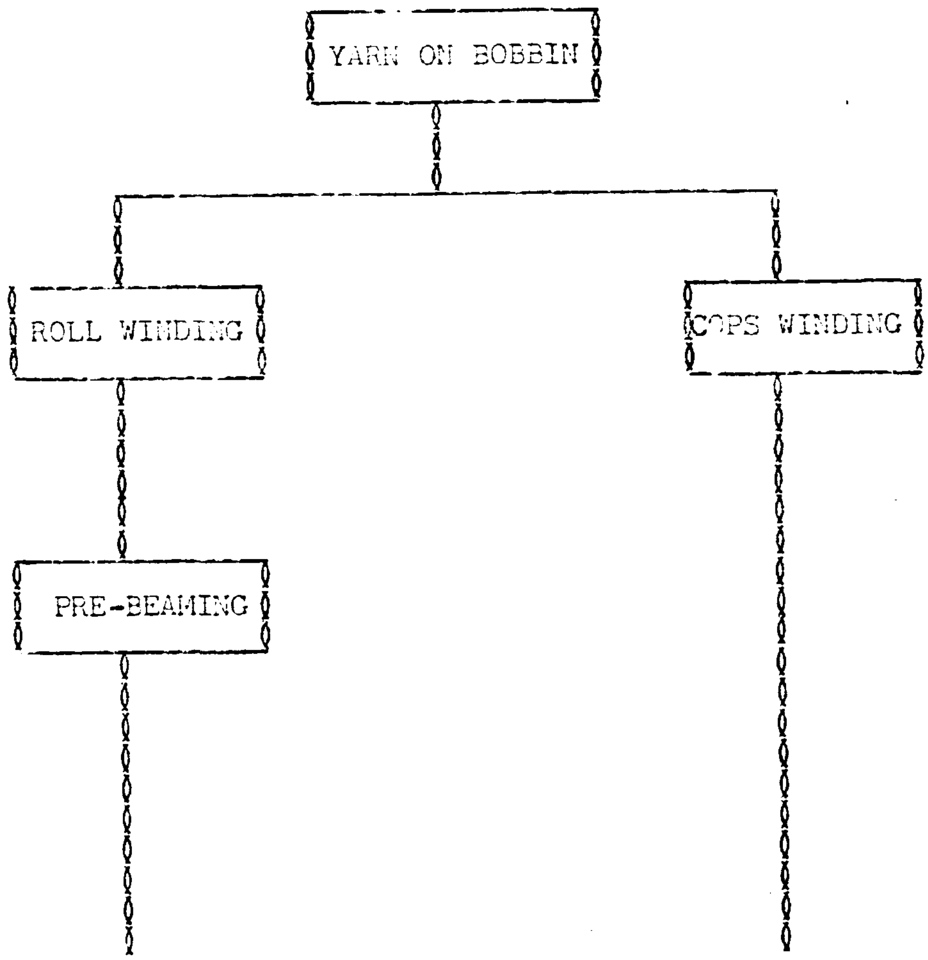
ANNEX 18

WINDING IN MILL NO.2



PROPOSAL

UNITED NATIONS INDUSTRIAL DEVELOPMENT ORGANIZATION

10138 (c)

JUTE INDUSTRY DEVELOPMENT PRODUCTIVITY IMPROVEMENT IN BANGLADESH

(UNIDO CONTRACT N° 77/105 - PROJECT N° DP/BGD/73/043)

FINAL REPORT

VOLUME III: ANNEXES V–XXX

MILAN, JUNE 1980

Consulenze e progettazioni industriali
borghi e baldo ingg.
s. p. a.
Via Amedei 15
20123 Milano
Telefono 8579

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UNITED NATIONS INDUSTRIAL DEVELOPMENT ORGANIZATION

JUTE INDUSTRY DEVELOPMENT PRODUCTIVITY IMPROVEMENT IN BANGLADESH

FINAL REPORT

(UNIDO CONTRACT N° 77/105 - PROJECT N° DP/BGD/73/043)

VOLUME III : ANNEXES V-XXX

MILAN, JUNE 1980

Index Annexes (cont.) Page

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Index Annexes (cont.)

Index Annexes (cont.)

Index Annexes (cont.)

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Index Annexes (cont.)

SYNOPSIS

The Borghi & Baldo Productivity Team examines the problems encountered in the Bangladesh Jute Industry, with particular reference to Productivity.
The Team submits a series of Reports relative to organization, processing, maintenance and training, in some cases of a general nature and in others referred to four Pilot Mills.
These Reports contain analyses, recommendations and examination of findings. Specific, fundamental faults are found to exist right from the initial phases of the Process and the Productivity Team dedicates particular attention to same.
The Borghi & Baldo Productivity Team also indicates where they feel special effort should be directed in the future.

ANNEX V

ANNEX

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s. p. a.

REPORT ON

CHITTAGONG JUTE MFG. COMPANY LTD.

BY

UNDP/UNIDO PRODUCTIVITY TEAM

November, 1979

borghi e baldo ingg.
s. p. a.

REPORT ON CHITTAGONG JUTE MILLS(C.J.M.C.L.)

1) Morrah Weight:

In Chittagong Jute Mills 3 different standards for the morrah weight are in operation (see Annex 1), namely :

From 2 to 3 lbs for uncut jute
From 2 to 2.5 lbs for cut jute required by C.B.C.
From 1.75 to 2.25 lbs for uncut jute of low quality

The control of morrah weights is organised in the following manner:

a) Uncut Jute (Standard 2-3 lbs) = As for an old habit of this mill, the Q.C. Department is checking daily some morrah weights. The checkings are based on single worker-side and are carried out directly in the storehouses, with the help of proper scales.

In Annex 2A-2B we have collected some results of the above checkings.

b) Cut Jute(Standard 2-2.5 lbs) & low quality uncut jute (standard 1.75-2.25 lbs). =

The Q.C. Department is carrying out checkings at random and not in a regular way.

In Annex 2C-2D we have collected some results of those checkings.

On our side, we have worked out the final results of all the previous checkings and we have condensed them in Annex 3.

This Annex is useful for our remarks on the general situation, remarks which are the following ones :

1) Uncut Jute = the standard rangeisquite wide (1 lbs) and the mill old habit of daily single worker checkings are allowing to obtain :

- about 94% of tests inside the standard ranges
- C.V. of each worker about 10%

Those results are quite good, but still they can be improved, taking in proper account the fact that the standard range are so wide.

Contd....P/2.

2) Cut jute and low quality uncut jute = the remarked irregularity is very high :

- only 56% and 65% of tests are inside the standard ranges
- C.V., on random tests, is about 26.86% and 16.72% respectively.

We should remark that the maximum of irregularity is pointed out just for cut jute, selected for C.B.C: instead this particular type of production should start with the maximum of regularity due to the final counts of yarn to be produced (7-7½) and to the good quality of raw jute concerned.

- During this year the Team counterparts in Chittagong Jute Mills did run practical training courses to the workers present in the Department. In the immediate period following the training, on 750 tests carried out for a total of 30 workers, the 97% was showing inside the standard ranges. These tests concerned uncut jute, with standard ranges from 2 to 3 lbs.

1-A) Productivity Team Proposals:

- We should remember that the Productivity Team, on the 20th April, has already produced a general report on this particular problem, with specific proposals.
- We enclose copy of pages 4/5 of the above report (see Annex 4), with our general proposals.
- Concerning particularly Chittagong Jute Mills, we think that:
  - for uncut jute (2-3 lbs) it should be advisable to increase the correction of faults coming out from the daily checkings.
  - for cut jute (2-2.5 lbs) and low quality uncut jute (1.75 to 2.25 lbs):

    It should be advisable to carry-out daily checkings and on single workerside (not at random, as the actual normal practice). Only after this type of control will become a dail routine, the second phase of correction of faults for the workers involved will be carried out.
- In any case, control and correction of faults should be carried out by the Q.C.Department, not by itself but in close collaboration with the officer in charge of the Batching Dept.

Contd....P/3.

- Control and correction of faults should be particularly aimed to the new workers ("badly") to reduce to a minimum their faults.

- As final advice, the Productivity Team will suggest only one standard morrah weight for all the qualities of jute. As an example, if the standard ranges assumed will be from 2 to 3 lts. good results will be easily achieved and it will be easier to carry out the same type of training for all the workers.

2) Emulsion Preparation:

In Chittagong Jute Mills emulsion is prepared in two different plants :

- a conventional plant for mill No.1
- two Rapisonic type plants for mill No.2 and CPC.

a) Conventional Plant in Mill No.1 = It was previously formed by 2 big tanks, with very slow agitating blades, and it never showed satisfactory results, concerning emulsion stability.

- To increase the stability period, the Productivity Team, together with its own counterparts in the mill, has run different tests = we never reached some satisfactory results and the stability period always showed up in a not acceptable way (See Annex 5).

- Therefore the Team, convinced of the total inefficiency of the plant, suggested the replacement of the plant itself (See Annex 6A/6B).

- The mill management agreed to our suggestions and it was decided to build a new plant, on the same basis of the plant installed in Dacca Jute Mills.

- The new plant has already been installed, tested and put to work.

- The results are quite good, particularly if compared with the previous ones from the old Plant (See Annex 7).

Contd....P/4.

- Our opinion is that the low efficiency in the spinning deptt. of mill No.1 resulted from the very bad quality of the emulsion utilized. The new plant will be the first step for the implementation in the spinning.

b) Rapisonic plants in Mill No.2 and CBC = Also, for these plants, many tests have been run, with the final aim of achieving the maximum possible stability.

- In the enclosed Annex 8 we have condensed the results of the last tests.

- By comparing the tests run on the new conventional plant and on the Rapisonic Plants, we can remark that :

  - Using as emulsifier ISSAPOL (a local product, with easy possibility of finding) on the same 0.5% proportion, we reach very bad results on the conventional plant but much better results, even if not perfect ones, on the Rapisonic Plants.

  - In any case, the quality of the emulsion results not only from the plants but also from the elements on which the emulsion itself is based.

  - On Chittagong Jute Mill we remark :

c) Jute Batching Oil: It is normally supplied from the manufacturer (Burma Eastern). The Q.C.Department is well equipped for testing the quality, but there are no regular checkings on the different deliveries. Particularly viscosity, density, PH smell, colour, presence of sediments, flash-point, etc. can easily change from one lot to another, varying the characteristics of the final emulsion.

- Any way the Jute Batching Oil, used at Chittagong Jute Mills, is showing the same characteristics of :
  - dark colour
  - smell of kerosine
  - presence of sediments

  already remarked in the other Pilot Mills.

Contd....P/5.

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s.p.a.

d) Water = normal water is utilised, picked-up from subsoil and directly cycled. Also in this case in spite of good equipment, the Q.C. Department is not carrying out any checking, about PH hardness, impurities etc.

e) Emulsifiers = different types are utilised, from the locally made ones to the imported ones.

- We notice that the different products are not utilised, as for quantity and form of employ, according to their technical characteristics (see solubility at different temperatures, etc.)
- It seems that the bigger worry at mill management level is to reduce this cost incidence on the final cost, not taking into proper account the fact that emulsion is a very important factor in the working process and that savings on this particular point should be carefully estimated.
- We should remember that emulsion should be stable for at least 24 hours.
- Without such stability period, it is impossible to achieve a uniform application of oil on fibre.
- With a desired uniform application, a continuous lubricated coat will be formed on the fibre, which will assure a uniform maturing process of jute during piling and a good carding process, with pins combing the fibre without any tear.

2-A) Productivity Team Proposals.

- The Productivity Team has already produced on the 3rd of May a general Report on this subject, with different remarks and proposals.
- We enclose copy of pages 10 and 11 of the Report (See Annex 9) with our general proposals.

In particular, for Chittagong Jute Mill, we can add :

a) J.B.C. this problem can only be solved at BJMC level as suggested in the general report. At mill level, we suggest for each delivery the max. possible N° of tests, conveying the results to the Corporation for the following steps.

Contd....P/6.

For want of a fixed standard, at the moment it will be only possible to contest to the producer, the relevant differences between one delivery and the following one.

b) Water = We suggest some regular analysis of the water are made to estimate the problem in a more correct way, also in connection with the desirable installation of a water softening plant. About the general advantages of these plants, we have already expressed our opinion in the Platinum Jute Mills Report. We enclose our remarks (See Annex 10)

c) Emulsifiers = It is possible to utilise the most different products, but always according to their own characteristics.

- Every new product should be carefully tested, before adopting the same in the process.

d) Plants = the replacement of the old conventional plant, with the new results achieved, seems to have solved part of the problem.

- However, it is our opinion that Rapisonic Plants, if well maintained, are able to give better results, as a general rule.

- We should remember that the mill is equipped with two modern Rapisonic Plants, in fairly good conditions.

- Each one of these plants is able to produce 2700 lbs of emulsion per hour, with a content of 1350 lbs of oil per hour.

Assuming an average application of about 6.5% of oil on fibre, each one of the plants is able to produce emulsion for : $\frac{1350}{0.065} \times \frac{24}{2240}$ = 222.53 tons of raw jute per day, working in 3 shifts.

- The actual production of the spinning Department in Chittagong Jute Mills is about 96 Tons per day, on 3 shifts.

Contd.....P/7.

- It follows that one plant by itself is able to supply emulsion to the 3 mills, working at about 43% of their own capacity ($\frac{96}{222.53} \times 100 = 43.14\%$).
- We suggest the mill management considers this problem with the proper attention.
- It will be sufficient to shift the Rapisonic Plants in a more central position in respect to the machines to be supplied and to study the concerning pumps and pipes.
- The new conventional plant could be utilised to recover the emulsion.
- Utilising only Rapisonic Plants as emulsion makers, it will be possible to apply the same always through the Metering units.
- It is well known that these units will allow an exact adjustment of the emulsion fluxes, and therefore a more regular application and less wastages.

3) Emulsion Application: At Chittagong Jute Mill emulsion is applied on fibre on the following machines:

No. 7 softeners at mill No.1
No. 2 softeners at mill No.2
No. 2 softeners at CBC Mill
for a total of 11 softeners.

- These machines are only partially utilised, in fact, as a rule, only the following machines are at work :

In Mill No.1 3 softeners for 3 shifts (4 soft. idle)
In Mill No.2 1 softener for 3 shifts (1 soft. idle)
In Mill CBC 1 softener for 3 shifts (1 soft. idle)

for a total of 5 softeners working on 3 shifts and 6 softeners idle.

- The machines are feeded by 2 feeders, but not as a rule, because sometimes it is possible to spot machines working with single feeder.
- Our Team counterparts in the mill did run a serious of tests about:
- Working condition of metering units on Mill No.1 softeners (See Annex 11)

Contd......P/8.

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s.p.a.

- Example of flow-chart on one of the 2 softeners in Mill No.2 (see Annex 12).
- Checking of feeding and delivery speeds of all the machines.
- Checking on the average feeding rhythm with one or two feeders (See Annex 13)
- Control of percentages in emulsion application, in connection with different valves setting on the metering units(See Annex 14).
- Our remarks about all these tests, are the following ones :
  a) due to the actual condition of the metering units,there is no possibility to adjust the emulsion fluxes on the different machines. It follows high and uncontrollable percentages of emulsion wastages.
  b) the flow-chart is showing a high degree of irregularity, particularly in the water flux and in the lower scale of the setting. This can derive either from valve faults or from irregularities in the water pressure.
  c) it is our opinion that the speeds of the different machines are too high, either on feeding or on delivery side. The actual speed ratio will cause many "jams" during the machines work, with following losses of efficiency and increase of emulsion wastages.

     We should notice that the differences in speed between the softeners result mostly due to differences in speed of the engines.
  d) There is no connection between the average feeding rhythm of of the workers and the feeding speed of the machines. This will cause quite a number of gaps between one morrah and the following one, gaps which will increase when only one feeder will be posted, with consequent high emulsion wastages.
  e) There is no connection between the application percentages and the emulsion fluxes. As a general consideration, it is possible to notice the greater the flux less is the application. This is mainly due to irregularity in the morrahs feeding, a common error if we take into proper consideration that we speak of a manually performed operation.

Contd.....P/9.

- From all the previous remarks it is easy to demonstrate that the emulsion wastages, in the complete application process at CJMCL, are not below an average of 40% (see Annex 15).
- During this working phase, we can therefore notice 4 different irregularities :
    - on the morrahs weight
    - on the workers feeding
    - on the oil and water percentages in the emulsion
    - on the emulsion flux

  These irregularities will add one to the other, with the final consequence of high irregularity of oil application on fibre, which will cause irregular piling and bad carding.
- We should point out that CJMCL is equipped with a centralised system of recovery of emulsion wastages, from all the working machines. All the wastage is collected in the conventional plant of mill No.1, in some way remixed with different quantities of oil and emulsifier and afterwards reput into cycle for application in Mill No.1. (Annex 16)
- On a daily consumption of about 11 emulsion tanks in mill No.1, only 2 tanks are formed from fresh emulsion, while the other 9 tanks are formed by recycled wastage.
- We should also remark that, due to the low stability, the recovered emulsion is very often totally broken and in any case, is polluted by dust and impurities.
- It clearly follows that wastages, too many in quantity and of low quality, are spoiling the emulsion quality in mill No.1, with the consequence of spoiling the following working phases as piling, carding and ultimately the spinning efficiency.

3-A) Productivity Team Proposals:

- Our Team has already produced, on the 16th of August, a general Report on the particular problem.
- We enclose copy of pages 6-7 of this general report (see Annex 17), with our general advice.

Contd....P/10.

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s.p.a.

- particularly for C.ICL, our advice is:-

a) Maintenance on metering units = We think that the first step should be to put into correct operation all the metering units installed on the machines : only by that operation will it be possible to increase the application regularity and to reduce the wastage. In the meantime the flow-charts of all the machines should be worked out.

b) Feeding of softeners = there should always be 2 feeders for each machine. The workers should also to trained to adopt a feeding rhythm the more uniform as possible.

c) Speed of softeners = it should be related to the feeding ratio of the machine feeders.

d) Supervision = to improve the supervision and therefore the efficiency of the machines, we suggest that all the machines should work as much as possible during the daytime shifts.

with { 3 softeners by 2 shifts.
{ 8 softeners by 1 shift.

We will have 112 hours per machine in total, against the actual 117.5

The small difference will be easily compensated by higher efficiency due to the use of 2 feeders, but in the meantime the supervision will be improved.

- New Machinery installation:

  All our advice, even if joined to the final idea of utilizing only one Rapisonic Plant for the emulsion preparation, will only improve the actual situation, without solving the same in a definite way.

- Due to the final aims to be achieved (increase in application regularity and reduction of emulsion wastage), it is our opinion that it will be quite advisable to consider the installation of some spreader machines, starting from CBC Mill and No.2 Mill.
- In relation to the working advantages of this type of machine we enclose copy of pages 5-6(see Annex 18) from our general Report on emulsion application.
- It is easy to work out that 3 Spreaders by 3 shifts are able to cover the actual production of CBC Mill and No.2 Mill, even assuming a low efficiency for spreaders (See Annex 19).
- We are aware of the cost involved for this new installation, but we are also convinced of a fast degree of depreciation.
- It is our strong opinion that at least all the carpet Backing units of the Corporation should be equipped with spreaders: this is the rule in modern equipment for carpet Backing.

4) PILING:

3 main remarks should be made:

a) Quantity of Jute under piling = in connection with the daily consumption, the quantity of jute under piling is in right proportion, even for different grades (see Annex 20). However we should consider that the rooted part of uncut jute is subjected to 2 different piling processes, one as rooted part the second are as cuttings. This will alter naturally the final proportions of the different jute grades, under piling.

...../

b) Temperature of piling:

- The Team counterparts did run many tests on jute piling for different grades and in different periods of the year. Checkings have been carried out for temperatures, from the day of pile making to the day of opening of the same. All the tests have been gathered in the enclosed Annex 21, the first temperature, for each grade, is the one checked on the day of pile making- the second temperature is the highest achieved, before the opening of the same pile.

From the Annex, we can remark :

b-1) the initial temperatures are connected with the different seasonal temperatures.

b-2) the extreme temperatures are quite irregular either from the initial ones as for the seasonal ones.

b-3) the period needed to reach the highest temperature is quite irregular too, under the same quality conditions.

For instance, White C can reach the highest temperature on the 5th or on the 8th day, during the same month of March. White X can reach the highest temperature in six days during the months of February and April, and in nine days during September.

b-4) the average period of piling is around 6 days for long jute against the normal 5 days.

b-5) cuttings reach relatively low temperatures, even lower than some of the results obtained for Mestha.

- From all the previous remarks, it is our opinion that the piling process is very irregular and out of any control.
- The main irregularity reasons are :
  1) bad quality of emulsion
  2) application out of control and not related to the different characteristics of fibre, to the different seasons, etc.

We should remember that :

the percentage of oil applied to the different grades should be always constant (for instance 5% for long jute, 6% for Mestha - 9% for cuttings).

the percentage of water applied to the different grades should vary in connection with the moisture content of the fibre, with the humid or dry season etc.

3) Piles insulation not correct, in connection with the change of temperature in the environment.

4) not correct working process for cuttings.

C) Hand-spray system = In CJMCL there is the old habit to add water by spray-hand to the roots of uncut jute put under piling.

- This operation, being a hand-made one, is totally out of any control: the quantity of water and the place of application are completely left on the workers themselves.
- We think that the actual system has been adopted for the purpose to achieve a better roots softening and is related to the particular processing cycle in CJMCL, i.e., to the roots cutting after the piling process.
- Evidently the mill management opinion is that by adding water, it is possible to achieve a higher softening of part of the roots with the final result to get, after the cutting process, a higher quantity of soft jute.
- In our opinion the adding of water by spray-hand is the main pre-supposition of the system of cutting the roots after the piling process, that is to say in a position of the working cycle wrong either from the technological side or from the economical one.

4-A) PRODUCTIVITY TEAM PROPOSAL

- About the piles insulation from the temperature changes in the environment, as far as we know, in Bangladesh all the piles are formed in open spaces: the only precaution is to cover the piles with some jute canvas.

- It is our opinion that a correct piling should be formed in enclosed spaces, to avoid as far as possible the consequences of temperature changes, air blasts,etc. utilising for this purpose special boxes on wheels.
- Our Team is available for all the possible advices on this subject, due to this normal practice in European mills.
- About the hand-spray operation, it is our opinion that this operation should be cancelled from the normal processing: as we will see, in the following pages, cuttings should be treated separately.

5) Processing:

- The Productivity Team has checked the processing cycles applied in CJMCL to the different grades of jute to form the 4 main batches:
  - Hessian warp
  - Hessian weft
  - Sacking warp
  - Sacking weft
- The different processing cycles are gathered in the enclosed Annex 22.
- We should remark:

a) Hessian warp = on uncut jute, the following operations are applied:
   i) adding of extra-water through hand-spray,during the piling.
   ii) cutting of roots after piling and use of those cuttings in the Sacking weft cycle, with a new processing of the same.

- About the hand-spray system we have already expressed our doubts on the technical validity in the piling Chapter.
- About the roots cutting it is performed after the piling, that is to say in a position of the processing quite irrational.
- In the enclosed Annex 23 we have quoted the complete cycle undergone by the hardest part of the fibre,as roots first and as cuttings after.
- The actual cycle is the following one :
  - passage of fibre (soft + hard portion) in softener, with emulsion

application= the percentage of application is not the correct one either for the soft portion nor for the hard portion.

- piling of the fibre(soft + hard portion) with water adding through hand-spray in piling period is not the correct one neither for the soft portion nor for the hard portion, without taking into consideration the lack of control during the hand-spray system.
- cutting of roots = the soft portion goes to the Breaker cards, While the cuttings are taken to the processing cycle of sacking weft, where they are often mixed with dry cuttings, coming from warehouse.
- Second passage of the cuttings through the softener, with further emulsion application: if there is mixing with dry cuttings, we will have a incorrect application percentage, both for the dry cuttings and for the already emulsioned ones.
- second piling of cuttings, for a normal period of 9/10 days = as a consequence, a portion of cuttings is undergoing a total piling period of about 15/16 days.
- It is easy to assume from the previous remarks all the faults of the present cycle= In our opinion the worst is the double piling of cuttings. The fermentation process is primed= first time and stopped when not quite completed: afterwards it is primed a second time, after a new application of oil and water. The results will never be satisfactory.

B) Hessian weft - Sacking Warp:

- the remarks are the same ones in connection with the same type of operation as in Hessian Warp(See Point A).
- SMR degree, quite poor one, is undergoing only one passage through Breaker cards, before being put in batch on the Finisher Cards.

C) Sacking Weft:

- the hand-spray operation during the piling is carried out only for the Mestha X Grade.

- Cuttings are mixed, coming partially from the other processing cycles, (already emulsioned and piled) and partially from the warehouse(dry ones, to be completely processed). This will result in uneven application of oil and water: moreover the piling process will not be a correct one, with low rises in temperature and therefore with bad fermentation.

  We should remember that this batch is formed by the lowest degrees of jute, and as a consequence it should be processed with particular care.

5-A) Productivity Team Proposals:

Our main advice is as follows:-

1) Cancel the hand-spray operation during the piling , either for adding only water either for adding water and emulsion.

   We think it will be more advisable to adjust the application of oil and water directly on the machines, in connection with the different grades of jute.

2) Cutting the roots should be the first operation in the processing cycle (See Annex 24).

   In this way we will avoid to mix already processed cuttings with dry ones and the piling will result a correct one.

- Finally we have to take into proper account an important and interesting problem.

  We already expressed to mill management the opinion that, by cutting the roots after the piling, a higher percentage of soft jute will be achieved.

  Our Teamcounterparts run a special test (See Annex 25): from the result it is possible to remark that , from the same degree of jute we got 35.83% of cuttings, when the cutting operation is performed before the piling, and 23.84% of cuttings,when the cutting operation is performed after the piling.

- Of course, these results could vary in connection with the quality of raw jute and to the experience of the workers appointed to the cutting operation.

- Anyway, on the grounds of the results of the test, we have quantified the 2 different processing cycles and we have calculated the differences between them, supposing to process the same quantity of raw jute (See Annex 26).

- There is no need to comment the final results. It is our opinion that the small saving following the higher percentage of soft jute achieved is abundantly balanced by the higher costs in the processing working loads, wastages, etc. This without taking in account the techinical considerations already expressed in the previous chapter.

6) Final Comment:

   - The Productivity Team is quite aware of the interest and the co-operation shown by the Mill Management.

   - The Productivity Team is also aware that the above advice requires a better supervision, both from quality and from quantity side, particularly for the first working steps of the process. We know that there are gaps in the staff, particularly for the first stages of the process.

- The Productivity Team is at the disposal of the Mill Management to supply all possible help to overcome the problems which have arisen in the Report and those which will be submitted by the Mill Management itself.

----

borghi e baldo ingg.
s.p.a.

ANNEX 1

CHITTAGONG JUTE MANUFACTURING CO.,LTD

STANDARD MORRAH WEIGHT

Dated 12.9.1979

Quality of Jute		Assorting Center	Standard Weight in lbs.
Cut Jute for C.B.C	BTB-BWB Mestha B.Bottom(Cut) BTC-BWC Mestha C.Bot (Cut) BTD-BWD - X	JUTE GODOWN	2 lbs to 2.5 lbs.
Uncut Jute	TB/Bot,WB/Bot,MB/Bot TC/Bot,WC/Bot,MC/Bot TX/Bot,WX/Bot.	Inside the Batching Department	2 lbs to 3 lbs.
Mill No. 1 and 2	S.M.R. Mestha- X Tossa Rejection.	Inside the Batching Department	1.75 lbs to 2.25 lbs.

Sd/-
Sr.Quality Control Officer
14.9.1979

Sd/-
Manager(P)
14.9.1979

Counterpart
13.9.1979

borghi e baldo ingg.
s.p.a.

ANNEX 2/A

CHITTAGONG JUTE MANUFACTURING CO.LTD.

DRY JUTE MORRAH TEST

STANDARD WEIGHT - 2.5 LBS.

RANGE - 3.00 - 3.00 LBS.

Dated 12.9.1979

Mofizur Rahman, T/No.107 A/S				Chanu Mia, T/No.19 A/S.			Md.Hanif, T/No. 6329 A/S.		
Quality-W.X.Bot (Mill No.1)				Quality-W.C.Bot (M-I)			Quality-W.C. Bot (M-II)		
Sl. No.	Morrah weight in lbs.	Total Morrah	% Between Range	Morrah weight in lbs	Total Morrah	% Between Range	Morrah weight in lbs	Total Morrah	% Between Range
1.	2.25 lbs			2.25 lbs			2.25 lbs		
2.	2.12 lbs			2.62 lbs			2.37 lbs		
3.	3.12 lbs			2.62 lbs			2.56 lbs		
4.	2.75 lbs			2.56 lbs			2.44 lbs		
5.	2.25 lbs			2.44 lbs			2.37 lbs		
6.	1.87 lbs			2.94 lbs			2.56 lbs		
7.	2.50 lbs			2.44 lbs			2.44 lbs		
8.	2.75 lbs			2.50 lbs			2.50 lbs		
9.	2.62 lbs	25	92%	2.44 lbs	25	96%	2.44 lbs	25	96%
10.	2.37 lbs			2.75 lbs			2.56 lbs		
11.	2.44 lbs			3.12 lbs			2.44 lbs		
12.	2.37 lbs			2.62 lbs			2.81 lbs		
13.	2.50 lbs			2.75 lbs			2.75 lbs		
14.	2.37 lbs			2.94 lbs			2.62 lbs		
15.	2.52 lbs			2.87 lbs			3.12 lbs		
16.	2.81 lbs			2.50 lbs			2.94 lbs		
17.	2.37 lbs			2.37 lbs			2.56 lbs		
18.	2.56 lbs			2.44 lbs			2.75 lbs		
19.	2.37 lbs			2.62 lbs			2.81 lbs		
20.	2.81 lbs			2.25 lbs			2.75 lbs		
21.	2.62 lbs			2.91 lbs			2.50 lbs		
22.	2.44 lbs			3.25 lbs			2.56 lbs		
23.	2.25 lbs			2.87 lbs			2.62 lbs		
24.	2.37 lbs			2.87 lbs			2.56 lbs		
25.	2.50 lbs			2.25 lbs			2.75 lbs		

Sd/-
Sr.Q.C. Officer,
14.9.1979

Sd/-
Manager (P)
14.9.1979

Sd/-
Counterpart
13.9.1979

borghi e baldo ingg.
s.p.a.

ANNEX 2/B

CHITTAGONG JUTE MANUFACTURING CO.LTD.

MORRAH WT. TEST REPORT

Std. Weight - 2 lbs. to 3 lbs
Quality - W.X. Bottom (Uncut)

Name : J.Ahmed, 156C Mill No. 1		A. Taher - 476C Mill No. 1		A. Rashid - 346C Mill No. 1	
Sl. No.	Wt.in lbs.	Sl. No.	Wt. in lbs.	Sl. No.	Wt. in lbs.
1.	2.12 lbs	1.	2.44 lbs	1.	2.50 lbs
2.	1.75 lbs	2.	2.20 lbs	2.	2.44 lbs
3.	2.62 lbs	3.	2.56 lbs	3.	2.80 lbs
4.	2.75 lbs	4.	2.30 lbs	4.	2.50 lbs
5.	2.50 lbs	5.	2.62 lbs	5.	2.55 lbs
6.	2.50 lbs	6.	2.37 lbs	6.	1.88 lbs
7.	2.20 lbs	7.	2.20 lbs	7.	2.80 lbs
8.	2.25 lbs	8.	3.00 lbs	8.	2.56 lbs
9.	2.20 lbs	9.	2.62 lbs	9.	2.37 lbs
10.	2.56 lbs	10.	2.44 lbs	10.	2.88 lbs
11.	2.20 lbs	11.	2.62 lbs	11.	2.69 lbs
12.	2.30 lbs	12.	2.81 lbs	12.	2.56 lbs
13.	2.25 lbs	13.	2.62 lbs	13.	2.70 lbs
14.	2.56 lbs	14.	2.19 lbs	14.	2.25 lbs
15.	2.12 lbs	15.	2.80 lbs	15.	2.56 lbs
16.	2.25 lbs	16.	2.75 lbs	16.	2.50 lbs
17.	2.50 lbs	17.	3.37 lbs	17.	3.12 lbs
18.	2.56 lbs	18.	2.75 lbs	18.	2.37 lbs
19.	2.56 lbs	19.	2.50 lbs	19.	2.80 lbs
20.	2.81 lbs	20.	2.56 lbs	20.	2.94 lbs
21.	2.56 lbs	21.	2.50 lbs	21.	2.62 lbs
22.	2.25 lbs	22.	2.80 lbs	22.	2.69 lbs
23.	2.44 lbs	23.	2.50 lbs	23.	2.00 lbs
24.	2.20 lbs	24.	2.12 lbs	24.	2.44 lbs
25.	2.25 lbs	25.	2.80 lbs	25.	2.50 lbs
4% out of Standard		4% out of Standard		8% out of Standard	

Sd/-
M.A. Jalil
Counterpart

borghi e baldo ingg.
s.p.a.

ANNEX 2/C

CHITTAGONG JUTE MFG. CO. LIMITED

HORRAH WT. TEST REPORT   Date: 21.9.1979

Standard weight = 2 Ibs. to 2.5 Ibs.
Quality = W.C.Bottom (Cut) for C.B.D.

SL.No.	Wt.in lbs.	SL.No.	Wt. in Ibs.	SL.No.	Wt.in Ibs.
1	2.81 Ibs.	18	1.87 Ibs.	35	2.75 Ibs.
2	2.12 "	19	2.50 "	36	2.75 "
3	1.62 "	20	3.06 "	37	3.75 "
4	3.50 "	21	2.37 "	38	2.50 "
5	2.75 "	22	2.19 "	39	2.44 "
6	2.00 "	23	4.12 "	40	2.37 "
7	2.25 "	24	3.75 "	41	2.25 "
8	3.75 "	25	2.06 "	42	2.31 "
9	2.44 "	26	1.62 "	43	1.56 "
10	4.31 "	27	2.19 "	44	2.31 "
11	3.12 "	28	2.06 "	45	2.25 "
12	2.00 "	29	1.25 "	46	2.62 "
13	2.25 "	30	3.37 "	47	2.00 "
14	2.44 "	31	2.50 "	48	2.37 "
15	1.75 "	32	3.25 "	49	2.12 "
16	2.06 "	33	3.62 "	50	2.50 "
17	2.00 "	34	2.44 "		

Remarks : 44% out of standard weight.

S/-
M.A.Jalil
Counterpart
UNDP/UNIDO Project

borghi e baldo ingg.
s.p.a.

ANNEX 2/D

CHITTAGONG JUTE MFG. COMPANY LTD

DATE : 29.9.1979

MORRAH WEIGHT TEST REPORT

Quality of Jute : W/L.X Bottom (Uncut)/SMP
Standard weight : 1.75 lbs – 2.25 lbs.

Sl.No.	Wt.in lbs	Sl.No.	Wt.in lbs.	Sl.No.	Wt.in.lbs.	Sl.No.	Wt.in lb
1	2.12 lbs	26	2.12 lbs	51	2.00 lbs	76	2.19 lbs
2	2.00 "	27	2.56 "	52	2.19 "	77	1.62 "
3	2.50 "	28	2.25 "	53	2.25 "	78	2.00 "
4	2.12 "	29	2.69 "	54	1.50 "	79	2.19 "
5	2.25 "	30	2.25 "	55	2.25 "	80	1.69 "
6	1.62 "	31	2.19 "	56	2.12 "	81	2.00 "
7	2.19 "	32	2.75 "	57	2.19 "	82	2.00 "
8	2.56 "	33	2.19 "	58	1.81 "	83	1.50 "
9	2.06 "	34	1.50 "	59	1.44 "	84	2.00 "
10	1.56 "	35	1.94 "	60	1.75 "	85	2.12 "
11	2.12 "	36	1.56 "	61	2.81 "	86	2.75 "
12	2.62 "	37	1.94 "	62	1.94 "	87	2.25 "
13	2.19 "	38	1.75 "	63	1.94 "	88	2.12 "
14	1.94 "	39	1.62 "	64	2.75 "	89	2.81 "
15	1.59 "	40	2.25 "	65	2.00 "	90	2.25 "
16	1.94 "	41	2.19 "	66	2.12 "	91	2.12 "
17	2.75 "	42	2.25 "	67	2.19 "	92	2.50 "
18	2.06 "	43	1.75 "	68	2.00 "	93	2.06 "
19	2.69 "	44	1.81 "	69	2.62 "	94	2.25 "
20	2.19 "	45	1.62 "	70	2.25 "	95	2.69 "
21	2.69 "	46	2.81 "	71	2.19 "	96	2.19 "
22	2.19 "	47	1.75 "	72	2.25 "	97	2.12 "
23	2.62 "	48	1.56 "	73	2.81 "	98	2.75 "
24	1.50 "	49	2.25 "	74	2.00 "	99	2.06 "
25	2.25 "	50	2.75 "	75	2.25 "	100	2.25 "
44% out of std.		40% out of std.		24% out of std.		32% out of std.	

Remarks: 35% out of std.

Sd/-
UNDP Counterpart
in CJMCL.

CHITTAGONG JUTE MILLS
MORRAH WEIGHT

ANNEX 3

Date	Name	Quality	Standard weight	No.of Tests	Highest	Lowest	Range	Below Std.	Within Std.	Above Std.	Average lbs/morrah	S.D.	C.V.%
12.9.79	Mofizur Rahman	W.X.Bot	2-3 lbs/M	25	3.12	1.87	1.25	1	23	1	2.5	0.27	10.66
12.9.79	Chanu Miah	W.C.Bot	-do-	25	3.25	2.25	1.00	-	23	2	2.65	0.27	10.27
12.9.79	Md.Hanif	W.C.Bot	-do-	25	3.12	2.25	0.87	-	24	1	2.60	0.20	7.55
12.9.79	-	-	-do-	75	3.25	1.87	1.38	1	70	4	2.58	0.25	9.75
19.9.79	J.Ahmed	W.X.Bot	-do-	25	2.81	1.75	1.06	1	24	-	2.37	0.24	9.96
19.9.79	A.Taher	W.X.Bot	-do-	25	3.37	2.12	1.25	-	24	1	2.57	0.29	11.25
19.9.79	A.Rashid	W.X.Bot	-do-	25	3.12	1.88	1.24	1	23	1	2.56	0.27	10.63
19.9.79	-	-	-do-	75	3.37	1.75	1.62	2	71	2	2.50	0.28	11.14
21.9.79	-	W.C.Bot (Cut)	2-2.5 lbs/m	50	4.31	1.25	3.06	6	28	16	2.52	0.68	26.86
29.9.79	-	W.L.X. Bot SKR	1.75-2.25 lbs/M	100	2.81	1.44	1.37	14	65	21	2.15	0.36	16.72

borghi e baldo ingg.
s.p.a.

ANNEX 4

PRODUCTIVITY TEAM PROPOSAL

(1) Due to the concrete impossibility of a general daily control on all the workers involved, we suggest a random daily checking. The workers who undergo the daily checking should be trained by the Department Supervisors, with the same method employed by our Team. Consequently, there should be a daily rotation of the workers subject to control, so that in a certain time unit all the workers involved will be undergoing the training stage.

(2) This control system should be assumed normal routine in every mill organisation.

(3) Then the departments situation will show a certain regular trend, it is up to the mill production Officers to take in right consideration the problem of the ratio between the morrahs weight and the Moisture Regain of raw jute.

(4) Consequently to point 2, in every morrah preparing department there should be at least two scales.

(5) We also recommend an unitary wages policy, so that all the workers of the department involved, regardless of mills and zone, will earn the same pay: this to avoid problems similar to those which arose in Platinum Jute Mills (See Report in Annex N°.6).

EMULSION BREAKING TEST REPORT

ANNEX 5

Name of the Mill : Chittagong Jute Mills

Type of Emulsifier Plant : Old Plant(Conventional)

Emulsifier used : Hostapol (diluted) from local market.

% of Emulsifier	Time taken for first breakage (in minutes).	% DECOMPOSITION					
		After 4 hours	After 8 hours	After 12 hours	After 16 hours	After 20 hours	After 24 hours
0.5	8	66	68	69	69.5	70	71
0.75	9	35	53	59	63	66	68
		EMULSIFIER USED : ISSAPOL					
0.5	8	71	74	–	–	–	74
0.75	9	64	67	–	–	–	67
1.0	11	61	65	–	–	–	66
		EMULSIFIER USED : SYMPHERONIC – N					
0.5	7	16	50	–	–	–	69

Annex 6/A

(C) CHITTAGONG JUTE MILLS: This mill has two emulsion plants = Rapisonic Plant and conventional old plant.
On Rapisonic Plant, with use of correct percentage of emulsifier for those plants (i/e.0.5%), the results are the same, using different emulsifiers or bought on local market (see Annex 5 -7): the percentage of decomposition after 24 hours was 24%.

On conventional old Plant, the results are very poor due mainly to a structural defect of the Plant itself : size of tanks is wrong, and so the number and the position of blades inside the main Tank. From Annex 8 it appears clearly that in this Plant no increased percentage of emulsifier modifies the final decomposition percentage, which looks almost stable.

(D) PLATINUM JUTE MILLS: This mill has a Rapisonic Plant for emulsion.
From Annex 9 - 10 it clearly appears that, only by using condensed water instead of river water normally used and not dilu-ting emulsifier before use, SAME results on final % decomposition are obtained decreasing the percentage of used emulsifier from 0.5% to 0.375%.

REPORT ON MECHANICAL CONDITIONS OF RAPISONIC PLANTS

In Annexes 12 -13 - 14 you will find a complete report on mechanical condition of Rapisonic Plants in the 3 Pilot Mills which are supplied with the same Plants.

borghi e baldo ingg.
s.p.a.

ANNEX 6/B

Mr.A.Hakim Miah
General Manager
Chittagong Jute Mill
Chittagong

Dear Sir,

During my last week visit at Chittagong Jute Mill, dated 9/5, I had a meeting, together with our counterparts, with Mr. F. Hossain, Mill Manager.

The points which arose during the meeting are as follows:-

A) Emulsion : Tests made with 0.5% and 0.75% Issapol (not diluted) with condensed water give the results of :

With 0.5% = 70 minutes first breakage
15% final decomposition
after 24 hours.

With 0.75% = 100 minutes first breakage
10% final decomposition
after 24 hours.

We remind you that using the same emulsifier with percentage 0.5% but with normal water, the results have been :
35 minutes first breakage
24% final decomposition
after 24 hours.

From these data you can easily assume the importance of using condensed water together with a nondiluted emulsifier.

Mr. F. Hossain agreed on these considerations and, due to the scarcity of condensed water, it was agreed by both of us to supply with the same at least the Rapisonic Plants.

B) For the Rapisonic Plants we took notice that the filters are now in proper order. For the old plant, confirming our opinion about the absolute inefficiency of the same, we took notice of your decision of making a new one on the scheme of the working of Dacca Jute Mill and we pointed out to your Manager that actually in the same mill we have as counterpart a mechanical engineer who will be able to give you all the required advice on the subject.

EMULSION BREAKING TEST REPORT

ANNEX 7

CHITTAGONG JUTE MILLS
NEW CONVENTIONAL PLANT

% of Emulsifier Nonidet P40	Time taken for first breakage (Minutes)	% DECOMPOSITION					
		After 4 hours	After 8 hours	After 12 hours	After 16 hours	After 20 hours	After 24 hours
0.125	43	3	4	-	6	-	7
0.250	65	2	3	-	4	-	5
0.375	90	1	1.5	-	3	-	4
ISSAPOL							
0.25	12	78	-	-	-	-	-
0.50	17	75	-	-	-	-	-

borghi e baldo ingg. s.p.a.

CHITTAGONG JUTE MILLS LTD ANNEX 8

EMULSION BREAKING TESTS

RAPISONIC PLANT

EMULSIFIER WATER	% of Emulsifier	Time taken for first breakage/min	% DECOMPOSITION						Date
			After 4 hours	After 8 hours	After 12 hrs	After 16 hrs	After 20 hrs	After 24 hours	
ISSAPOL NORMAL WATER	0.25	39	11	20	-	34	-	-	14.9.79
	0.50	65	4	8	-	11	-	17	1.10.79
	1.00	70	3	7	-	10	-	15	20.9.79
ISSAPOL CONDENSED WATER	0.50	70	4	10	-	12	-	15	27.4.79
	0.75	100	5	5	-	8	-	10	30.4.79
NONIDET P40 NORMAL WATER	0.5	80	3	4	-	5.5.	-	8	7.6.79
CONDENSED WATER	0.5	100	2	3	-	5.0	-	7	7.6.79

V/29

ANNEX 9

FINAL ADVICE

(1) Our first advice is to send an explicative Circular to all the mills involved on the Project. Circular which will assert once and for all the stability concept and the manner to detect the same in a simple and empirical way (see page 2 of general Notes).

(2) All new products employed should be previously tested on a quality basis (see Pg.4 of General Notes).

(3) The supply of Jute Batching Oil and emulsifiers should be made in a Centralised way by BJMC, with consequent reduction of costs, and time supply and more safety on the quality of products supplied.

(4) Standard characteristics of Jute Batching Oil for Bangladesh should be worked out (see Page 5 of Report).

(5) General advice should be given to all the mills to use condensed water : mechanical officers in each mill are quite able to study, for each mill, the possibility to draw pipelines from dressing department to emulsion plants. Cost for this work appears trifling in ratio to results which can be achieved.

(6) Emulsifiers employed could be various, the important thing is they should be well known ones and original (i.e. imported ones or if bought on local markets of good quality). Percentages of employ can vary accordingly, the main problem is to take advice from Company maker: those percentage should be changed only after results taken from Tests, which should be carried out by a Technical Institute (see our proposal on page 6 of the Report).

Normal percentages are 0.5% for Rapisonic Plant and 1% for Conventional Plants.

......./

(7) Temperature control during composition of emulsion should become normal routine for mill staff in Charge.

(8) For Papisonic Plants, it should be strongly recommended not to dilute previously the emulsifier in water : this will affect its chemical composition with the result of a lower impact in the emulsifier action. Moreover, for this type of Plant, which implies a % of employ of emulsifier lower that conventional plants, a correct mechanical control should be carried out as normal routine of mill maintenance : the cost for replacing spare parts on those plants is absolutely not comparative with the results which can be obtained by a proper working condition of the same Plants.

(9) For Conventional Old Plants, it should be recommended to control the right position of blades in the principal Tank to avoid the possibility of a vacuum between the bottom of the tank and the first blade, vacuum which possibly could be filled with emulsifier (first agent to be put in Tank) which therefore will not be affected by the rotating movement of blades during emulsion composition process.

borghi e baldo ingg.
s.p.a.

2.B) Productivity Team Proposals.

- The Productivity Team has already produced on the 3rd of May a general report on this subject with different remarks and proposals.
- We enclose copy of pages 10/11 of the Report (See Annex 5A-5B) with our general proposals.
- We enclose copy of Annex 9 and 10 of the same general Report (See Annex6) with the results of the tests run at Platinum Jute Mills.
  In particular, for Platinum Jute Mills, we recommend :

  A) the use of condensed water: tests run at Platinum, as in the other Pilot Mills, clearly point out the increase on stability time of emulsion, using softened water. In our opinion, as it shows from Annex 5, this increase can be estimated in about 40% = this is already a remarkable achievement.

  - However the problem of water is a bigger one than one normally could think about; its correct solution can affect all the process efficiency, therefore costs and economical budgets of the mills.
  - We would like to recall that, as far as we know, none of the Jute Mills in Bangladesh areprovided with a plant of water softening.
  - All the boilers are fed with water from the subsoil or from the rivers; the same water is utilised for emulsion and starch making.
  - No analysis of the water utilised in the mills is carried out , but in our opinionneither the high grade of hardness nor the impurities present make the same unsuitable for industrial purposes.
  - This is particularly true for the Khulna Zone, well known for the low quality of its water.
  - We would like to point out that modern softening water plants (with ions exchange resins) are available at relatively low cost, with minimum cost of service and easy maintenance. The only foreseeable maintenance cost is the periodical replacement of the exhausted resins.
  - On the other hand the Q.C.Labs,at least in the Pilot Mills, are already equipped with PH meters, that's why the foreseeable accessory costs insignificant.

...../

- To come to the point it is our opinion that equipping Platinum Jute Mill with a proportioned water softening plant, will be an investment cheap in cost but excellent in results.
- The main advantages should be :
  a) a better and more stable emulsion
  b) a better starch(due to the increased solubility of different products in water)
  c) higher efficiency in the boilers, with reduced consumption of fuel.
  d) less maintenance for the boilers and the auxiliary plants.

- Finally, last but not least advantage, the mill could use condensed water at certain temperatures(say about 40°C) for the final mixing with water at the metering units of the emulsion coming from Rapisonic Plants. In this way it will be possible to maintain high the stability time of emulsion un-till the moment of application and to apply emulsion to the fibre at about 40°C, increasing the penetration and starting in the meantime the piling process. This is particularly important for processing hard low costing fibres as Mestha, cuttings, etc.

B) <u>Correct use of emulsifier:</u> as is shown in Annex 4, the final proportion o emulsifier is about 0.5%.

- This proportion practically coincides with the advice for the Rapisonic Plant manufacturer.
- Nevertheless the stability time period is very low(see cap. 2A) and un-acceptable.
- The habit of previously diluting the emulsifier with water is helping to lower the stability period. Therefore (as already stated in point 2B - Annex 5) we recommend to use <u>undiluted emulsifier</u>.
- In Annex 7 are condensed our advice about the plant setting, the use and final proportion of emulsifier, the possibility of corrections.
  Finally:- follow the manufacturer instructions
  - use a good quality emulsifier, in the correct proportions
  - the final proportion should be increased if the stability peri is still too low.

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s.p.a.

ANNEX 11

Date 30th Oct'79

REPORT O N CONDITION OF METERING UNITS OF SOFTENER MACHINE OF MILL NO.1

1) The Mill No.1 C.J.M.C.L. is equipped with 7 softener machines.

All these 7 machines are equipped with Fraser metering units but not in operating condition.

The reason is that all the metering units are either without Solonide valves or that these valves are out of order : the Mill is trying to procure replacements from U. K.

I suggested that the Production Mgr and the Mill Engineer use, for the moment, the metering units without the solonide valves, because at least the emulsion application could be controlled with a certain accuracy. The only problem will be the control of wastage : for the moment and to some extent the machine operator should be so alert, when the machine stops, to close at once the metering unit and therefore to stop the dropp ing of emulsion. With the above system Mill No.2 and Carpet Backing Unit Softeners are already running.

2) A second problem concerns the use of Fraser Metering units in Mill No. 1.

Waste emulsion is used, by re-processing : as a consequence quite a number of jute fibres together with dust is coming through the delivery pipe. These fibres create jams at the delivery point i.e. on the metering units : flow ratio cannot be maintained properly.

Regarding the Conventional Plant, I have made the following remarks:

1) Waste emulsion is reprocessed with application of some percentage of fresh emulsifier and J.B.O, but the ratio or percentage of different elements cannot be maintained properly.

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Ref.___________ - 2 - Date 30th OCT 1979

2) After preparing the emulsion, the same is lifted by a pump to a 15 ft.high Tank for delivery. This system is not correct. This Tank cannot supply a constant flow as the delivery ratio will be different due to pressure difference when the Tank will be fully loaded or when the same will be half empty.

I suggest, for maintaing a constant ratio,the use of a pump for delivery side.

MAINTENANCE AND CLEANING OF SPINNING FRAMES

Mill No.1 is equipped with 91 Spinning frames. Six Spinning Frames are idle daily: (3 for cleaning
(3 for overhauling

plus 1 or 2 Spinning frames are idle for mechanical changes and breakages.

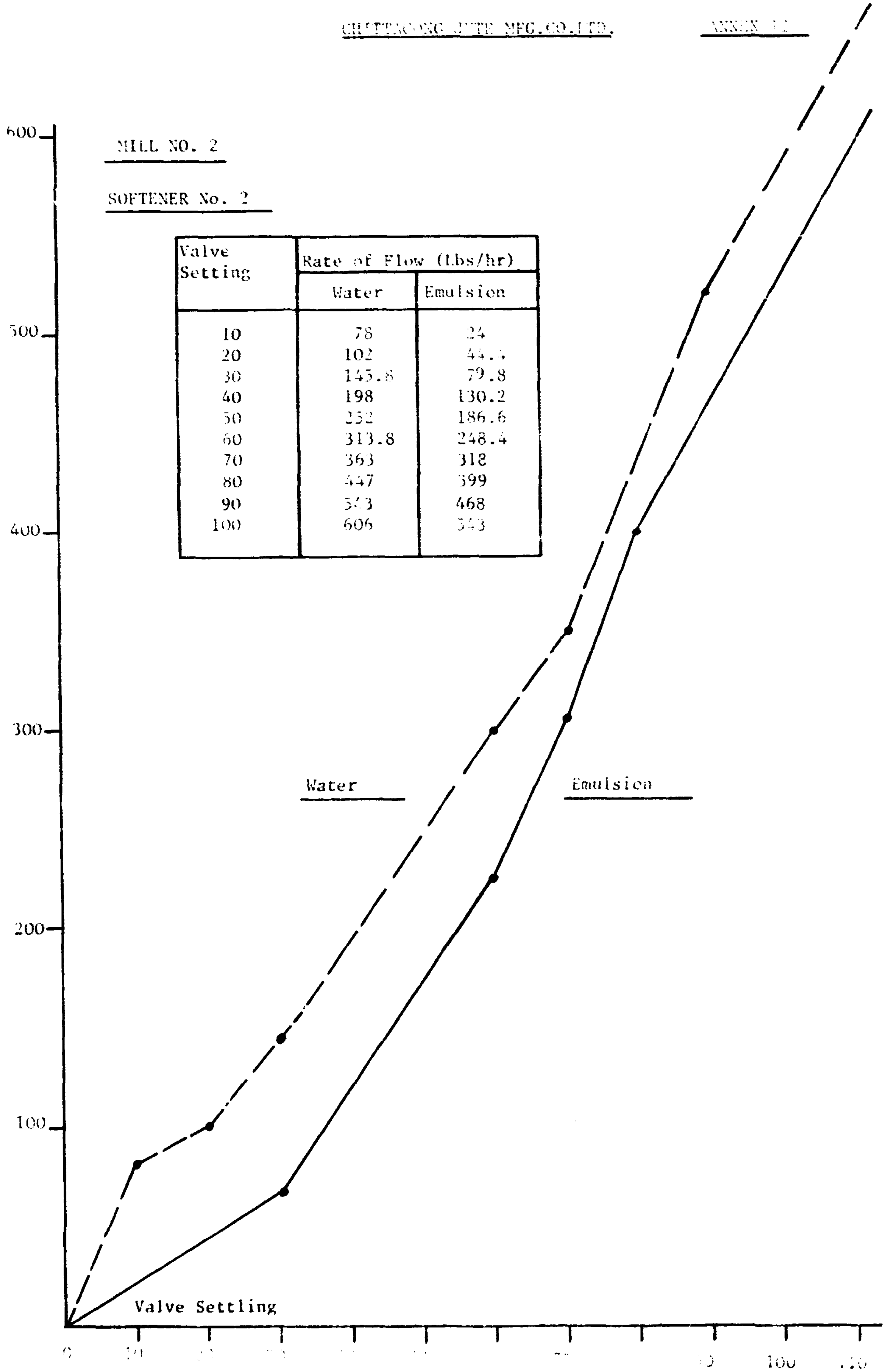
I suggest that, for cleaning, a team of 4 workers for each shift can easily clean 2 spinning frames : that means, by double shift a daily cleaning of 4 spinning frames. In this way all the spinning frames will be cleaned once a month (4 spinning frames x 6 days x 4 weeks = 96).

Sd/-(Md.Saleh)
UNDP/UNIDO Counterpart

MILL NO. 2

SOFTENER No. 2

Valve Setting	Rate of Flow (Lbs/hr)	
	Water	Emulsion
10	78	24
20	102	44.4
30	145.8	79.8
40	198	130.2
50	252	186.6
60	313.8	248.4
70	363	318
80	447	399
90	543	468
100	606	543



[illegible] 1	M/C No.	Motor R.P.M.	Feeding speed yds/min	Delivery speed yds/min	Ratio= $\frac{\text{Delivery}}{\text{Feeding}}$	1 Av.
1	1	720	27.3	33.6	1.23	
1	2	"	"	"	"	
1	3	"	"	"	"	
1	4	"	"	"	"	
1	5	"	"	"	"	
1	6	1455	17.2	25.5	1.48	
1	7	480	29.6	36.5	1.22	
2	1	710	27	33.2	1.22	
2	2	725	27.5	33.9	1.22	
CB[illegible]	/	/	/	/	/	
	2	735	27.9	34.4	1.23	

Assumed : Average lengt

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ANNEX 13

CHITTAGONG JUTE MFG. COMPANY LTD.

SOFTENER FEEDING

F E E D E R S			2 F E E D E R S		
Morrah/ in.	Av. Length fed yds/min	Av. Gap %	Av. Morrah/ min.	Av. Length fed yds/min.	Av. Gap %
9	15.1	45	12	20	26.6
9	15.1	45	12	20	26.6
9	15.1	45	12	20	26.6
9	15.1	45	12	20	26.6
9	15.1	45	12	20	26.6
/	/	/	/	/	Cuttin.
/	/	/	/	/	Cutting
9	15.1	44	12	20	26
9	15.1	45	12	20	27.1
/	/	/	/	/	/
9	15.1	46	12	20	28.1

h of the Morrah : 1.67 yards/morrah.

V/37

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ANNEX 14

CHITTAGONG JUTE MFG.CO.LTD.

EMULSION APPLICATION TEST

Date	Mill	M/C No.	Valve Setting		Flow Rate (Lbs/hour)			Emulsion Application %
			Emulsion	Water	Emulsion	Water	Total	
28.10.79	2	1	70	90	318	543	861	23.16
4.1.79	2	2	65	90	283	543	826	26.50
5.1.79	2	2	60	95	248	574	822	27.00
31.12.78	2	2	60	90	248	543	791	25.00
27. 5.79	2	2	60	90	248	543	791	22.00
27. 5.79	2	2	60	90	248	543	791	25.00
27. 5.79	2	2	60	90	248	543	791	24.00

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ANNEX 15/A

CHITTAGONG JUTE MFG.COMPANY.LTD.

AVERAGE EMULSION WASTAGE

1. Average daily production from Spinning Department.

	Mill No.1	60	Tons/Daily
	Mill No.2	18	" "
CBC	Mill No.	18	" "
	Total	96	" "

2. Estimated daily production from Softener M/C. — 96+25% = 96+24 = 120 Tons/Daily.

3. Daily working time of the softeners M/c: No.5 m/c working by 3 shifts 5 x 23.5 = 117.5 hours daily.

4. Average Production : $\frac{120}{117.5} = 1.02 \frac{\text{Tons}}{\text{hourxm/c}} = 1.02 \times 2240$

$= 2240.66 \frac{\text{lbs}}{\text{hourxm/c}}$

5. Assumed average application of emulsion. 25%

6. Average raw jute fed per hour and per m/c. $\frac{2287.66}{1.25} = 1830.13 \frac{\text{lbs}}{\text{hourx m/c.}}$

7. Assumed valve setting = Emulsion 60, Water 90

8. Flow Rate(see Annex 12) per m/c. = Emulsion 248 $\frac{\text{lbs}}{\text{hour}}$

Water 543 "

Total 791 $\frac{\text{lbs}}{\text{hour x m/c.}}$

9. Average emulsion applied = 0.25 x 1830.13 = 457.53 $\frac{\text{lbs}}{\text{hour x m/}}$

10. Average emulsion wastage per machine

$$\begin{array}{r} = 791.00 \\ \underline{457.53} \\ 333.47 \end{array} \quad \frac{\text{lbs}}{\text{hour x m/c.}}$$

11. Average percentage of emulsion wastage $= \frac{333.47}{791.00} \times 100 = 42.16\%$

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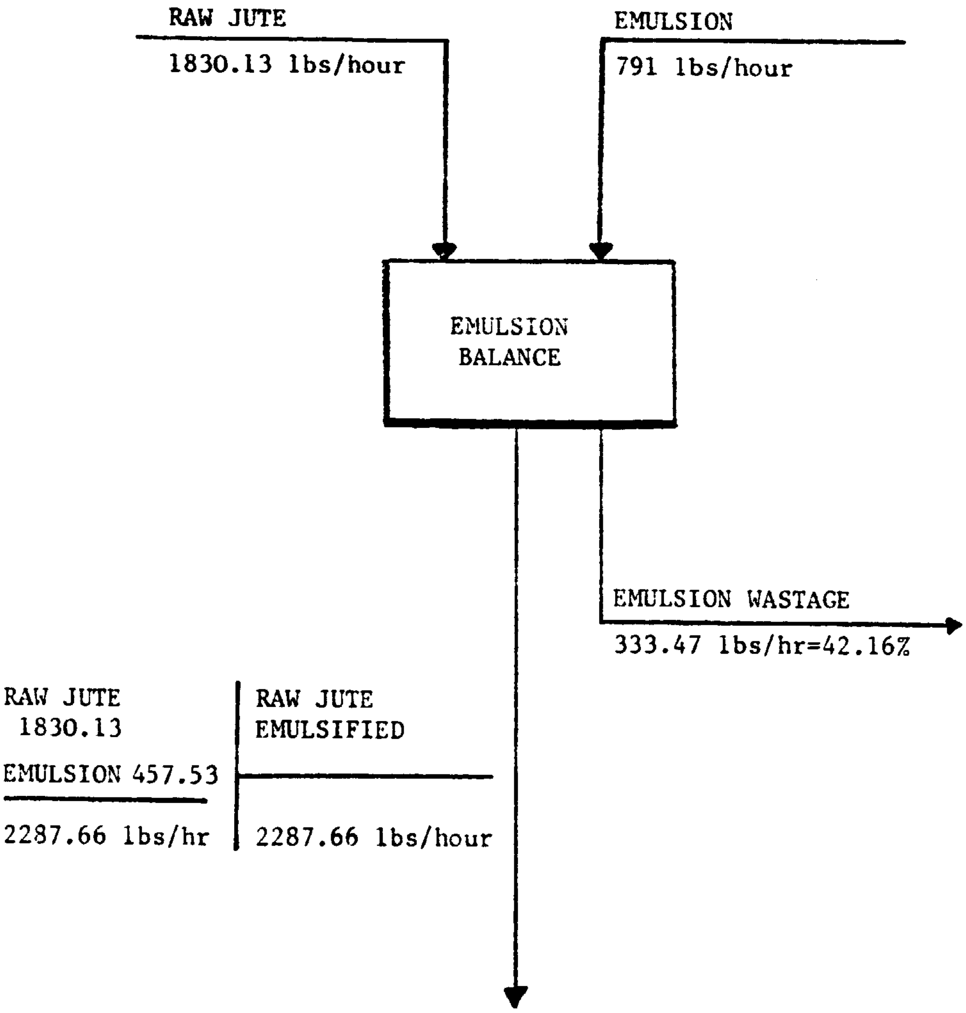
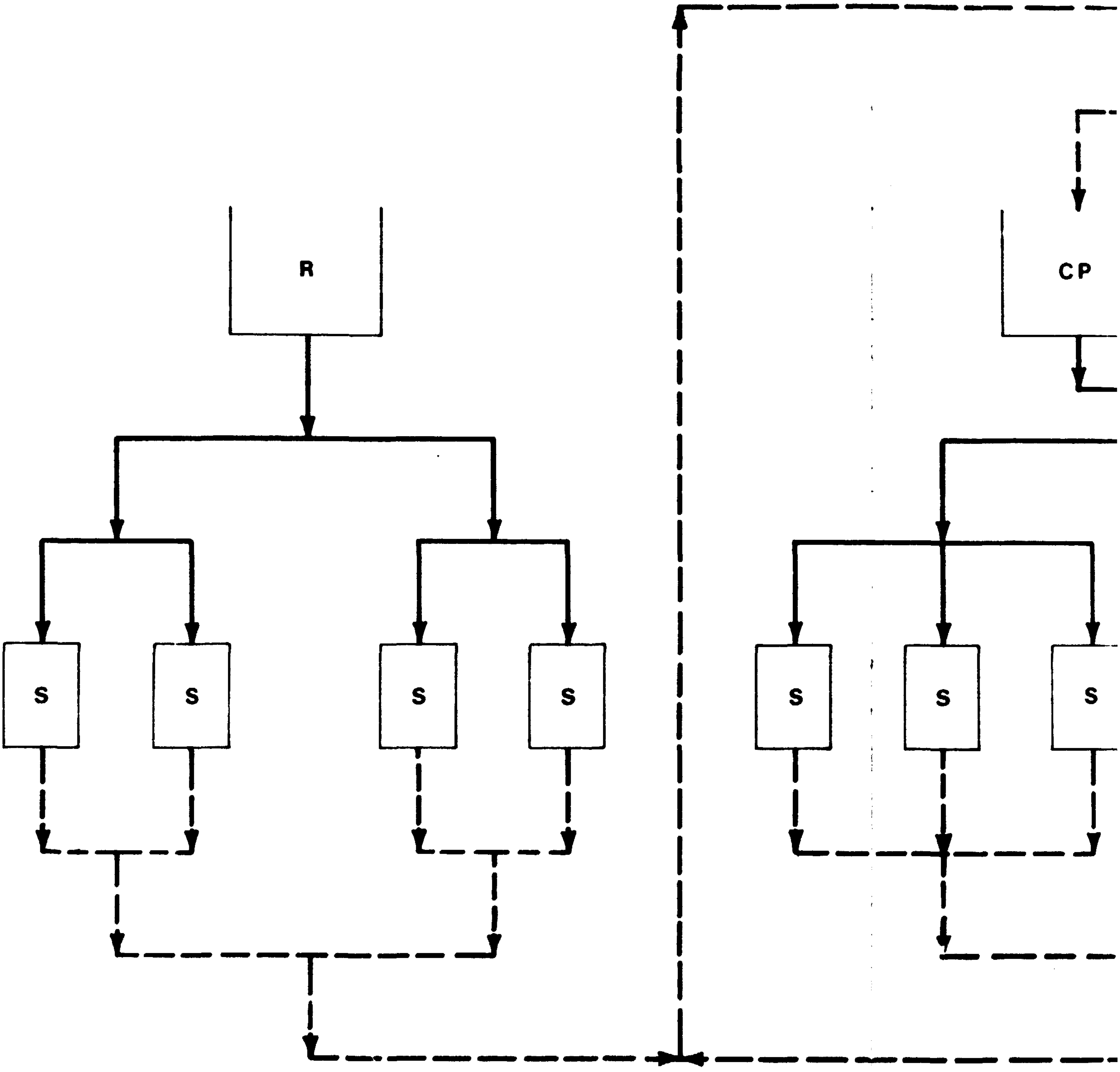
s.p.a.

ANNEX 15/B



CHITTAGONG JUTE MFG. COMPANY LTD.　　SKETCH OF WASTAGE

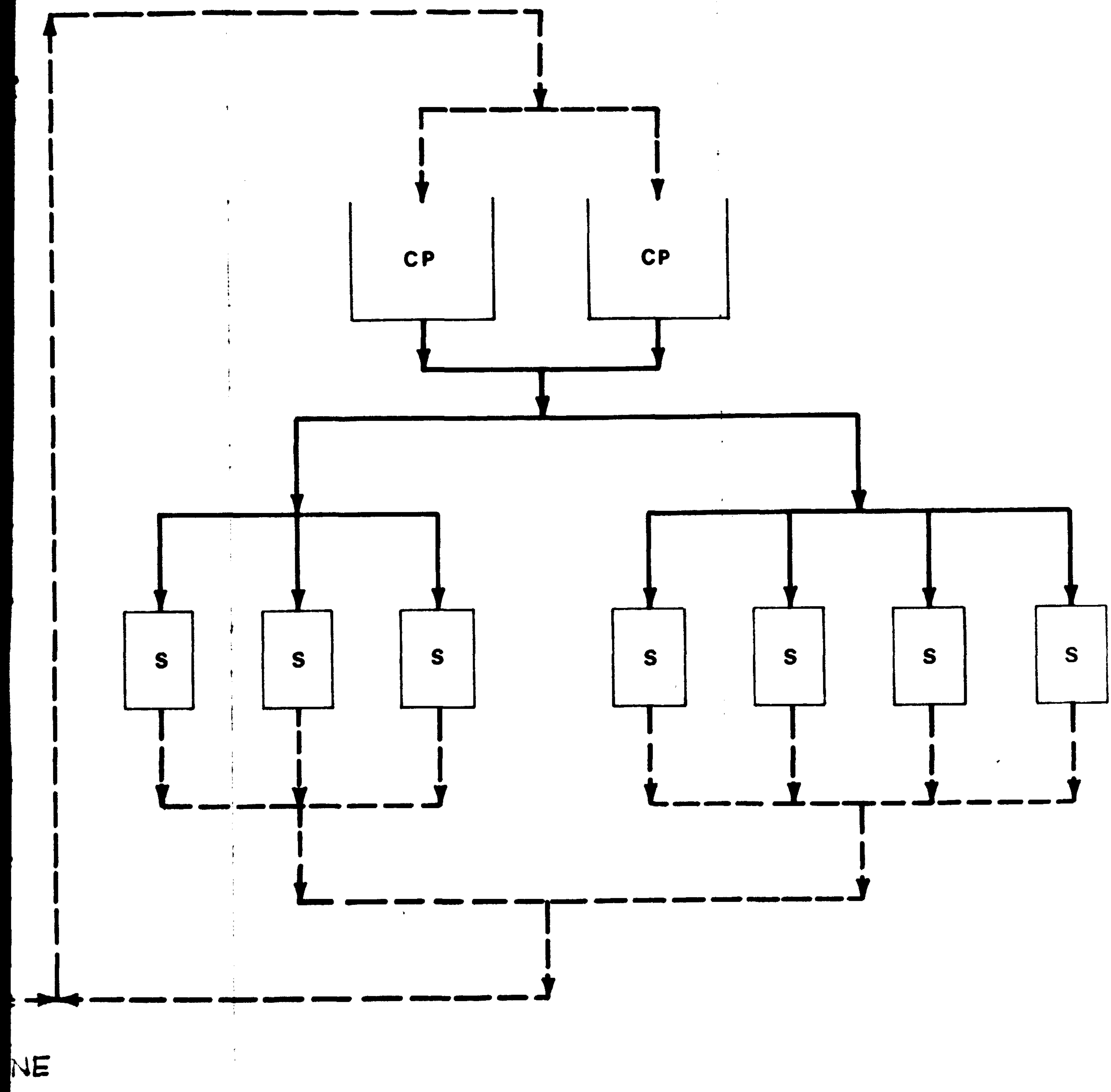


———	FRESH EMULSION LINE
– – –	WASTAGE LINE
R	RAPISONIC PLANT
S	SOFTENER
CP	CONVENTIONAL PLANT

SECTION 1

SKETCH OF WASTAGE EMULSION RECOVERY

ANNEX 16



SECTION 2

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ANNEX 17

TEAM ADVICE :

1) The workers assigned to the softeners feeding should be trained for a long period to a feeding rhythm the more uniform as possible.

2) The feeding speed of softeners should be proportional, as far as possible, to the average total length of the fibre which is going through the machine. In this way gaps will be reduced to the very least. As is shown clearly in the Annexes (1 to 4), a double feeder is essential, in all the mills.

It is worthwhile to remember that reducing gaps on the feeding cloth is one of the main factors to decrease emulsion wastages in softening process.

3) The delivery speed should be higher, in comparison to the feeding speed, by about 10-15%. In this way jumps will be reduced to the very least, with consequent improvement in the efficiency of the machine.

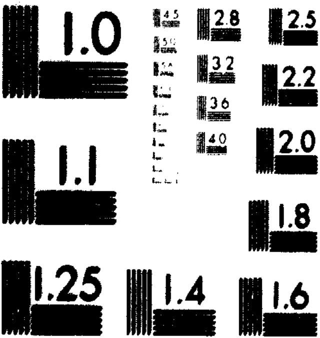
4) The percentage of oil, which should be applied to the fibre, should be predetermined. From this datum the percentage of oil in emulsion will be worked out, and consequently the flow of emulsion.

5) Flow Chart of emulsion, or emulsion and water, coming from the distribution valves should be recorded in every mill for each machine : the flow should be checked to control the constancy and continuity of the same with time. We will point out in this connection the need of accurate cleaning on the application plant (See Annex 5).

6) Once the distribution valves will be calibrated on the grounds of requirement, from time to time it should be checked if the quantity of emulsion applied is in conformity with the desired quantity. Only slight adjustments on the valves calibration will then be necessary to obtain the desired amount.

7) It should be remembered that the final purpose of emulsion application is to apply oil on fibre in the most uniform way and in the required quanti'

Some application systems checked in some mills are absolutely wrong and not economic (See Annex 8).



MICROCOPY RESOLUTION TEST CHART

NATIONAL BUREAU OF STANDARDS 1963 A

B - SPREADER

This type of machine was put into action in the Fifties and has in great measure replaced the older softeners.

This machine follows a different technological idea : instead of the mechanical work of weights and springs, to the fibre will be given a first course action of carding and drawing. By this we will reach a first cleaning of the fibre from wooden remains and an initial opening of the primary fibres, with beginning of the process of parallelising and reduction in section of the same fibres. All this will be reached passing the row fibre between 2 chains, a slow one and a fast one, provided with bars and coarse pins.

From the processing point of view, we think the spreader suitable for jute of a medium/high degree of quality. This machine, really, shows the following advantages in comparison to the old softeners.

- reduction in manual faults on feeding, during the following process steps (see carding process)
- better application of emulsion, with less wastages
- better piling, because it will be formed by compact rolls, obtaining in the meantime the result of a cut in the space needed for the operation, space often lacking in the mills lay-out.
- More productivity.

As a consequence, if the machine is running in a correct way, it is possible to obtain notable improvements in the regularity of all the following process and therefore, in productivity itself.

- Spreader, in spite of being a heavy machine, needs very careful maintenance : specially for chains, pin bars and roll formers; for this reason all these parts should be checked regularly and overhauled in proper time. Normally spare parts for spreaders are quite expensive : this can explain, but only in part, the trend, which we noticed in the mills, to neglect the maintenance. Simple technical-economical considerations can easily show that the money involved in the purchase of spare parts for spreaders will be quickly amortized by the higher production of the machine itself and by the drop of

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CHITTAGONG JUTE MFG. COMPANY LTD. ANNEX 19

OUTPUT OF SPREADER MACHINE

1. Delivery speed : 70 yds/min.

2. Sliver Weight : 60 lbs/100 yards.

3. Assumed Average Efficiency 50%

4. Production per hour/machine : $\frac{70 \times 60}{100} \times \frac{60 \times 0.5}{2240} = 0.562 \frac{\text{Tons}}{\text{hour x machine}}$

5. Daily working time/machine : 23.5 hours (3 shifts)

6. Daily production/machine : $0.562 \times 23.5 = 13.22 \frac{\text{Tons}}{\text{daily x machine}}$

7. Average daily production from spinning Department :

Mill No.2	18 Tons
CBC Mill	18 Tons
Total	36 Tons

8. Number of Required M/c. : $\frac{36}{13.22} = 2.72$ M/c.

9. Number of M/c. to be installed : 3 machines.

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ANNEX 20

CHITTAGONG JUTE MANUFACTURING CO.LIMITED

Study for the period from 27.2.79 - 27.3.79.

Quality of Jute	Average Jute Issue/Day in Tons	Stock of Piling Jute in Tons.	Avg.Spg. Prod./Day in Tons	Ratio between spg. prod. piling jute.
Long Jute	(38.52 Tons-Avg.Less-20% = 7.70 Tons Cuttings 30.82	173.84	33.90	1:5.13
Cuttings T.Waste Rope	(3.04+Avg.Add 20% = 7.70 Tons Cuttings from Long Jute) 10.74	146.46 63.35 1.13	12.90	1:11.35
TOTAL	41.56	384.88	46.80	

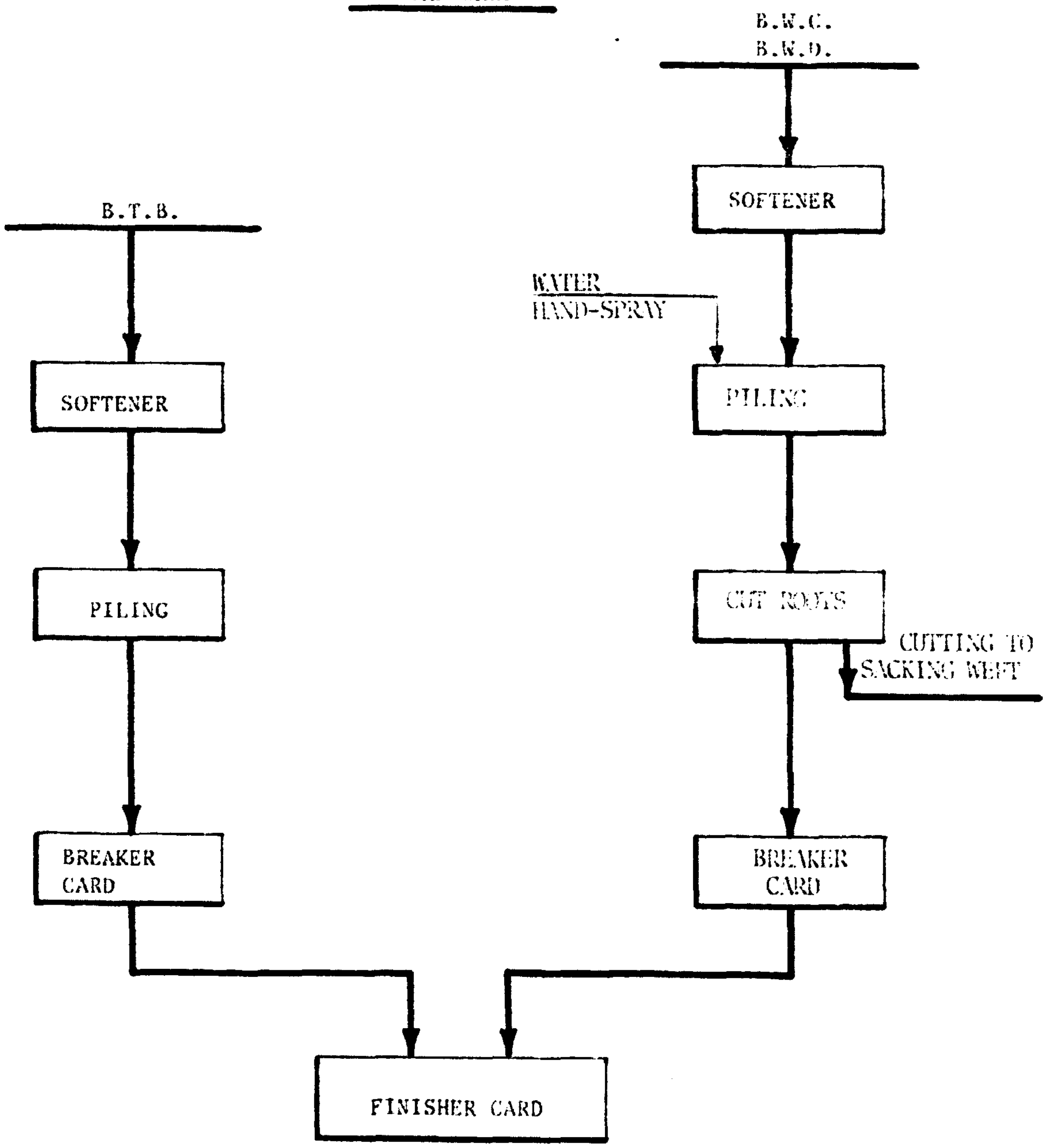
ANNEX 21

	e	Quality	1st Day		2nd Day		3rd Day		4th Day		5th Day		6th Day		7th Day		8th Day		9th Day		10th Day		REMARK
			M	A	M	A	M	A	M	A	M	A	M	A	M	A	M	A	M	A	M	A	
2(	2.78	W.C.Bot (uncut)		26°C										58°C									Mill No.1 Old Plant
22	2.78	W.C.Bot (uncut)		26°C										49°C									-do-
2	.79	-do-		31°C											61°C								-do-
2	.79	-do-		30°C													63°C						-do-
1	.79	.C.B(cut)		30°C										58°C									-do- 28% Application
	--	-do-		30°C								54°C											C.B.Plant, Appl. 26%
2	.79	W.X.Bot (uncut)		29°C									60°C										Mill No.1 Old Plant
1	.79	-do-		30°C														62°C					-do-
3	.79	W.X.B. (cut)		32°C										52°C									Mill No.2 Rapisonic
28	.79	W.X.Bot (uncut)	31°C																54°C				-do- Appl. 27% & Extra Water
9.	.79	-do-	31°C														50°C						No Extra Water Appl. 27.5%
3	.79	W/C.Bot. -do-		31°C												70°C							Mill No. 1 Old Plant
17	.79	White Cuttings		31°C																		67°C	Appl.35%.Oil in Jute 7%

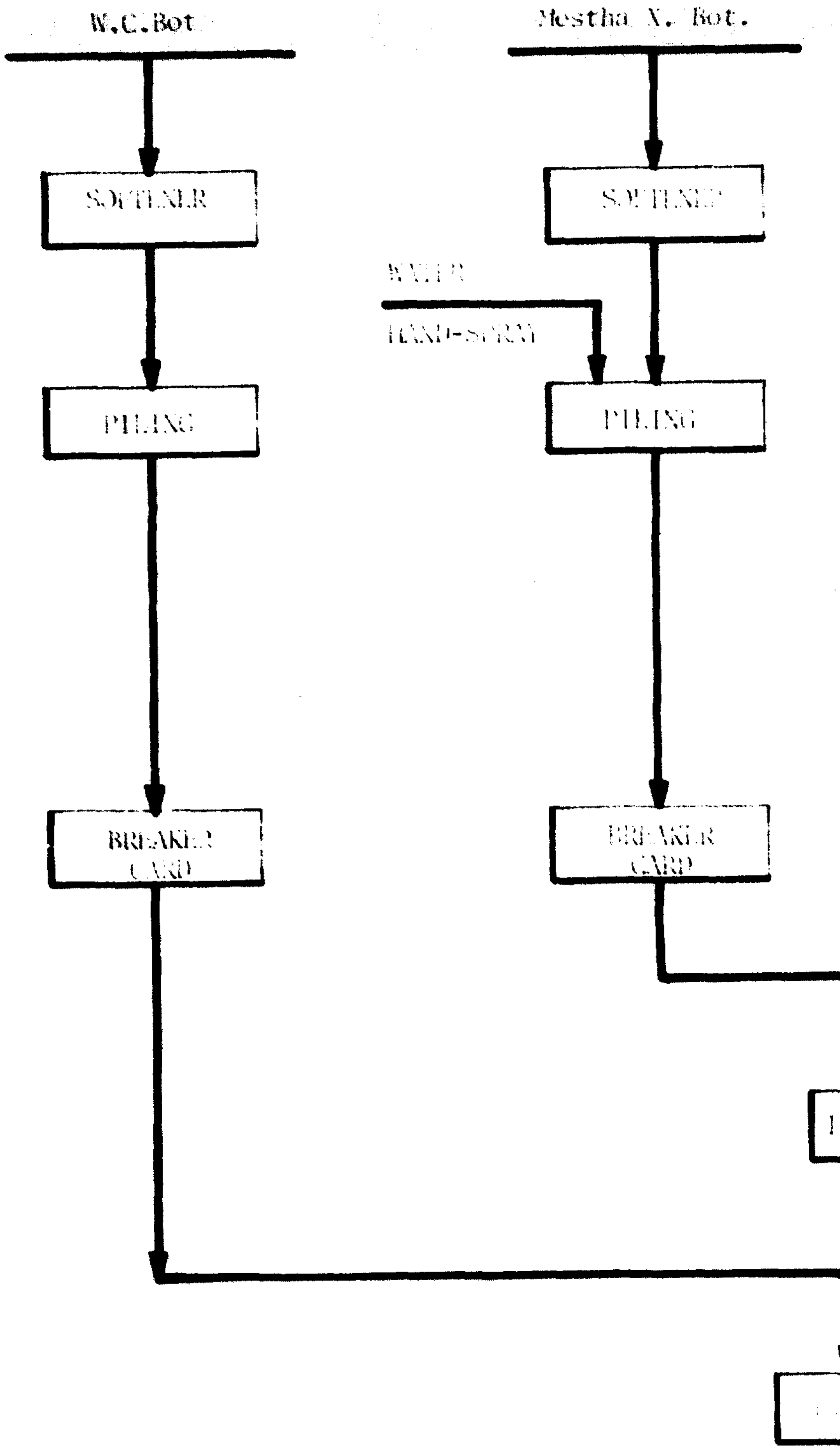
M Morning
A Afternoon
A.= Application.

ANNEX 22/A

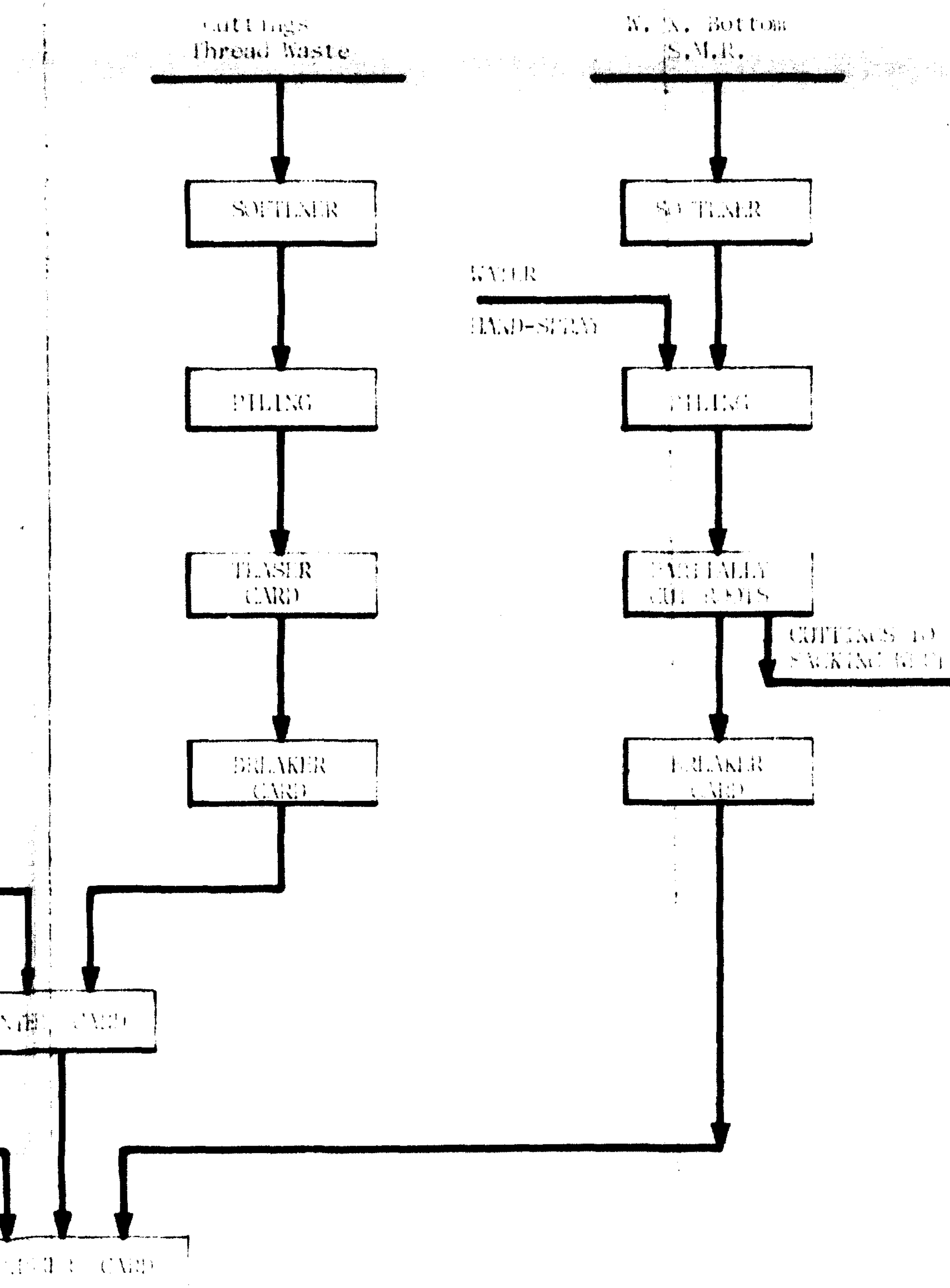
HESSIAN WARP

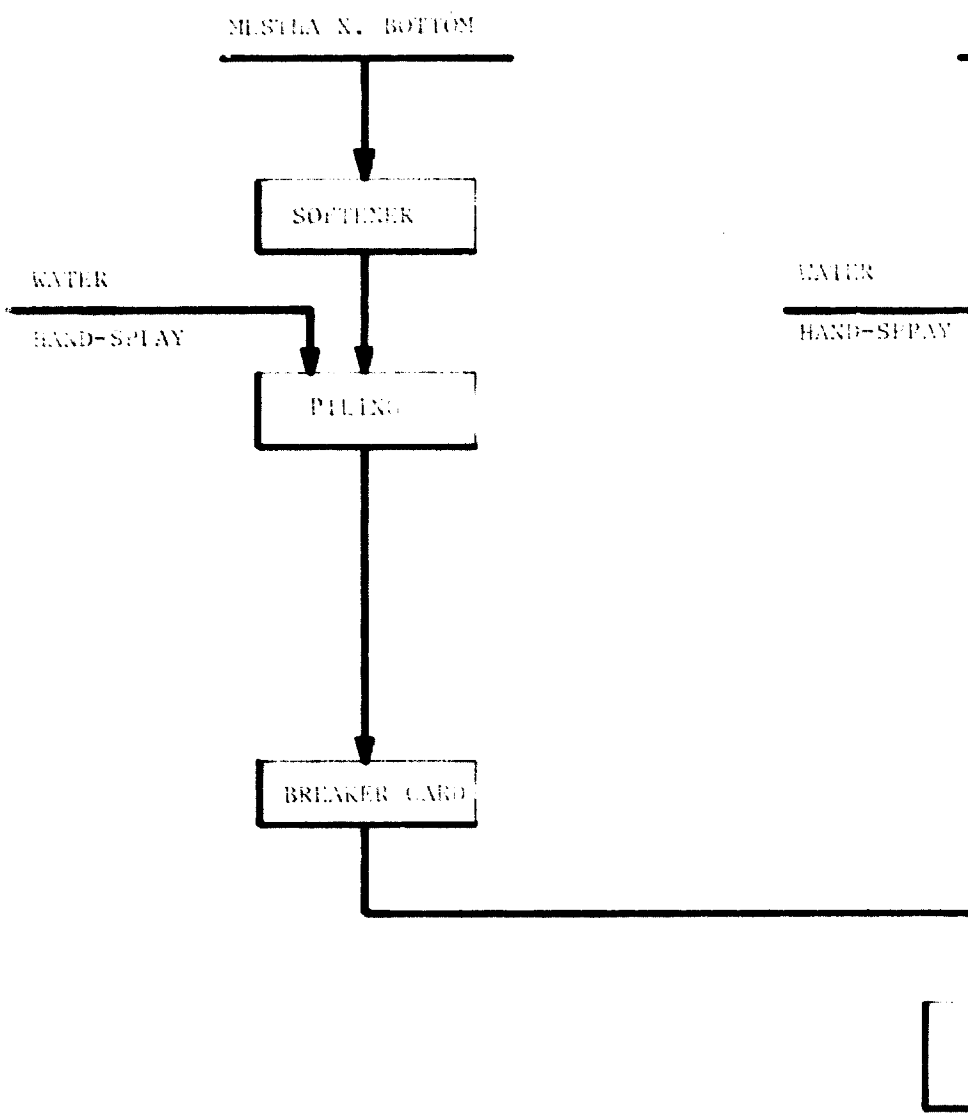


HESSIAN


W.C.Bot
Mestha X. Bot.
SOFTENER
SOFTENER
WATER
HAND-SPRAY
PILING
PILING
BREAKER CARD
BREAKER CARD

WEFT AND SACKING WARP

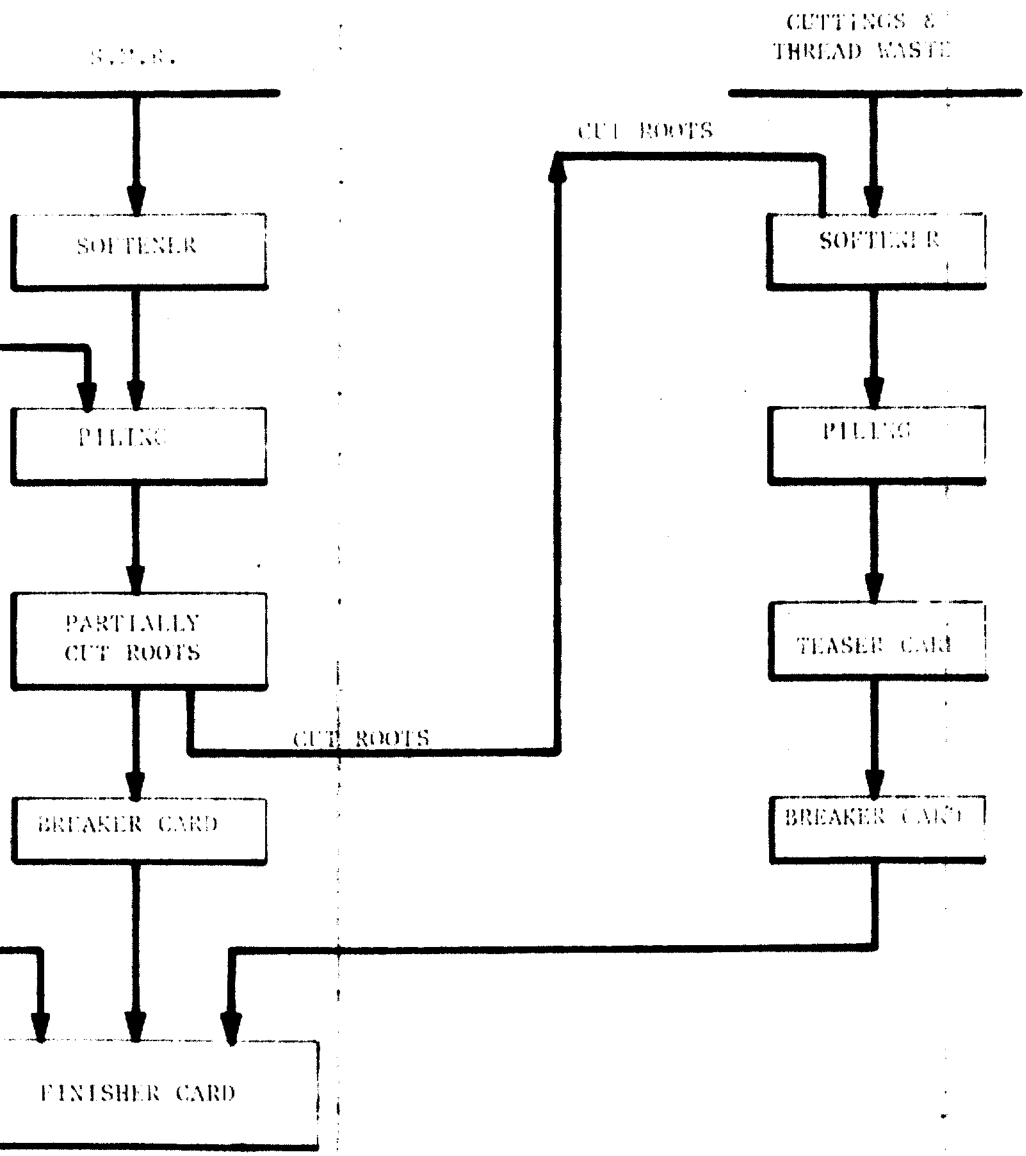




MESTHA N. BOTTOM
SOFTENER
WATER
HAND-SPRAY
PILING
BREAKER CARD
WATER
HAND-SPRAY

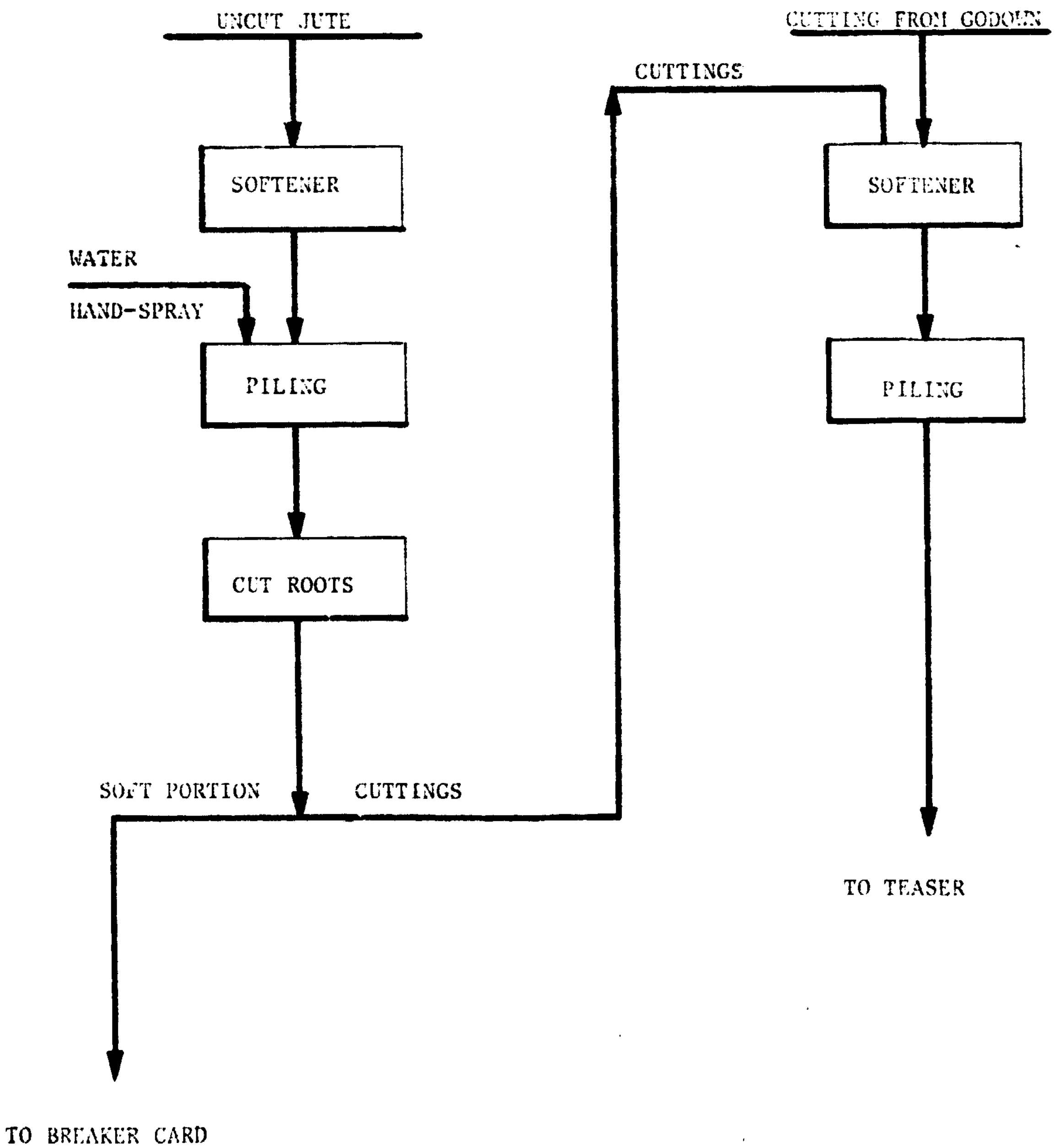
ANNEX 22/C

SACKING WEFT



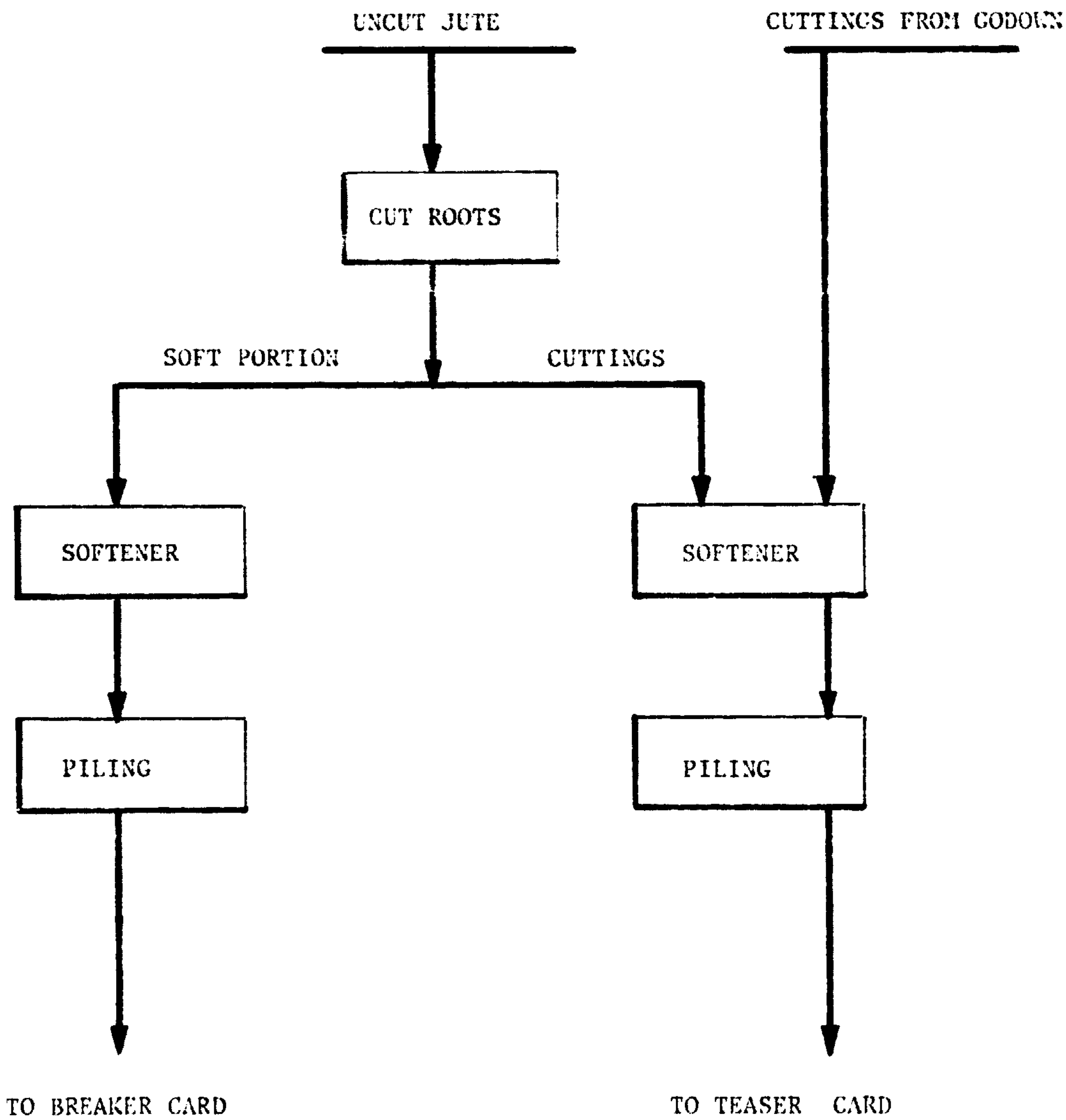
ANNEX 23

CUTTING PROCESS



ANNEX 24

CUT ROOTS PROCESSING PROPOSAL



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s.p.a.

ANNEX 25

CHITTAGONG JUTE MANUFACTURING COMPANY LIMITED

P.O. MOHARA, KALURGHAT, CHITTAGONG

COMPARATIVE TEST REPORT ON CUTTING PERCENTAGE

Quality: W. X. Bottom (Katcha bale of Lalmonirhat Agency)

Piled for : 120 Hrs. (5 days)

Temperature reached : 60°C

(1) Weight of uncut dry jute = 120 lbs.
Weight of cuttings = 43 lbs

$\therefore$ % of cuttings in dry jute = $\frac{43 \times 100}{120} = 35.83\%$

(2) Weight of emulsified uncut jute (after piling) = 156 lbs.
Weight of cuttings = 45 lbs.

$\therefore$ % of cuttings $\frac{45 \times 100}{156} = 28.84\%$

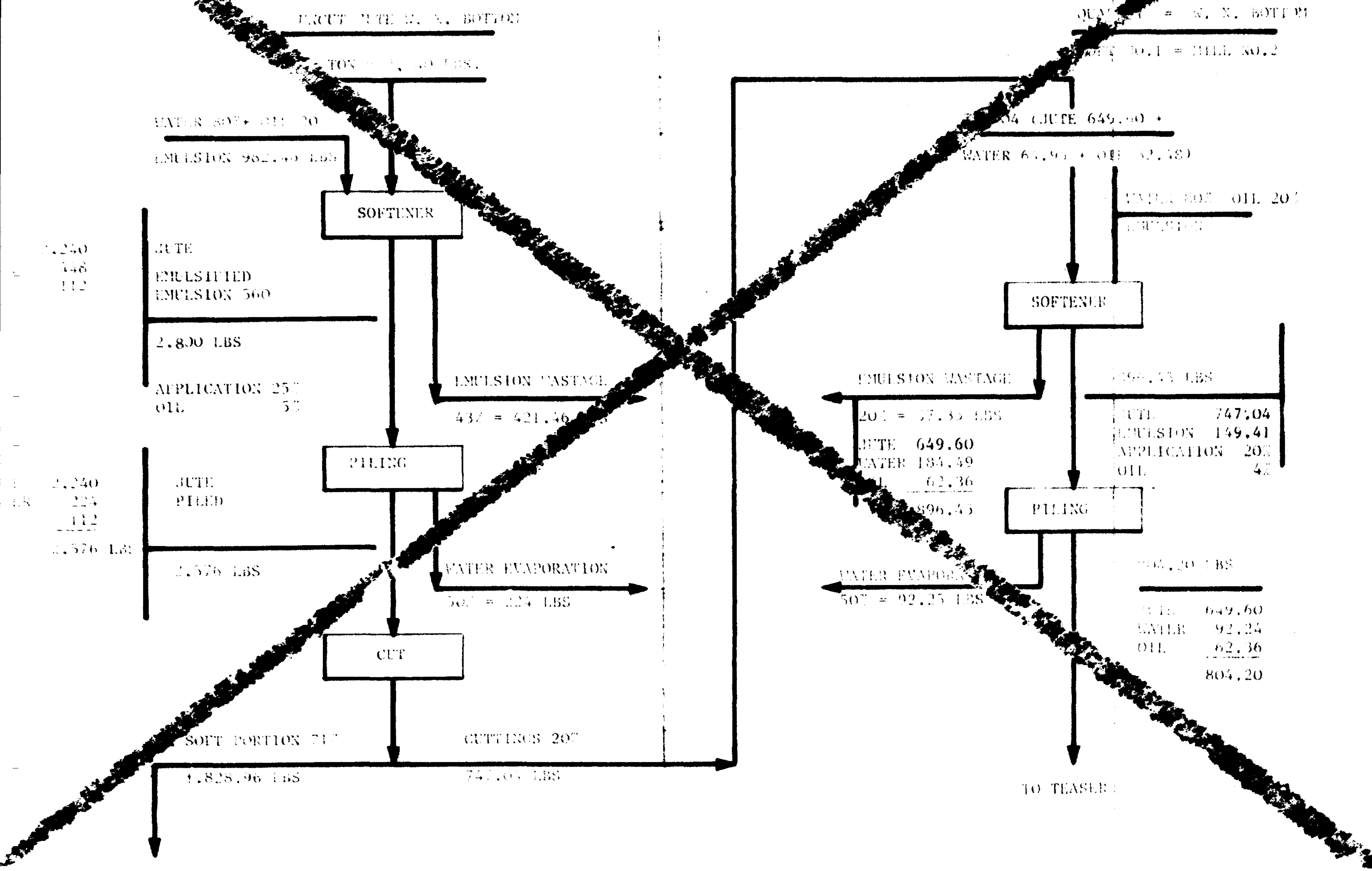
Counterpart
C.J.M.C.L.

30.10.1979

CHITTAGONG ACTUAL PROCESSING

DATA FROM TEST CARRIED OUT ON 28.10.79

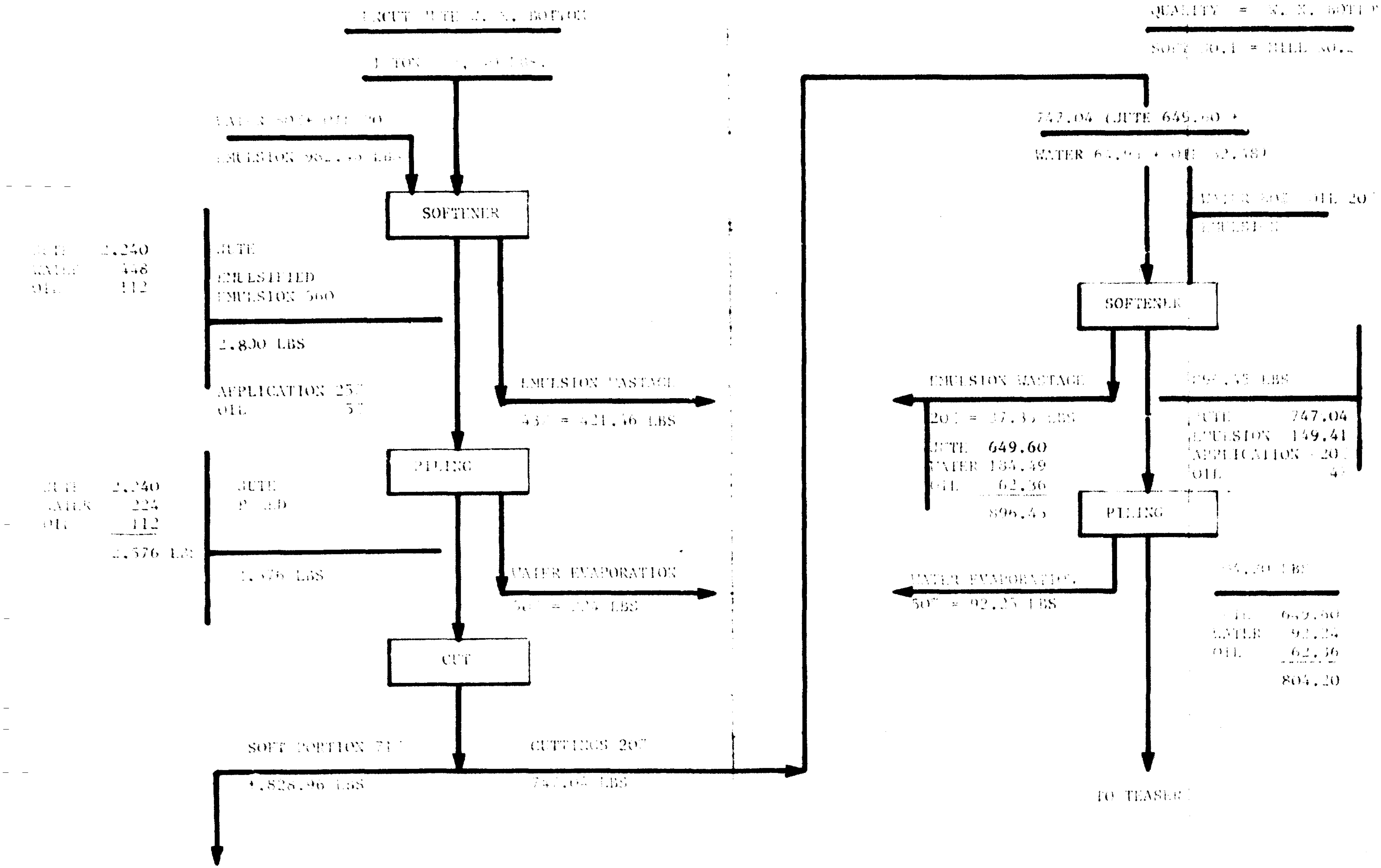
ANNEX 26/A



CHITTAGONG ACTUAL PROCESSING

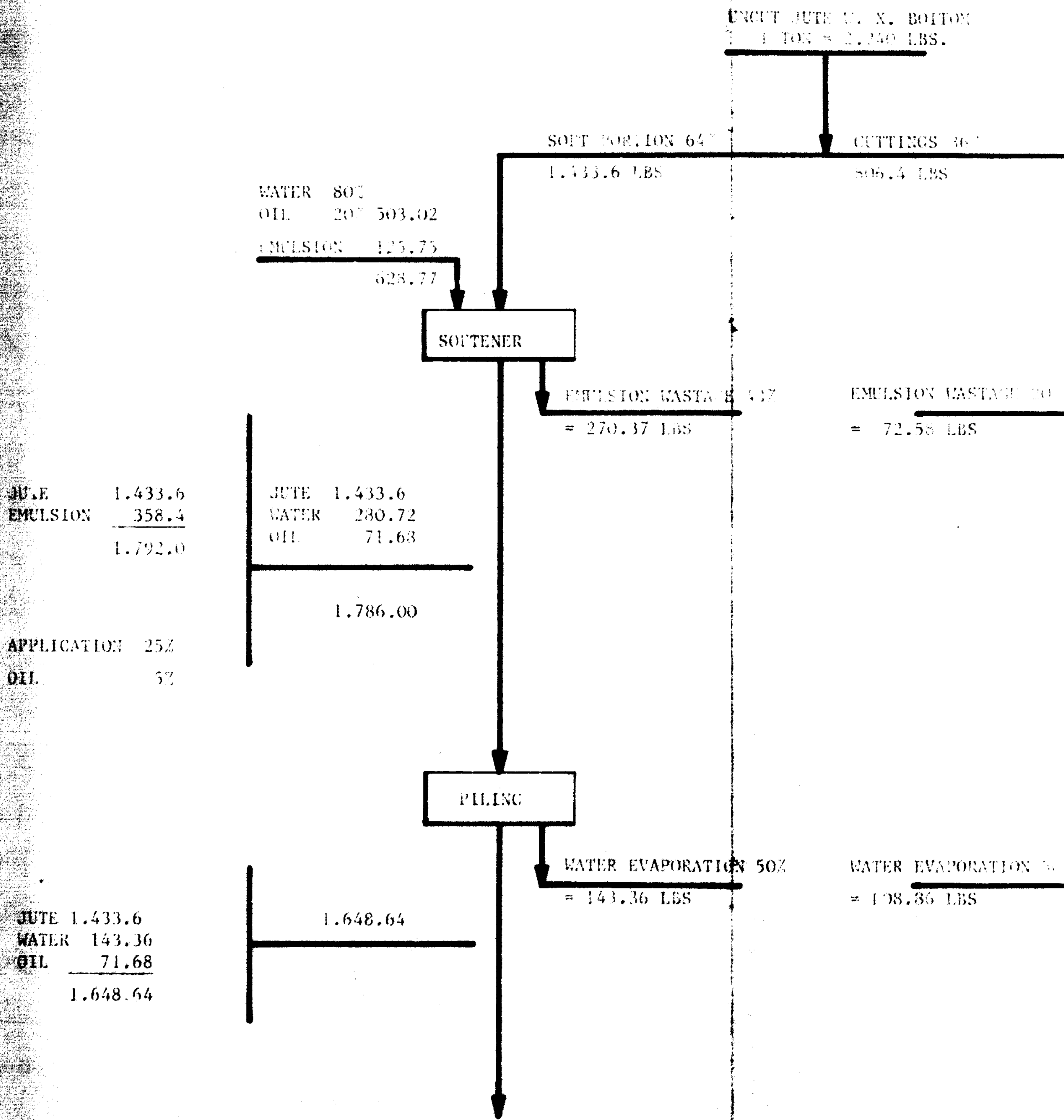
DATA FROM TEST CARRIED OUT ON 28.10.79

ANNEX 26/A



CHITTAGONG - PROPOSED PROCESSING

DATA FROM TESTS CARRIED OUT ON 28.10.79

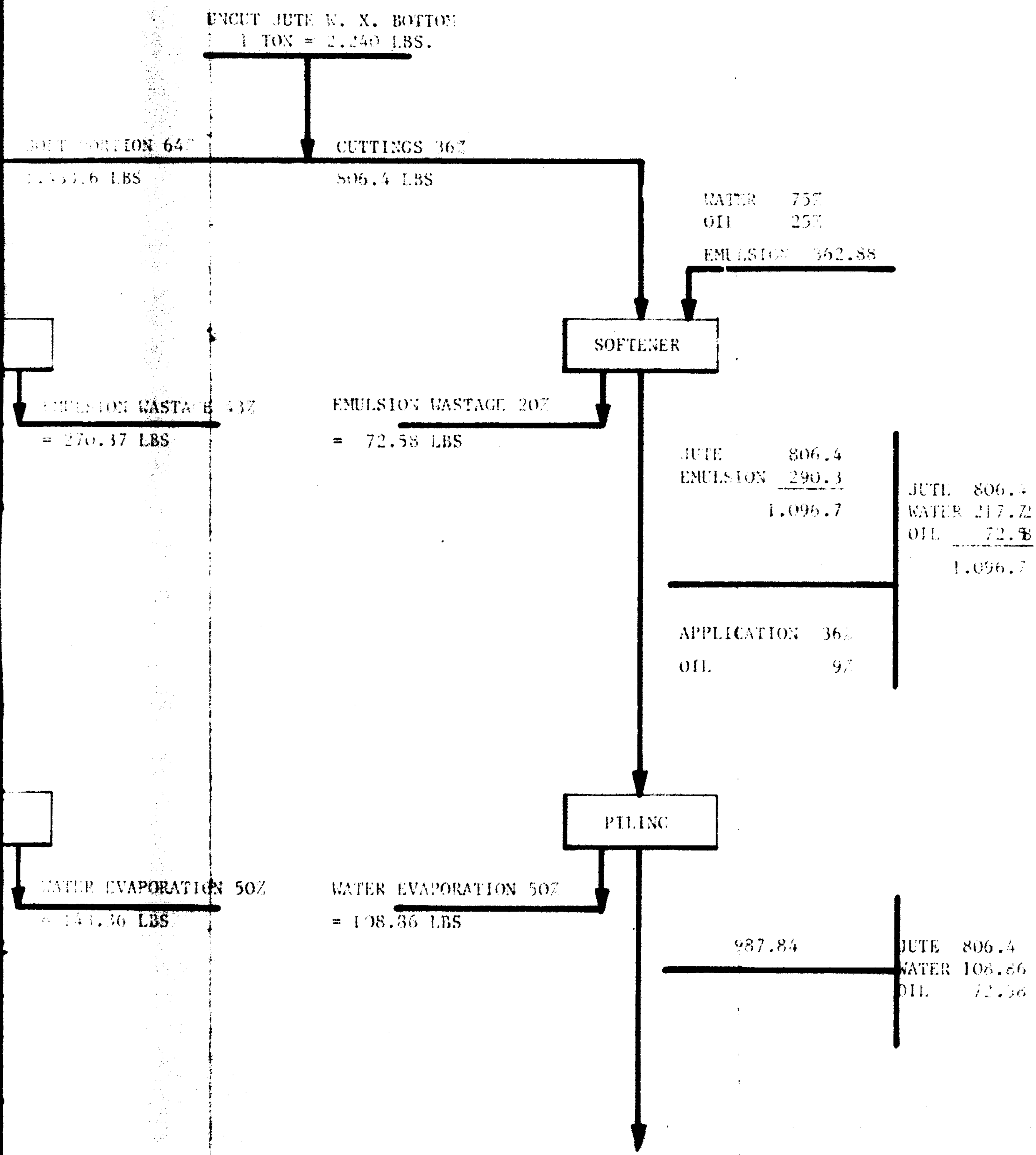


SECTION 1

...NG - PROPOSED PROCESSING

...ESTS CARRIED OUT ON 28.10.79

ANNEX 26/B



SECTION 2

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ANNEX 26/C

CHITTAGONG JUTE MFG.COMPANY LTD.

CONFRONTATION

Items	Actual	Proposed	Difference	% Risp.Act.
1) QUANTITY TAKEN OUT				
SOFT PORTION	1828.96	1648.64	-180.32	-09.86%
CUTTINGS	804.20	987.84	+183.64	+22.84%
TOTAL	2633.16	2636.48	+ 3.32	+ 0.125%
2) WORK LOAD				
OF THE SOFTENER	2240	1433.6	-747.04	
	747.04	806.4	- 25.01%	
	2987.04	2240.0		
3) EMULSION COMPOSITION	982.46	628.77	-177.57	
	186.76	362.88	- 15.19%	
	1169.22lbs	991.65lbs		
4) EMULSION WASTAGE	422.46	270.37	-116.86	
	37.35	72.58	- 25.4%	
	459.81	342.95		
5) $\frac{\text{WASTAGE}}{\text{CONSUMPTION}} \times 100$	$\frac{459.81}{1169.22} \times 100$	$\frac{342.95}{991.65} \times 100$	- 4.73	
	= 39.32%	= 34.58%	- 12.05%	
6) QUANTITY UNDER PILING	2800	1792	-807.75	
	896.45	1096.70	- 21.85%	
	3696.45	2888.70		
7) QUANTITY x DAYS	2800 x 5 = 14000	1792 x 5 = 8960	- 3237.75	
	896.45x 9 = 8068.05	1096.7x9= 9870.3	- 14.67%	
	22068.05	18,830.30		

ANNEX VI

BANGLADESH JUTE MILLS LTD:GHORASAL,DACCA:

PRESENT MECHANICAL CONDITION OF MACHINERIES TEASER CARD

	1	2	3	4	5
Cy der Roller	Not bad	Not bad	Not bad	Not bad	Not bad
Ro r for Worker Stripper	-do-	-do-	-do-	-do-	-do-
Dr ng Roller	Not bad	Not bad	Not bad	Not bad	Not bad
Fr ing Roller	-do-	-do-	-do-	-do-	-do-
Fr Delivery Roller	Not bad	Not bad	Worn out 1/32	Worn out 1/32	Worn out 1/3
Gaug ng for Rollers (C inder to Worker Stripper)	Proper	Proper	Proper	Proper	Proper
Lu icating	Improper	Improper	Improper	Improper	Improper
Br ht Roller Cloth	Torn out	Torn out	Torn out	Torn out	Torn out
St es for Cylinder Pin					
Dr t Ratio	13.28	13.28	13.28	13.28	13.28

J. K. BHOJAL
COUNTER PART
UNDP

MIRZA ANWAR ALI
MECHANICAL ENGINEER
BANGLADESH JUTE MILLS LTD.

S. FAZAL HOSSAIN
PRODUCTION MANAGER
BANGLADESH JUTE MILLS LTD.

ANNEX VI

ANNEX VII

borghi e baldo ingg.
s.p.a.

THE DACCA JUTE MILLS LTD.,
HASNABAD:DACCA.

TEASER CARD MACHINERIES OVER ALL CONDITION.
MILL NO.1.

Machines Serial No.	1	2	3	4	Remarks.
FEEDING CYLINDER	Quite good good	Quite good good	Quite good good	good good	
ROLLER & ARBOR CONDITION ROLLER SETTING & GUAGING	Arber worn out 5% Correct	Normal Correct	Normal Correct	Arber worn out Correct	
STAVES POSITION PIN CONDITION	good 6% broken & blunt	good 4% broken & blunt	good 3% broken & blunt	good 5% broken & blunt	
DRIVING CONDITION GEAR CONDITION	good 10% worn out	good 6% worn out	good 5% worn out	good 3% worn out	
GEAR ALIGNMENT STAVING CYCLE	Normal Routine way	Not upto the mark Routine way	Normal Routine way	not good Routine way	
RE-PINNING ON (CYLINDER) WORKER & STRIPER ON on	23.8.79 8.10.79 26.1.79	23.8.79 9.10.79 23.8.79	26.8.79 15.10.79 26.8.79	15.7.79 16.10.79 15.7.79	
LUBRICATING NIPPLES LUBRICATION GREASING	O.K. Normally Very rare	O.K. Normally good very rare	O.K. Normally good very rare	O.K. Normally good very rare	
DRAFT ~~Rate~~ pinion BRACKET, STUD & BUSHES	36T 4% worn out	36T 6% worn out	36T 3% worn out	36T 4% worn out	
CLEANING COVER CONDITION	Gear side clean not satisfactory good	Gear side clean not upto the mark good	Gear side clean not upto the mark good	Gear side clean not upto the mark good	

Manager Production 15/7   Mechanical Engineer   UNDP, Counterpart. 15/7/[illegible]

ANNEX VIII

Dr. R. Mazzali
Team Leader,
UNDP/UNIDO
Bangladesh Jute Mills Corp.

2nd May 1979

Subject : Re-pinning system of PJJM.

Dear Sirs,

The undersigned personally went to pinning Section of PJJM, Mills to see the method of re-pinning system of this Mill. The Mills is heavily loaded with staves of various cards awaiting for re-pinning. We saw some of the pins which are small in dia. and length mixed up with longer and bigger dia. pins.

The pins are fixed on the staves at a certain angle. The angles should be maintained during the operation of re-pinning cycle. Again the pin point bar (Pin banna) which is required for removing the pins should be smaller in diam. than the staves of damaged pin so that hole of the pins of staves does not affect or enlarge during removing of pins.

For re-pinning of cylinder staves, they are changing all the pins and full set. But in the case of stripper, worker and feed roller etc., they are sometimes changing only the damaged and blunt pins which will ultimately make trouble during gauging and setting of the rollers.

The undersigned asked the reason for above partial change, the Pin Boys informed that it was done for economical and time saving purpose. However, at present they are trying to change all the pins as it should be.

The Pin Boys also complained that the quality of pins is not good as it was before, for which frequency of re-pinning cycle of staves has been increased a lot, for which a good number of staves and failer bars are awaiting for re-pinning in Pin section.

At present, this Mill is equipped with following carding and preparing machines.

1.	Breaker Card	- 21 Nos.
2.	Finisher Card	- 31 "
3.	J1 Cards	- 2 "
4.	Teaser Cards	- 6 "
5.	Hard waste teaser	- 1 "
6.	1st Drawing m/c	- 24 "
7.	2nd Drawing m/c	- 25 "
8.	3rd Drawing m/c	- 27 "

The general condition of machineries is not so sound due to constant use and age. At present total strength of Pin Boys of this Mills is 25 (including one Head Pin Boy). We will request PJJM Management to make an enquiry about the total strength of Pin Boys of other similar Mills having same strength of machines to establish the efficiency and working capabilities of Pin Boys of this Mills.

We also observed that pin removing machine could not be possible to use on wooden staves, but metallic faced staves are good to use in re-pinning machines.

Thanking you,

Yours faithfully,

S.H. Mallik
DY. CHIEF ENGINEER (MECH.)
UNDP/UNIDO. Counterpart
KHULNA

ANNEX IX

FRA...R CHITTAGONG JUTE MANUFACTURING COMPANY LTD., P.O. MOHARA, KALURGHAT, CHITTAGONG Total N°. of M/cs =7

General condition of softener M/c in Mill N°.1

Sl.	Particulars	M/c. N°s. 1	2	3	4	5	6	7	Remarks
1	Condition of Bevel Gear (N°.teeth approx.worn out)	L.H.=24 R.H.=22	L.H.=20 R.H.=22	L.H.=40 R.H.=40	L.H.=25 R.H.=25	L.H.=24 R.H.=30	L.H.=4 R.H.=4	L.H.=6 R.H.=12	Left & Right side gear worn out
2	Condition of bushes (N°. approx worn out)	L.H.=20 R.H.=25	L.H.=24 R.H.=22	L.H.=40 R.H.=40	L.H.=36 R.H.=36	L.H.=20 R.H.=24	L.H.=4 R.H.=4	L.H.=10 R.H.=10	Top and bottom bushes worn out left and right side
3	Condition of Brize(plate) (N°. approx. worn out)	15	10	25	10	12	Normal	5	
4	Condition of Spring	Tension bad	Tension bad	Tension bad	N°. 3 short	Normal	Tension bad	Tension bad	
5	Condition of driving chain/belt	good	Normal	good	Normal	Normal	Normal	Normal	
6	Cleaning	improper	improper	improper	improper	improper	improper	improper	
7	Lubrication	O.K.	"	"	"	"	"	"	
8	Pairs of rollers	64	64	64	64	64	40	64	
9	Condition of rollers (approx.fluted portion worn out)	25%	25%	30%	25%	25%	Normal	10%	
10	Rollers arbor condition upper and lower out of 128 pieces	16%	30%	40%	20%	24%	25%	22%	

MANAGER PRODUCTION UNDP COUNTERPART MECHANICAL ENGINEER

ANNEXE IX

ANNEX X

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s.p.a.

JUTE AND JUTE MORRAH

by Mr. Kamal Uddin Ahmed

INTRODUCTION

In India jute had been used many years but the fibre was not known in Europe until the Eighteen Century.
In the year 1796 small quantities of jute were brought to England by East India Company. They spun by hand and used as twine.
In 1823 a Bale or two of jute was bought by a Dundee merchant but the spinners were not impressed till 1832. In 1832 a spinner succeeded in making an acceptable yarn. And after that the use of jute fibre became famous.
Nowaday, jute is mainly used in many purposes like Hessian Cloth, Carpet Backing, Container (bags), Wall Covers, Curtain, Fire resistant Cloth, Insulator, etc.

WHAT IS JUTE?

Jute is a stem bast and hard fibre. Its nature is cellulosic as Jute fibers are obtained from natural sources.

CULTIVATION

Jute is cultivated in West Bengal and East Bengal. The people of East Bengal and also the West Bengal say that the jute is golden fibre.
It is called the golden fibre as it earns maximum foreign exchanges for their country from other countries by selling jute.

Jute is a rainy season crop. Damp heat is the most favourable for its growth. Excessive rain, saturating the soil with moisture, delays both sowing of seed and the after treatments. Occasional showers of rain are very beneficial for the growth of the plants.

The temperature on the tracks where jute is grown hardly exceeds during the growing season 100°F. Humidity varies from 65% to 91%.

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s.p.a.

Seeds are sown in the month of March and the harvesting is done generally in the last week of July or in the month of August. During this period which lies in between the seed sowing and harvesting, other functions are being done by the cultivators. Inese are after treatments cutting, etc. But it is to be noted that before sowing the seeds the soil is to be prepared for sowing. After the harvesting of the crop steeping or retting then washing and drying are very important functions to obtain proper fibers. All these are done on experience.

a) Jute Stem: (see X/10)

The general structure of the jute stem shows in cross section concentrically arranged phloem pyramids on the woody core. A number of fibres are attached forming a fibre bundle which is surrounded by soft tissue.

The number of fibre layers diminishes from the bottom to the top as the stem tapers upwards, and near the appex there may be only one layer. Near the lower part of the stem the mesh of fibre is long and wide, and gradually decreases towards the tip, where the meshwork is not visible. Similarly the fibres on the outer part of the stem have a longer and wider mesh than towards the interior. The fibres obtained from the bottom, and outer part of the stem will therefore be coarser textured. This is exemplified in root cuttings, and where alternate drying and flooding has occurred so the extent of the root part is influenced. Certain varieties produce more roots than others.

b) Structure of Jute Fibre

The individual jute fibre being made up of a large number of cells or ultimate fibres cemented together by amosphous (uncrystallized) substances. These ultimate fibres are again made up of fibrils, which fibrils are once composed of bundles of molecular chains held together closely and known as miscelles.

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b) (cont.d)

Jute is a compound fibre as the bundle branch and reunite from higher to lower levels in the stem producing a mesh-work. The mesh-work is produced by compound bundles, which can easily be seen in the root end.

Through microscope it is seen that approximately 30 wedges in x-section, 15 layers of bundles in each wedge, with a large number in the inner layers than in the outer layers. Each bundle in the wedge contains some 10 to 20 single fibres, bundle diam. 0.05 mm or 0.002 inch. The ultimate fibres are thicker in the middle than at the end of the widest parts being approximately 1/1000 inch and at the end 1/1250 inch. With length varying from 1/10 in. to 1/7 in.

c) Identification of jute fibre

i) Burning test:a flame was neared to the end of a single fibre -it burned fast - little odour.

ii) If jute fibre is treated with Acetone for 10-15 minutes, the jute fibre is insoluble.

iii) If it is boiled with 5% solution of NaOH - fibres will be weakened but not dissolved.

iv) When treated with a mixture of Ferric Chloride and Potassium Ferricyanide solution · Fibres become Prussian blue.

v) When treated with iodine and H_2SO_4 - Fibres turn yellow.

iv) Treated with 1% Phloroghicin in 2% Hydrochloride A: it turned red.

iiv) Longitudinal and X-section views of jute fibre by microscope as follows:

(See X/11.)

CONSTITUENT OF JUTE FIBRE

The following constituents are available in jute fibre:

- Cellulose 65.2%
- Hemi cellulose 21.8%
- Lignin 11.0%
- Fat and Wax 0 8%
- Ash 1.[illegible]%

MARKETING

Raw jute which is un-sorted, is brought into the local village huts or Bazars where the Baparies and Farias purchase jute from the cultivators. This is primary marketing.

The Baparise and Farias bring raw jute which may be assorted or unassorted and in Kutcha Bale form to sell to the shippers, merchant or pucca balers. Sometimes pucca bales also may be made into the secondary market.

Terminal market where pucca bales are made with assorted jute. Shippers, balers, and merchants sell or to buy jute in pucca bale forms. In pucca bale jute must be without root parts (cutting) and combed (hackled). Shippers sell pucca bales to the foreign countries and shipment is done from the terminal market area ports e.g. Chalna and Chittagong in Bangladesh.

Properties to ascertain the Quality of Jute

The characters usually regarded as constituting jute quality are:

I Colour
II Lustre
III Strength & Durability
IV Cleanliness
V Fineness
VI Length
VII Proportion of roots
VIII Moisture Content.

A good quality fibre should have good colour, lustre, fineness, length and strength and also the above properties.
No knots, specks or sticks should be present in the quality jute.
Percentage of cuttings should be as low as possible.
Capable of spinning into fine yarn with a standard moisture content.

Defects in Jute

(i) Rooty, (ii) Runners, (iii) Hunka, (iv) Mossy, (v) Croppy, (vi) Specky, (vii) Sticky, (viii) Knotty, (ix) Dazed, (x) Dirty.

Some Definitions

Hunka : This is due to defective retting, dark strips of periderm and dried up gum adhere to almost the entire length of the fibre.

Mossy : Large numbers of adventitious roots are developed at the bottom of plants, growing in swamps.

Croppy : This is due to improperimmersion during steeping. The top ends are comparatively hard and rough and sometimes with bark.

Dazed : This is due to over retting or storing jute in moist conditions. The fibre becomes dull, lifeless and of inferior strength and spinning quality.

Knotty : This is mainly due to insect injuries especially by Apion Corchoric.

CLASSIFICATION OF JUTE

Commercially jute fibre is divided in the following way (Bangladesh)

Corchorous Capsularies (White Jute)	Corchorous Olitorius (Tossa Jute)
i) Jat	i) Jat
ii) District	ii) District
iii) Northern	iii) Northern

i) Jat Jute

This is the best class of jute with best colour, lustre and good in strong, sound, long, hard, clean and fine.
The colour is from white to cream and the lustre is silk like.
Tossa jat jute is brownish, soft handling and lustre is silk like.
In Dacca, Mymensingh, Tangail and Comilla, Jat jute is cultivated.

ii) District

District jute is inferior to jat quality hence the colour and lustre of Distric jute are inferior to that of Jat jute.
District is strong, long and sound. The fibre may be hard as well as soft. This is coarser than Jat jute and not so clean.

District jute growing areas are: Pabna, Syleht, Chittagong.
Hard District jute area: Faridpur
Soft District jute area: Kushtia, Khulna, Jessore.

iii) Norther Jute

Northern jute is inferior to District. Northern Jute is soft and long, but the fibre is not so strong, fine, clean and glossy as District.

Northern Jute growing areas are: Dinajpur, Rangpur, Rajshahi and Bogra.

GRADES OF KUTCHA WHITE JUTE

1) White Top: very strong fibre. Fairly good length. White/Creamy White/ Bright light golden colour. Excellent lustre. Free from any defect. Maximum proportion of cutting by weight 20%. Would correspond to BANGLA WHITE SPECIAL when converted to pucca.

2) White Middle: strong to sound fibre. Fair length. White/Light cream/ reddish colour. Good lustre. Free from specks, runners and harsh crop ends. Maximum proportion of cuttings by weight, 20%. Would correspond to BANGLA WHITE A when converted to pucca.

3) White B. Bottom: sound fibre, fair length. Silver White/Light cream to straw colour. Good lustre. Free from dark grey and weak fibre. Free from specks and runners. Maximum proportion of cuttings by weight 25%. Would correspond to BANGLA WHITE B. when converted to pucca.

4) White C. Bottom : average strength. Any colour. Average lustre. Free from hard centred juteand runners and hard gummy tops. Maximum proportion of cuttings by weight 33%. Would corrspond to BANGLA WHITE C. when converted to pucca.

5) White X. Bottom: any strength. Any colour. Occasional croppy and gummy tops with barks and specks and hard centred jute. Maximum proportion of cuttings by weight 40%. Would correspond mostly to BANGLA WHITE D when converted to pucca.

GRADES OF KUTCHA TOSSA JUTE

1) Tossa Top: very strong fibre. Good length. Golden/red/creamy white colour. Excellent lustre. Free from any defect. Maximum proportion of cuttings by weight 15%. Would correspond to TOSSA SPECIAL when converted to pucca.

2) Tossa Middle: strong to sound fibre. Fair length. Cood lustre. Silver grey to golden colour in case of jat, and light golden to reddish colour in other cases. Free from specks, runners and hard croppy ends. Maximum proportion of cuttings by weight 15%. Would correspond to BANGLA TOSSA when converted to pucca.

3) <u>Tossa B. Bottom</u>: sound fibre. Fair length. Good lustre. Medium grey/ copperish grey in case of jat and light grey/reddish in other cases. Free from specks and runners. Maximum proportion of cuttings by weight 20%. Would correspond to BANGLA TOSSA E when converted to pucca.

4) <u>Tossa C. Bottom</u>: average strength. Any colour. Free from hard centred jute and runners and free from black wiry tops. Slightly gummy and croppy tops permissible. Maximum proportion of cuttings by weight 20%. Would correspond to BANGLA TOSSA C. when converted to pucca.

5) <u>Tossa X. Bottom</u>: any strength. Any colour. Occasional croppy and gummy tops, with barks and specks and hard centred jute. Maximum proportion of cuttings by weight 25%. Would mostly correspond to BANGLA TOSSA D when converted to pucca.

<u>GRADES OF PUCCA WHITE JUTE</u>

1) <u>Bangla White Special</u>: White/Creamy White. Jute of the finest texture, Very strong and very good lustre. Completely free from any defect. Clean cut and well hackled and entirely free from red ends.

2) <u>Bangla White A.</u>: White to light cream. Jute of fine texture, strong and very good lustre. Completely free from any blemish. Clean cut, well hackled and entirely free from ends.

3) <u>Bangla White B</u>: Light cream to straw colour, jute of good texture, strong and good lustre, free from blemish. Clean cut and well hackled, red ends excluded.

4) <u>Bangla White C</u>: Light Grey/light reddish to straw colour. Clean jute of sound strength and average lustre. Free from hard specks and croppy or hard gummy tops. Well cut, well hackled, free from black roots, red soft and permissible.

5) <u>Bangla White D</u>: Any colour. Average strength, occasional bark and specks permissible. Slightly croppy and gummy tops permissible. Well cut on the hard hackled. Red ends permissible.

6) Bangla White E: Any colour. Any strength but free from perished fibre. Free from any unretted jute and stick but bark and hard centre permissible. Rough cut on the hard and hackled.

GRADES OF PUCCA TOSSA JUTE

1) Bangla Tossa Special : Uniform colour, golden/red. Tossa of finest texture, very strong and very good lustre. Completely free from any defect. Clean cut and well hackled.

2) Bangla Tossa - A :

   a) Uniform colour, silver grey to golden. Tossa of fine texture, strong and good lustre. Completely free from any blemish. Clean cut and well hackled.

   b) Uniform colour, light golden to reddish. Tossa of fine texture, strong and good lustre. Completely free from any blemish. Clean cut and well hackled.

3) Bangla Tossa - B:

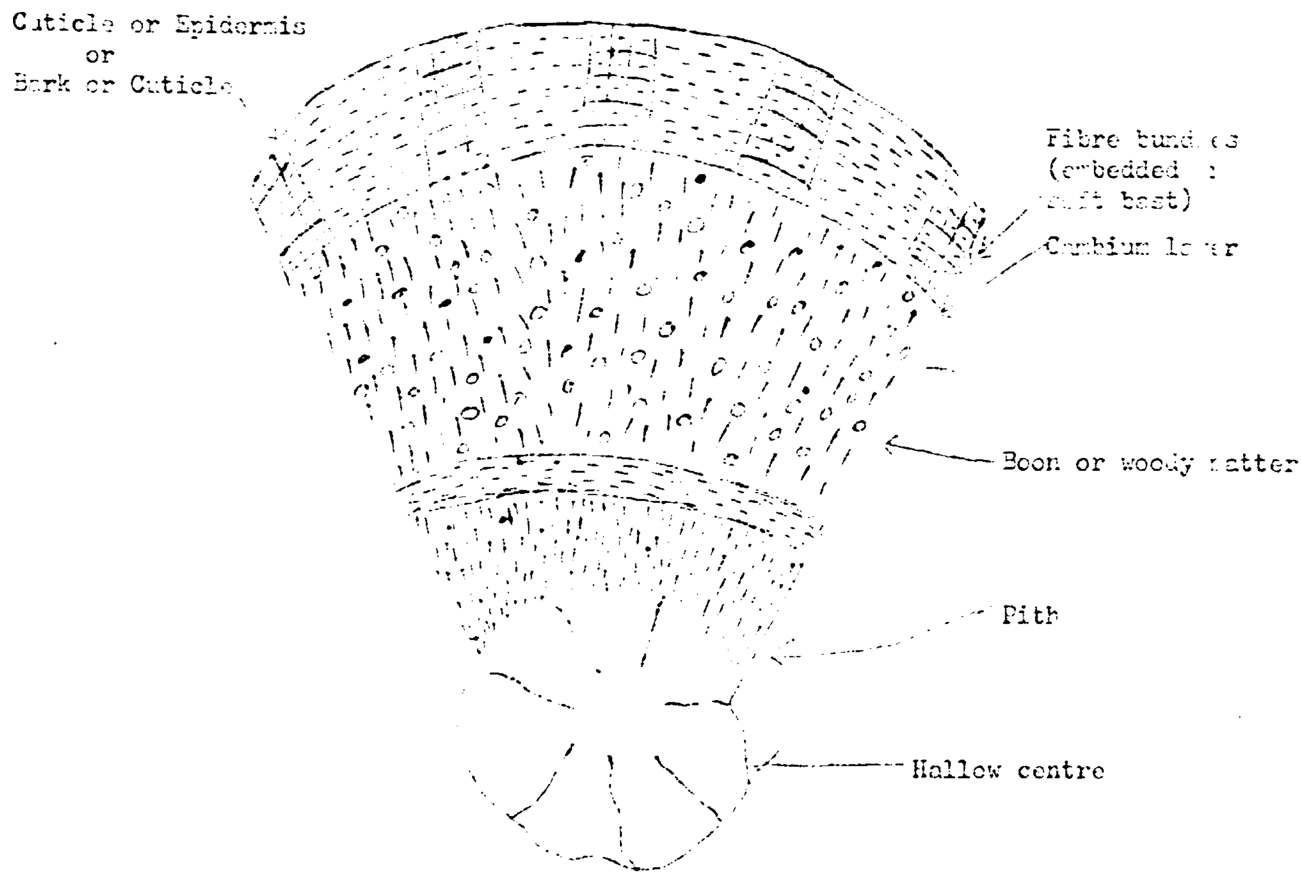
   a) Light to medium grey/copperish grey. Clean sound fibre of good texture and good average lustre. Free from blemish. Clean cut. Well hackled.

   b) Light grey/reddish excluding dark grey. Clean sound fibre of good texture and of good average lustre. Free from blemish. Clean cut and well hackled.

4) Bangla Tossa - C : Mixed colour. Average strength, occasional bark and soft speck, but free from runners. Slightly croppy and gummy tops permissible. Free from black wiry tops. Well cut and hackled and free from black root ends.

5) Bangla Tossa - D: Mixed colour. Average strength, occasional bark and speck but free from runners. Croppy and gummy tops permissible. Rough cut and hackled, but free from black root ends.

6) Bangla Tossa - E:Any colour. Any strength but free from perished fibres. Free from unretted jute and stick but bark and hard centre permissible. Rough out and hackled.



<u>Cross Section of Jute Stem</u>

borghi e baldo ingg.
s. p. a.

PHYSICAL PROPERTIES OF JUTE

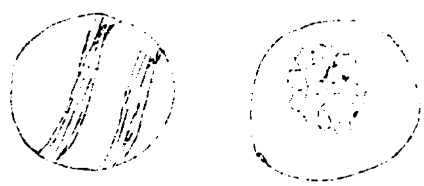
The main physical properties of jute can be summarised as :

Ultimates

Length = 2.5 mm
Diameter = .018 mm - .025 mm (i.e. 18-25µ)

Single Fibre

Length = 0.508 - 76 cm
Tex = 1.9 - 2.2
Tenacity = 40 - 70 g tex
Extension at break = 21 - 2%
Moisture regain at 65% Relative humidity & 70°F
Absorption = 12.5%
Desorption = 14.6%
Specific Gravity = 1.48 to 1.51.



Longitudinal & x - Section views of a jute fibre.

MORRAH WEIGHTS

By K.U.Ahmed
of Productivity Team

It is well known that the first working steps have an enormous impact in the jute processing; because every fault made in the initial phase is reflected in the efficiency of the spinning department, with no chance to be cancelled during the different stages of working process.

For this reason, our productivity team bothered to control the different working stages, on the 4 Pilot Mills, in a very accurate way.

The initial situation we found is stated on the First Column of Figures, which gives you the Morrah Weights inside the standard lines, the light ones and the heavy ones.

From this initial data, we point out to your attention the following considerations:

a) The importance of a correct standard weight is connected to a regular feeding of the softeners and of the hand feeding of Breaker Cards, where the making of a regular dollop is based on regularity of morrahs which are the components of the same.

b) Different standards of weight are assumed in some mills in spite of BJMC circulars on this particular matter.

c) The control on regularity of morrahs weights looks very different from one Mill to another: in some mills this control, even though done in a random way, shows a certain validity in its results, in others it was neither in use nor taken in high consideration.

d) Supposing the control showed that most of the Morrahs are out of standard lines, there was no practical action by the supervisors to try to eliminate this processing fault.

e) On this subject, talking about a hand-made operation, training of workers is of a fundamental importance.

For a complete training cycle of workers on Morrahs department, we found the following difficulties:

1) In the mills which have all the workers of the above mentioned department on their regular paying lists, there is always the problem of absenteeism, which implies the presence at work of a percentage of up to 25-30% of unskilled people as replacers.

2) In other mills, we found in this department a very high percentage of subcontract workers, with less possibility of control on their work.

3) In all the mills there is general shortage of supervision in the department, either for lack of staff or else for impossibility of replacement of supervisors when absent. On this point, we think that first training should be done just to the Sardars and Supervisors.

Our Productivity Team, for your information, has carried out in all the 4 Pilot Mills a training course at workers level: the results are shown on the second column of figures. This training course had only a demonstrative purpose, to show to the people involved in the operation how to detect eventual faults and what to do about same. It was organized on a three-level basis: gathering of tests-analysis and evaluation of the same - consequent corrections.

Solving the problems implies a long, patient and daily work, which should be carried out by the single mills. Training and control of the results should be a part of mill organization, according to the main line of checking the trend of single workers and taking the relative steps. Obviously the easiest result will be obtained from workers which are showing an univocal tendency on work (it means to work all on light or heavy side): in their cases, correction will be relatively easy, training will concentrate on increasing or reducing their hand-weight,

in order to concentrate their morrahs to standard lines.
More difficult and long will be the training for those workers working on both sides of standard lines, i.e. on heavy and light weights.
We point out to your attention and to the attention of your supervisors that in some cases that would be a mark of lacking of bent on this particular kind of work.

After the demonstrative training stage of our programme work, our Team was no more able to pause on this particular problem, but collected after a certain period of time new tests which show, as you can see on the third column of figures, quite a percentage of morrahs still out of range, with only slight improvement.

PRODUCTIVITY TEAM PROPOSAL

1) Due to concrete impossibility of a general daily control on all the workers involved, we suggest a random daily checking.
The workers who undergo the daily checking should be trained by the Department Supervisors, using the same method employed by our Team. Consequently there should be a daily rotation of the workers subject to control, so that in a certain time unit all the workers involved will be undergoing the training stage.

2) This control system should be assumed as normal routine in every Mill organization.

3) When the departments situation will show a certain regular trend it is up to the mill production Officers to take in right consideration the problem of the ratio between the morrahs weight and the Moisture regain of raw jute.

4) Consequently to point 2, in every morrahs preparing department there should be at least two scales.

5) We also recommend a unitary wages policy, so that all the workers of the department involved, regardless of mills and zone, will earn the same pay: this to avoid problems similar to those which arose in Platinum Jute Mill.

Standard Weight = 32 - 48 ozs.

CHITTAGONG JUTE MILL

BEFORE TRAINING				AFTER TRAINING				PRESENT POSITION				REMARKS
No. Tests	Light	Standard	Heavy	No. Tests	Light	Standard	Heavy	No. Tests	Light	Standard	Heavy	
750	127	494	129	750	8	724	18	750	10	727	13	
		66%				97%				97%		

Sl. No	Name of Workers	BEFORE TRAINING				
		Light	Std.	Heavy	Total Test	Lig
1	Jauban Ali	4	17	4	25	
2	Abdur Rashid	4	18	3	25	
3	Sirajul Islam	3	19	3	25	
4	B.M. Talukder	5	18	2	25	1
5	Mafizur Rahman(a)	2	19	4	25	1
6	Mafizur Rahman(b)	6	14	5	25	1
7	Abdul Jabbar	3	16	6	25	
8	Ali Karim	1	20	4	25	
9	Chanu Mia	3	18	4	25	
10	Fazal Haque	6	15	4	25	
11	Fazal Islam	6	16	3	25	
12	Mojibul Haque	7	13	5	25	
13	Mohd. Hossain	2	18	5	25	
14	Aminul Haque	3	16	6	25	1
15	Abu Syem	7	17	1	25	
16	Samir Talukder	4	16	5	25	
17	Abu Taher	5	14	6	25	
18	Arun Ch.Biswas	8	13	4	25	1
19	Nitai Talukder	8	13	4	25	1
20	A. Malek	5	16	4	25	
21	Siddique Ahmed	4	17	4	25	
22	Abdur Razzak	5	16	4	25	
23	Lal Miah	2	18	5	25	
24	Nazir Ahmed	5	15	5	25	
25	Zafar Ahmed		20	5	25	
26	Obaidul Haque	3	18	4	25	
27	Samu Miah	3	18	4	25	1
28	Sultan Ahmed	6	18	1	25	
29	Nawab Ali	2	16	7	25	1
30	A. Taher	5	12	8	25	
	GRAND TOTAL	127	494	129	750	8

Standard Weight of Morrah 32 - 38 ozs.

	AFTER TRAINING			PRESENT POSITION				REMARKS
t	Std.	Heavy	Total Test	Light	Std.	Heavy	Total Test.	
	25		25	1	24		25	
	25		25	1	24		25	
	25		25		25		25	
	24		25		23	2	25	
	24		25		24	1	25	
	24		25		25		25	
	24	1	25		24	1	25	
	25		25		25		25	
	25		25		25		25	
	25		25	1	22	2	25	
	23	2	25		25		25	
	23	2	25		24	1	25	
	24	1	25	1	23	1	25	
	24		25		24	1	25	
	22	3	25		25		25	
	24	1	25	1	22	2	25	
	24	1	25		25		25	
	23	1	25	1	24		25	
	24		25	2	21	2	25	
	24	1	25	1	24		25	
	23	2	25		25		25	
	24	1	25		25		25	
	25		25		25		25	
	25		25		25		25	
	25		25	1	24		25	
	24	1	25		25		25	
	24		25		25		25	
	24	1	25		25		25	
	24		25		25		25	
	25		25		25		25	
	724	18	750	10	727	13	750	

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REPORT ON EMULSION

By

Productivity Team

GENERAL NOTES

- It is known that the first phase of jute processing consists in batching jute with an EMULSION, made by water oil and emulsifier, in order to facilitate the fermentation of jute in the subsequent phase of maturing (PILING), and consequently to make it more treatable for the carding and spinning process.

- The efficiency of the whole process depends mostly on an exact application of correct EMULSION at its initial phase.

  To obtain a good maturing of jute, it is necessary that oil permeate the entire fibre uniformly and deeply. For this reason, oil is not used in its natural state but it is emulsified. Through emulsion oil loses its viscosity and drops, becoming more small and light, can be uniformly distributed and can better penetrate the entire fibre.

- EMULSION, in other words, is like a vehicle for transportation and uniform distribution of oil on the fibres.

- It is obvious that more the composition of emulsion is stable (i.e. more its three elements : oil-water and emulsifier are rightly mixed), better it absolves its function. If the three above mentioned elements tend to decompose, then the emulsion is not rightly made.

- The emulsifying agent (Emulsifier) is added to the mixture just in order to get the right emulsion from water and oil.

- The Emulsion should remain stable for at least 24 hours, from the moment of its composition: it means that at least for 24 hours it must keep a uniform colour and do not show any sign of decomposition. The colour should be milky-white and uniform. The easiest and normal way of testing the stability of emulsion consists in observing the colour of emulsion in a glass test-tube. Any variation of colour denotes an initial stage of decomposition of emulsion into its parts.

- The initial stage of breaking of the emulsion is seen when at the bottom of the test-tube appears the first layer of water: at the final stage of decomposition only, we have the floating of oil on surface of emulsion. This is a very important point which should be kept clearly in mind by control officers, because on this particular subject we heard the most different and wrong opinions at different levels of mill management and staff.
- The time limit of 24 hours during which the emulsion should remain stable is due to the fact that jute, during the maturing phase, undergoes a fermentation process with emission of heat, due to the increase of temperature: this increase of temperature is more relevant after the first 24 hours of the total time of maturing; which varies from 4/5 to 8 days according to the quality of fibre.
- If emulsion is not immediately used, it is possible to keep it in special tanks, but under the same conditions of temperature and mechanical stirring by an agitator.
- The temperature needed for a good emulsion composition can vary, depending on type of oil and emulsifier used: normally the temperature varies from 50°C to 60°C, but on particular emulsifier (see Nonidet P.40) it should not rise to more than 40°C.
- Oil, water and emulsifier should have definite physio-chemical characteristics which can be found in the specific literature. We will only state some general points on the three different elements.
- OIL generally utilized for the emulsion is a mineral oil, which should have the same general requirements of a good lubrificant oil, with particular care for density, viscosity, acidity, volatility and point of inflammability. Colour of a good mineral oil shows a straw-coloured

one, with very light smell. Point of inflammability should not be less than 160°C. Mineral acidity should be as low as possible, to avoid acid erosion on the fibre with consequent loss of strength on the same. Also volatility should not be too low, to avoid loss of oil during the process of heated emulsion.

- <u>WATER</u>: very important factors are its hardness and the contents of mineral salts: in particular, as too high hardness of water hinders the composition of a stable emulsion.

  Generally speaking, in modern processing, it is highly recommended to use condensed water, which normally is directly taken from dressing machines to the emulsion plants.

- <u>EMULSIFIER</u>: there are many good chemical emulsifiers on the market, but also for this element it is highly recommended to use well-known products, which should be supplied by the supplier Firm with all the instructions about composition, percentage of employ, advisable temperature of emulsion mixing, etc. It should be normal routine for Quality Control of each mill to do tests about any new product or supply of normal product, when the same is <u>entering</u> in the mill compound.

<u>REPORT ON GENERAL EMULSION PROBLEMS IN THE 4 PILOT MILLS WITH TEAM PROPOSALS.</u>

Some problems are general and univocal in all the 4 Pilot Mills concerned in our Programme, and we would like to point them out with the consequent proposals of our Team on each of them.

- <u>OIL</u>: On page X/26 are shown the most striking characteristics of Jute Batching Oil supplied to the different Mills, tests done on our behalf by the Jute Research Institute. We can notice certain regularity in density, but a striking difference in viscosity and pH on different supplies to two different mills in relation to the others.

Moreover, in all the four samples the colour of oil appears dark, with smell of Kerosene. This last factor is the first and most visible sign of a type of oil not suitable for a good jute processing, not only for the composition of a stable emulsion, but also for the effect on the products manufactured, specially on jute goods used as containers of food-stuff for export purposes.

We should like to point out on this point that last year, for a contract of food containing bags from Japan to the Chittagong Jute Mill, the buyer furnished to the mill as reference a sample of jute Batching Oil, which appeared light in colour and almost odourless; we collected a sample of Jute Batching Oil used by the same mill on the Japanese reference basis and the characteristics, tested by the Jute Research Institute, have given these results:

(The results will be handed over as soon as we receive the memo by the courtesy of Dr. M. Kabir of the Bangladesh Jute Research Institute.)

Our opinion is that it should be absolutely necessary to fix standard characteristics for the Jute Batching Oil supplied to all the BJMC mills, standard characteristics which should be worked out by a joint work between the Jute Research Institute and the Eastern Refinery Company, which is the only supplier in Bangladesh. After those standards will be fixed, it is up to BJMC to require from the Refinery Company a stable supply of Jute Batching Oil on those basis to all the Mills involved.

- WATER: On page X/27 are shown the different types of water employed for emulsion in the 4 Pilot Mills. On this point we like to recall what already said on "General Notes" on this Report, i.e. on the absolute necessity to use condensed water in order to get a correct emulsion.

- EMULSION: On page X/28 are shown all the different types of emulsifiers used in the different 4 Pilot Mills.

It is highly recommended to buy the chosen emulsifier directly from the main supplier, to avoid adulteration of the original product.
In the meantime another advice is to take tests before using new products, tests which, done with the percentage of employ and with the form advised by the supplier, could be easily carried out on behalf of all BJMC Mills in the Textile Institute of Dacca, where can be found a modern emulsion plant for jute suitable for complete batching tests. On this subject our strong Team advice is to abstain from changing emulsifier with too much ease, only on basis of cheap price: the decision should be made only on basis of technical results, better if those are supported by an economical saving.
As you can easily understand by the arguments in General Notes of this Report, the emulsion is one of the main factors of jute processing: a bad emulsion will result in a bad efficiency of your spinning department with a high rate of waste, elements which will weigh in a determinant manner on the economic costings of the Mills.

Another general important factor in the use of emulsifier is the percentage of employ: during our control in the 4 Pilot Mills we found a right percentage only for the new Rapisonic Plants, instead in all the old plants the percentage is considerably below the European level with results of an emulsion very instable and with high points of breakage. It should be kept in mind that increasing the percentage of emulsifier, the trend for a stable emulsion is also increasing, as you can easily see by the results which are showing up in the Annexes of next point referring to different tests made by our Team in the different Pilot Mills.

COMMENTS ON ANNEXES

(A) DACCA JUTE MILL : This mill has an ordinary emulsion Mackie emulsion plant. This mill is employing actually 0.125% of emulsifier Nonidet P.40, with result of a 56% of breaking of emulsion after 24 hours.

On X/29 it is shown that by increasing gradually the percentage of the same emulsifier to reasonable levels, the final percentage of breakage is decreasing accordingly with result of much better emulsion.

It has to be taken in consideration that in this mill we have 2 elements, of the three composing emulsion, in correct position = water (which is condensed) and emulsifier (which is an original, known type). For optimum result and according to the supplier's advice too, 1% of emulsifier should be used = nonetheless acceptable results are shown on X/29 , with lower percentages.

(B) BANGLADESH JUTE MILL: This mill has two emulsion plants: Rapisonic Plant and Conventional Old Plant.

On Rapisonic Plant, pages X/30 and X/30 A show that only by the change of emulsifier passing from a local one to an imported one) the percentage of decomposition after 24 hours dropped from 48 (see X/30) to 4.75 (see X/30 A). Still better results are showing up using condensed water (2.5%).

On conventional old plant, the mill has been using in the past either Hostapol supplied by local market or soft soap: Annex 4 shows that SAME results on decomposition percentage are obtained using a percentage of Hostapol 10 times lower as that of soft soap. Taking in consideration that market prices could be valued for Hostapol in Tk. 21 per Gl. and for soft soap is Tk. 215 per Gl. (i.e. soft soap price is 10 times cheaper as Hostapol) it results that, using local made soft soap, the mill cost will be the same obtaining also the same final conditions.

(C) CHITTAGONG JUTE MILL: This Mill has two emulsion plants - Rapisonic and conventional old plant.

On Rapisonic plant, with use of correct percentage of emulsifier for those plants (i.e. 0.5%), the results are the same, using different emulsifiers or local or bought on local market. (see X/31) - the percentage of decomposition after 24 hours rises to 24%.

On conventional old plant. the results are very poor due mainly to a structural defect in the plant itself: size of tanks is wrong, as are the number and the position of blades inside the the main tank. It appears clearly that in this Plant no increased percentage of emulsifier modifies the final decomposition percentage, which looks almost stable.

(D) PLATINUM JUTE MILL: This mill has a Rapisonic Plant for emulsion. It was clearly noted that, only by using condensed water instead of river water normally used and not diluting emulsifier before use, SAME results on final % decomposition are obtained decreasing the percentage of used emulsifier from 0.5% to 0.375%. (See X/32 for normal water utilization).

REPORT ON MECHANICAL CONDITIONS OF RAPISONIC PLANTS

A complete report is given elsewhere on the mechanical conditions of Rapisonic plants in the 3 Pilot Mills which are supplied with these Plants.

FINAL ADVICE

(1) Our first advice is to send an explicative circular to all the mills involved in the Project; Circular which will assert once and for all the stability concept and the manner to detect the same in simple and empirical way (see page 2 of General Notes).

(2) All new products employed should be previously tested on quality basis (see Page 4 of General Notes).

(3) The supply of Jute Batching Oil and emulsifiers should be made in a centralized way by BJMC, with a consequent reduction of costs, and time supply and more safety on the quality of product supplied.

(4) Standard characteristics of Jute Batching Oil for Bangladesh should be worked out (see Page 5 of the Report).

(5) General advice should be given to all the mills to use condensed water: mechanical officers in each mill are quite able to study, for each mill, the possibility to draw pipelines from dressing department to emulsion plants. Cost for this work appears trifling in ratio to results which can be achieved.

(6) Emulsifiers employed could be various, the important thing is they should be well known ones and original (i.e. imported ones or, if bought on local market, of good quality). Percentages of employ can vary accordingly, the main thing is to take advice from the Company maker: those percentages should be changed only after results taken from tests, which should be carried out by a technical Institute (see our proposal on page of the Report). Normal percentages are 0.5% for Rapisonic plant and 1% for Conventional Plants.

(7) Temperature control during consumption of emulsion should become normal routine for mill staff in charge.

(8) For Rapisonic Plants, it should be strongly recommended not to dilute previously the emulsifier in water: this will affect its chemical composition with the result of a lower impact in the emulsifier action.
Moreover, for this type of plant, which implies a % of employ of emulsifier lower than conventional plants, a correct mechanical control should be carried out as normal routine of mill maintenance;

(8) (cont.d)

the cost for replacing spare parts on those plants is absolutely not comparative with the results which can be obtained by a proper working condition of the same plant.

(9) For Conventional Old Plants, it should be recommended to control the right position of blades in the principal tank to avoid the possibility of a vacuum between the bottom of the tank and the first blade, vacuum which possibly could be filled with emulsifier (first agent to be put in tank) which therefore will not be affected by the rotating movement of blades during emulsion composition process.

TEXT RESULTS OF J. B. O. FROM DIFFERENT MILLS.

J.B.O.	DENSITY		PH	VISCOSITY	
Dacca Jute Mill	0.8456	gr/cc	6.30	9.01456	Centipoise
Bangladesh Jute Mill	0.84696	"	6.68	8.81003	"
Khulna Jute Mill (Platinum)	0.868	"	8.5	8.875	"
Chittagong Jute Mill	0.87	"	-	3.4535	"

Colour - Dark

Smell - Like Kerosine oil

Productivity Team Leader
UNDP/UNIDO

TYPES OF WATER USED IN 4 DIFFERENT PILOT MILLS

	Dacca Jute Mill	Chittagong Jute Mill	Bangladesh Jute Mill	Platinum Jute Mill
River Water		x	x	x
Condensed water	X			

EMULSIFIERS USED IN DIFFERENT PILOT MILLS

Name of Emulsifier	Dacca Jute Mill	Chittagong Jute Mill	Bangladesh Jute Mill	Platinum Jute Mill	Remar.
Nonidet P.40	x				
Hostapol (original type) imported			x		
Hostapol (bought on local market		x	x		
Issapol		x	x		
Nikanol 910				x	
Sympheronic		x			
Soft Soap			x		

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EMULSION BREAKING TEST REPORT

Name of Mills . : DACCA JUTE MILL

Type of
Emulsion Plant : MACKIE ORDINARY

Name of
Emulsifier used : NONIDET P.40

% of Emulsifier	Time taken to first breakage (in minutes)	% DECOMPOSITION						REMARKS
		After 4 hours	After 8 hours	After 12 hours	After 16 hours	After 20 hours	After 24 hours	
0.125 (Actual percentage)	20	13.5	28	29	50	53.75	56	
0.30	60	1.5	3.5	4.75	5	7	8	
0.50	180	0.5	2.25	3.25	4.25	5	6	
0.75	300	-	2	3	3.75	4.25	4.75	

X/29

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EMULSION BREAKING TEST REPORT

Name of Mills : BANGLADESH JUTE MILLS

Type of Emulsion Plant : RAPISONIC

Name of Emulsifier used : ISSAPOL

% of Emulsifier	Time taken for first breakage (in minutes)	% DECOMPOSITION					
		After 4 hours	After 8 hours	After 12 hours	After 16 hours	After 20 hours	After 24 hours.
0.38	75	10	20	35	48	61	75
0.5	120	5	10	23	31	40	52
0.75	220	3	8	20	28	37	48

Name of Mills : DACCA JUTE MILL

Type of Emulsion Plant : MACKIE ORDINARY

Name of Emulsifier used: NONIDET P.40

EMULSION BREAKING TEST REPORT

% of Emulsifier	Time taken to first Breakage (in minutes).	% DECOMPOSITION					
		After 4 hours	After 8 hours	After 12 hours	After 16 hours	After 20 hours	After 24 hours
0.125 (Actual percentage)	20	13.5	28	29	50	53.75	56
0.30	60	1.5	3.5	4.75	5	6.7	8
0.50	100	0.5	2.25	3.25	4.25	5	6
0.75	300	-	2	3	3.75	4.25	4.75

X/30 A

EMULSION BREAKING TEST REPORT

Name of Mills : CHITTAGONG JUTE MILLS

Type of Emulsion Plant : RAPISONIC

Name of Emulsifier used : ISSAFOL

[illegible]sifier	Time taken for first breakage (in minutes)	% DECOMPOSITION					
		After 4 hours	After 8 hours	After 12 hours	After 16 hours	After 20 hours	After 24 hours.
[illegible]	20	7.5	12	16	20	24	28
[illegible]5	25	6	11	14	18	22	25.5
[illegible]	35	4	10	12	16	20	24

EMULSION BREAKING TEST REPORT

Name of Mills : PLATINUM JUTE MILLS

TYPE OF EMULSIFIER PLANT : RAPISONIC

Name of Emulsifier used : Nikanol 910 with normal water.

% of Emulsifier	Time taken for first breakage (in minute)	% DECOMPOSITION					
		After 4 hours	After 8 hours	After 12 hours	After 16 hours	After 20 hours	After 24 hours
0.25	72	6	15	16.5	18	20	22
0.375	96	4.5	12	14	16	17	18
0.50	180	2	8	10	12	13	14

July 6, 1979

SOFTENING PROCESS AND EMULSION APPLICATION

The processing of jute fibre has already been lined up since many years. It is obvious that it should be well known by all the people involved in the working process of the same fibre - that naturally is the case of Bangladesh, a country where jute assume an exceptional importance.

However we think useful to reassume some fundamental ideas: the main one, which lies as basis of all the jute processing, consists to part the natural fibre in the innumerable single fibres of which the same is composed, to parallelize those fibres and to reduce and lengthen their initial section.
After this, given a certain twist, it is possible to obtain yarn of a desired count.

It is obvious that the output on quantity and quality of the complete process is higher as more correct is the putting into practice of the above concepts.

We have to remember that jute is a wooden cellulosic fibre, with many hard portions: it is delivered to the mills with its simple fibres still packed together with organic and rubbery stuff. This stuff should be eliminated to allow the single fibres to separate and to slide between them, while the hard portion of the fibre should become the most possibly elastic and flexible.

The above explanations show the ultimate purpose of the softening process, of the emulsion application and, last but not least, of the piling operation.

A - SOFTENER

- The fibre is passing through a row of heavy rollers of cast iron, which arepressed between them by strong springs. In this way, due to the mechanical work of the rolls weight and of the compressing springs, the fibre is softened, i.e. it becomes as much as possible elastic and flexible, especially in the hardest portion.
- During the softening process, at about 1/3 of the machine length from the feeding side, to the fibre is applied emulsion (we have already stressed characteristics and importance of the same in our previous report on this subject).
- We would like to recall that the softener suitable for low degree of jute quality is a hand fed machine, therefore, particularly liable to faults and lack of running uniformity.
  That means that this type of machine should carefully checked out, if we want a good processing with complete achievement of the main purpose.

On the following we intend to go over the main points for a correct softening process:

1) Feeding: It should be the most uniform and constant as possible. We recall the need that the workers feeding the machine should get the morrahs selected as more as possible inside definite weight limits (see our previous Report on the subject). The feeders should work with an uniform rhythm, trying to cover the feeding cle almost totally, without gaps between morrahs and without overlapping.
   Very often we noticed in fact that the feeding is done only in the central zone, with negative consequences that we will point out later on, on this same Report.

2) Speed of the Machine: It should be as much as possible proportional to the feeding speed of the workers in charge of the machine.
As an example if we suppose that two workers are able to feed an average of 10 morrahs by minute and that a single morrah will reach an average length of 1.67 yds., then the optimal speed of the feeding cloth should be about 17-18 yds. per minute.
The delivery speed of the machine should be higher, in connection to the feeding speed, of about 10%.
Referring to the above example therefore the delivery speed should be of about 19-20 yds. per minute.

3) Emulsion Application: It should be applied in a way to soak in an uniform manner all the fibre passing through the machine, reducing meanwhile to a minimum the emulsion losses.

It should be kept clearly in mind, for not deceiving anybody, about the quantity and the quality of the emulsion recovery, that the same could be only partial and it is formed by a product polluted by dust, wooden remainings of the fibre, etc.

The emulsion flux should be proportional to the jute flux passing through the machine.

We remember that the purpose of the emulsion application is to supply to the fibre the correct percentage of oil, according to the different quality of the fibre itself. Generally speaking, the correct percentages of oil are the following:

. for soft jute : 4 - 5 %
. for Mestha : 6 - 7 %
. for hard jute and cuttings: 8 - 9 %

- The softeners should be provided with stop motion equipment to the emulsion flow, in case of complete stoppage of the machine
- It is also advisable never to run the machines idle, with an open emulsion flux - the loss of emulsion will be total.
- Referring to the example at Paragraph 2), supposing an average weight of morrahs about 2.25 lbs. each, the feeding will be:

  10 morrahs/60" x 2.25 lbs. = 22.5 lbs/minute.

  Supposing an emulsion with a content of 20% of oil and a desired application on fibre of 5% of oil, then the emulsion application should be:

  $$0{,}20 \times X = 0{,}05$$

  From which we deduce X = 25%.

  If we allow an emulsion loss through the machine of about 10%, then the needed total emulsion flux will be:

  $$Y = 22.5 \times 0{,}25 \times 1.1 = 6.19 \text{ lbs/minute.}$$

- In case of an emulsion made by a RAPISONIC plant and sprayed by a Fraser Metering Unit, we should remember that emulsion made by such plants is formed by 50% oil and 50% water. Then the 2 metering unit valves should be adjusted in such a way to obtain:

  Emulsion flux = 40% of the total

  so:

  $$\frac{40}{100} \times 6.2 = 2.48 \text{ lbs/60"}$$

  Water flux = 60% of the total

  so:

  $$\frac{60}{100} \times 6.2 = 3.72 \text{ lbs/60"}$$

To control if the above calculation is correct, we will follow the opposite way:

2.48 lbs. contain 1.24 lbs. of oil (0%)

if we deduct a 10% of losses, we will have:

$$1.24 - 10\% = 1.12 \text{ lbs.} = \frac{1.12}{22.5 \text{ lbs}/60''} = 5\% \text{ oil.}$$

4) Mechanical Conditions

Softeners are very simple and heavy machines, which are able to run without much care: just for this reason, the mechanical faults are often omitted.
Above all care should be taken so that:

- the springs should be all equal and uniformally adjusted
- the rollers should not be worn out beyond a certain limit and mostly they should not be oval, due to feeding faults.

B - SPREADER

This type of machine has been brought up in the Fifties and has in great measure replaced the older softeners.

The spreader is following a different technological idea: instead of the mechanical work of weights and springs, to the fibre will be given a first coarse action of carding and drawing.
By this we will reach a first cleaning of the fibre from wooden remainings and an initial opening of the primary fibres, with beginning of the process of parallelising and reduction in section of the same fibres.
All this will be reached by passing the raw fibre between 2 chains, a slow one and a fast one, provided with bars and coarse pins.

From the processing point of view, we think the spreader suitable for jute of a medium/high degree of quality.
This machine, really, shows the following advantages in comparison to the old softeners:

- reduction in manual faults on feeding, during the following process steps (see carding process),
- better application of emulsion, with less wastages,
- better piling, because it will be formed by compact rolls, obtaining in the meantime the result of a cut in the space needed for the operation, space often lacking in the mills lay-out
- more productivity.

As a consequence, if the machine is running in a correct way, it is possible to obtain notable improvements in the regularity of all the following process and therefore, in productivity itself.

Spreader, in spite of being a heavy machine, needs a very careful maintenance: specially for chains, pin bars and roll formers.
For this reason all those parts should be checked regularly and overhauled in proper time. Normally spare parts for spreaders are quite expensive: this can explain, but only in part, the trend, which we noticed in the mills, to neglect the maintenance.
Simple technical-economical considerations can easily show that the money involved in the purchase of spare parts for spreaders will be quickly amortized by the higher production of the machine itself and by the drop of wastages.

TEAM ADVICES

1) The workers assigned to the softeners feeding should be trained for long period to a feeding rythm the more uniform as possible.

2) The feeding speed of softeners should be proportional, as far as possible, to the average total length of the fibre which is going through the machine.
In this way gaps will be reduced to the very least.
As is clearly shown on pages X/43 and X/46, a double feeder is essential, on all the mills.

It is worthwhile to remember that reducing gaps on the feeding cloth is one of the main factors to decrease emulsion wastages in the softening process.

3) The delivery speed should be higher in comparison to the feeding speed of about 10-15%.
In this way jumps will be reduced at the very least, with consequent improvement of the efficiency of the machine.

4) The percentage of oil, which should be applied to the fibre, should be predetermined. From this datum the percentage of oil in emulsion will be worked out, and consequently the flow of emulsion.

5) Flow Chart of emulsion, or emulsion and water, coming from the distribution valves, should be recorded in every mill for each machine: the flow should be checked to control the constancy and continuity of the same with time.
We will point out in this connection the need of accurate cleaning on the application plant (see page X/47)

6) Once the distribut n valves will be calibrated on the grounds of requirement, from time to time it should be checked if the quantity of emulsion applied is in conformity with the desired quantity.
Only slight adjustments on the valves calibration will be then necessary to obtain the desired amount.

7) It should be remembered that the final purpose of emulsion application is to apply oil on fibre in the most uniform way and in the required quantity.
Some application systems checked on some mills are absolutely wrong and not economic.

Remarks on Tables appearing on pages X/43 to X/46 - Softeners

X/43

Dacca Jute Mill

Softeners No. 1 and No. 2 are showing too high speed, both for feeding and delivery side.

A) On feeding side, with a single feeder and with an average feeding ratio of 6.70 morrahs/minute, we will have:

Morrahs 6.70 x 1.70 yds. (average length of fibre) = yards 11.4/minute against an actual feeding speed of machine of 25.5 yds. on softener No.1 and 23.5 yds. on softener No. 2.

ESSENTIAL ADVICE IS TO RESORT TO A SECOND FEEDER - In this way the average feeding ration will raise to 12 morrahs/minute - then -

Morrahs 12 x 1.70 yds. = Yards 20.4/minute

Second step will be of reducing the speed of softener No. 1 at least to the same speed of No. 2, i.e. to 23.5 yards per minute.

B) On delivery side, taking a lead from 10 to 12%, the speed should be consequently reduced to about 28 yards/minute.

X/44

Chittagong Jute Mill

On this mill, double feeding on softening is already normal way of processing.
If we assume the figure of 15 morrahs on the average feeding ratio, then the feeding speed of the machine is correct (15 morrahs x 1.70 yds. = 25.5 yds/minute).
Instead the delivery speed should be slightly decreased, to about 31 yds/minut

X/45

Platinum Jubilee Jute Mill

A) On feeding side, with a single feeder and with an average ratio of feeding of 8 morrahs/minute, we will have:

Morrahs 8 x 1.70 yds. = yds. 13.60/minute against the actual speed of about 18 yds.

ESSENTIAL ADVICE IS TO RESORT TO A SECOND FEEDER, with an increased feeding ratio of 12/13 morrahs/minute.

Then: Morrahs 13 x 1.70 = 22 yds/minute.

Second step will be of increasing afterwards the speed of softener to about 24 yds/minute.

B) On delivery side, the speed should be increased accordingly to about 28 yds/minute.

X/46

Bangladesh Jute Mill

A) On feeding side, with a single feeder and with an average ratio of feeding of 5.8 morrahs/minute, we will have:

Morrahs 5.8 x 1.70 yds. = Yds. 9.90/minute against the actual speed of the machine of about 18 yds.

ESSENTIAL ADVICE IS TO RESORT TO A SECOND FEEDER: Then, morrahs

Morrahs 13 x 1.70 = 22 yds/minute.

The machine speed will be increased accordingly to about 24 yds/minute.

B) On delivery side, the speed should be increased afterwards to about 28 yds/minute.
The actual ratio between feeding and delivery side is too low, with high possibility of jams.

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SOFTENERS = DACCA JUTE MILL

No. of Machine	SPEED (Yds/Minute)			FEEDING			Yards on feeding	Type of Jute Batch
	Feeding	Delivery	Ratio Delivery / Feeding.	No. Feeders	No. Morrahs/minute Short Time	Long Time	Morrahs fed	
1	25.5	35.6	1.40	1	9	6.60	2.83	BWC Cut
2	23.5	35.6	1.51	1	10	6.80	2.35	BWC Bottom
3	30.2	35.1	1.16	1	-	-	-	Cuttings

SOFTE...

No. of Machine	SPEED (Yds/Minute)		
	Feeding	Delivery	Ratio $\frac{\text{Delivery}}{\text{Feeding}}$
1 to 5	27.33	33.67	1.232
1	27.00	33.20	1.23
2	27.55	33.90	1.23

ERS = CHITTAGONG JUTE MFG. COMPANY, LTD.

No. Feeders	No. Morrahs/minute Short Time	Long Time	Yards on feed / Morrahs fed	Type of Ju Batch.
2	15.3	12.22	2.24	(Mill No. 1)
2				(Mill No. 2)
2				(Mill No. 2)

X/44

SOFTENERS

No. of Machine	SPEED (Yds/minute)		
	Feeding	Delivery	Ratio $\frac{\text{Delivery}}{\text{Feeding}}$
2	18.32	19.69	1.075
3	18.32	19.69	1.075
4	18.53	18.77	1.013
5	18.32	19.22	1.049

= PLATINUM JUTE MILL

No. Feeders.	No. Morrahs/minute		Yards on Feeding / Morrahs fed	Type of jute Batch
	Short Time	Long Time		
1	10.9	7.68	2.39	White X Bottom
1	10.5	7.78	2.35	Mestha
1	10.35	8.73	2.13	Tossa X Bottom
1	10.6	8.95	2.05	Tossa X Bottom

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SOFTENERS - BANGLADESH JUTE MILL

No. of Machine	Speed (Yds. /minute)			No. Feeders	Feeding No. Morrahs/minute		Yards on feed / Morrahs fed	Type of jute Batch.
	Feeding	Delivery	Ratio Delivery / Feeding		Short time	Long time		
2	18.34	18.56	1.01	1	8.3	5.4	3.16	Uncut Jute.

VARIATIONS ON FLOW TAKEN FROM SOFTENER NO. 5 AT PLATINUM JUTE MILLS.

	Checking on 11/6	Checking on 19/6	Variations
Emulsion	184.8	200.4	+ 8%
Water	136.8	160.2	+17%
Total	321.6	360.6	+12%

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Remarks
The checking on 11/6 was made **before** cleaning of applicetion plant.
The checking on 19/6 was made **after** cleaning of application plant.

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We take in consideration Softener No. 1 of Mill No. 2 -

2 Feeders = 12 morrahs/minute (average) x lbs. 2.25 (average morrah weight) =

27 lbs/minute x 60 = 1620 lbs/hour.

Emulsion application = 25%

Then, emulsion applied on 1620 lbs./hour = 405 lbs/hour.

Valves setting =

Emulsion	60 ----------	4.14 lbs/minute	=	248.40 lbs/hour.
Water	90 ----------	9.05 lbs/minute	=	543.00 lbs/hour
		Flow Total		791.40 lbs/hour

With $\frac{0.5 \text{ (Ranisonic plant) } \times 248.40}{791.40}$ = 16% oil in emulsion

Oil in fibre = 0,16 x 0, 25 = 3.92

This percentage is too low, it should be 5 % = having a 16% oil in emulsion, then the application should be :

$$\frac{5}{16} = 31\%$$

This application could be reached or increasing the covering of feeding cloth or increasing the emulsion flow - Wastage calculation :

Long Jute 1 Ton (2240 lbs)

Emulsion lbs 1094 $\left(\frac{\text{lbs } 2240}{\text{lbs } 1620} \times 791 \text{ lbs}\right)$

(Application 25%)

Emulsion applied 560 lbs +

Jute 2240 lbs

2800 lbs.

534 lbs wastage

(1034 - 560)

694 Fresh Emulsion

(560 + 134)

400 ---------------- Recovered Emulsion (75

Emulsion applied 560

534 ---------------- 134 final wastage (25%

Input = 694 +(63%)

400 +(37%)

1094

Output = 560 + (Emulsion fresh applied ------ 51%)

400 + (Recovered emulsion ------ 37%)

134 + (Wasted emulsion ------ 12%)

1094

PLATINUM JUTE MILLS

We take in consideration Softener No. 5

1 Feeder = 7 morrahs/hour = Morrahs 7 x 60 x 2.25 lbs. = 945 lbs/hour.

$\frac{\text{1 Ton jute (lbs 2240)}}{\text{lbs 945}}$ = 2.37 hours/Ton.

In 2.37 hours the flow would be = 2.37 x lbs 321.60 (flow/hour) = 762.31 lbs.

Balance : Raw Jute 1 Ton (2240 lbs) Emulsion (762.31 lbs)

(Application 18.5%)

Emulsion	414.4 +	348 lbs wastage
Jute	2240.0	(762-414)
	2654.4	

Fresh emulsion 501 lbs (414 + 87) 261 Recovered emulsion (75%)

Emulsion Balance

Emulsion applied 414 lbs 348 wastage 87 final wastage (25%)

Input =	501	(66%)	Output =	414.0 +	(54%) emulsion applied
	261	(34%)		261	(34%) Recovered emulsion
	762			87	(12%) Wasted emulsion
				762	

PILING

By M. A. Jalil
National Counterpart
UNDP/UNIDO Productivity Team

What is Pile : The Pile is the storing and conditioning of emulsified jute, cuttings, or spreader rolls in a layer upon layer into a stack and well covered with heavy cloth for optimum period to help bacterial growth for softening the piled jute.

Purpose of Pile

Sometimes jute is a hard, rooty, sticky, harsh as well as contains wood portions and naturally its spinning properties are somewhat affected along with its cohesiveness and pliability during processing. If jute is carded and spun into a yarn in its natural state, a hairy yarn will result with short fibre waste during processing and also it will obstruct better carding. Production efficiency will be very less with higher cost.

Therefore, to process jute fibre successfully with minimum waste as well as cost, it requires to be softened i.e. its stiffness should be removed. For softening the jute, emulsion is applied on them with required percentage during processing in the softener or spreader machine. The delivered jute from the softener is kept into a pile for necessary conditioning to reach the highest temperature.

During the piling period the bacterial activity softens the hard rooty portion of jute making it suitable for better and easier carding. The heat which is generated arises from the growth of micro-organisms left on the fibre after retting. Though the actual action is not understood, it is thought that micro-organisms oxidize some of the natural fats and waxes in the jute which generates heat in the pile.

Quality of jute	Time	Temperature in °C
1. Spreader Rolls	At least 48 hours	45 - 55
2. Best quality and soft jute	3-4 days	55 - 60
3. Hard Jute and Mestha	6-7 days	60 - 65
4. Cuttings	10-12 days	70 - 75

The piling temperature test should be taken by Quality Control man twice in a day for each and every pile and to inform the Batching Dept. in charge ensuring the clearance for opening the pile in time and making new piles according to requirements for maintaining proper batch.

It is known that heating is stimulated by the following factors:

1. Applying hot emulsion with required percentage
2. Using a protein activated emulsifying agent which provides a readily assimilated food supply to the micro-organisms.
3. Right pressure and well coverd piles.
4. Piled in a draught free site.
5. Slatted floor for cutting bins to allow a gentle circulation of air which encourages in heating.
6. Outside atmosphere of the pile (in different period of the year).

The optimum conditioning period of a pile to reach the highest temperature is called full maturity time.

Addition of more piling for more time than optimum causes over batching resulting in darker colour and weaker in strength, whereas opening the pile beforematurity is called under batching which causes improper carding, hairiness in ultimate process, loss of production efficiency and increasing wastage as well as production cost.

PILE TEST REPORT

Quality of Jute	Emulsifier & percentage		Name of the Mill	Maturity period in hours	Highest Temp. °C	Remarks
W.X.Bot	Issapool	.25%	CJMCL	168 hrs.	62°C	
W.X.Bot	Nikanile 910	.375%	Platinum	-	-	
W.X.Bot	Nonidet P-40	.15%	DACCA	120	58°C	
W.X.Bot	Hostapol	.25%	Bangladesh	160	64°C	
W.C.Bot	Issapool	.25%	CJMCL	144	61°C	
T.X.Bot	Nikanile 910	.375%	Platinum	144	59°C	
W.C.Bot	Nonidet P.40	.15	Dacca	168	59°C	
W.C.Bot	Hostapool	.25%	Bangladesh	104	60°C	
B.W.C.	Issapool	.25%	CJMCL	96	48°C	
B.W.D.	Nikanile 910	.375%	Platinum	96	60°C	
B.W.C.	N.P-40	.15%	Dacca	120	38°C	
B.W.C.	Hostapol	.25%	Bangladesh (Example of over maturity)	240	43°C	Max. time taken
MesthaC.Bot	Issapool	.25%	CJMCL	144	70°C	
MesthaC.Bot	Nikanile 910	.375%	Platinum	144	64°C	
-	-		Dacca	-	-	
-	-		Bangladesh	-	-	
Cuttings	Issapool	.25%	CJMCL	216	67°C	
	Nikanile 910	.375%	Platinum	-	-	
	N.P-40	.15%	Dacca	120	58°C	Opened before maturity
	Hostapol	.25%	Bangladesh	185	63°C	

WAY OF PROCESSING CUT AND UNCUT JUTE

By Mr. L. Galletti
Member of Productivity Team
UNDP/UNIDO

Two main types of jute are processed normally in the Spinning Department:

A) Soft cut jute: i.e. jute with minimum percentage of runners and roots.

B) Uncut jute: i.e. jute with a percentage of roots, which can easily be assumed as for 25% of total length of fibre.

In our opinion it is not advisable to process those two types of fibres in the same way: too many different factors are involved which should be taken in account as in the following:

Cut jute

- percentage of oil = 5% (on total length of fibre)
- percentage of emulsion application = 20-25% (on total length of fibre)
- period of piling = 4-5 days (for total length of fibre)

Uncut jute

- percentage of oil = 5% on soft part (75%)
  8% on hard part (25%)
- percentage of emulsion application = 20-25% on soft part of fibre
  30-35% on hard part of fibre
- period of piling = 4-5 days on soft part of jute
  10-12 days on hard part of jute.

Furthermore, on carding processing, it should be taken into proper account the difference between carding a soft jute instead of carding rooted jute: not only the number of passages in the carding unit varies, but the setting and gauges of each card varies also.

WAY OF PILE

The piles are usually made on a special Pucca floor. All the piles should be well covered with heavy cloth to prevent moisture evaporation and to retain heat for proper batching action. Piles should be made nicely with rectangular shape. Emulsified jute morrah is to be folded in such a way so that the tail portion does not go to the root portion. After that the morrah is twisted at the folding centre and placed one upon the other to make a pile. After making every one foot height of a pile it is required the necessary pressure on them by means of man's foot, wooden bar or any other extra weight in order to make the fibre compact so that the open air should not pass through the pile. An identification card should be attached on each pile showing the quality of jute, closing date and time of the pile. Each pile should be placed in strict rotation to ensure uniformity in batching. Each grade of jute should be piled separately.

Standard dimensions of the pile are as follows:

Long Jute = 16' x 6' x 6' = 576 cu.ft. = 576 + 6 = 96 maunds
Cuttings = $18\frac{1}{2}$' x 6' x 9' = 999 cu.ft. = 999 + 6.25 = 160 maunds.

DURATION OF PILE

Piles of different grades of jute require different time and temperature for full maturity of jute fibre. From the various tests taken by our team, it is found that conditioning period of the pile for reaching the highest temperature varies from mill to mill, various reasons lies behind it, such as quality of emulsifier, oil, emulsion stability, percentage of emulsion as well as oil applied on jute etc.
But the optimum conditions we suggest are the following ones:

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Due to all these factors, and considering the need of using in good batches (Hessian warp) a certain amount of uncut jute, we consider it essential to process these 2 types of fibres in different ways.

We will recommend to follow the following working scheme:

CUT JUTE

a) Spreader
↓
Piling (48 hours minimum)
↓
Breaker card
↓
Finisher card (for final batch)

b) If spreader is not available:

Softener
↓
Piling
↓
Breaker card
↓
Finisher card (for final batch)

UNCUT JUTE
↓
cut roots
↓

Soft part
↓
Spreader or Softener
↓
Piling
↓
Breaker card

Roots
↓
Softener
↓
Piling
↓
Teaser Card
↓
Breaker Card
↓
Intercard

Finisher card for final batch

Our final opinion is that, in any case, the spinning department would increase its spinning efficiency and furthermore the yarn produced will be of quite improved quality.

ANNEX XI

From daily newspaper "BANGLADESH OBSERVER" dated 2/2/1980

UTILISATION OF JUTE

Recent researches conducted in the Karnaphuli Complex have, according to a report, shown that jute sticks can be effectively utilized as raw materials for manufacturing white paper. This is really encouraging. So long jute sticks are being utilised only for producing partex. The prospect of utilisation of jute sticks for producing paper would help ease supply of raw materials to the Karnaphuli Paper Mills which find it sometimes difficult to procure an adequate amount of inputs for manufacturing purposes. Bamboo and some selected timber are at present utilised as raw materials for manufacture of paper in the mills.

There is a bright prospect for new uses of jute. This would open up a new vista of opportunities for our jute on the international market. Jute is already being used for many purposes other than those of hessian and sackings. According to available statistics, rapidly growing market consists of various types of floor and wall covering made from jute which are in demand both because of their cheapness and durability. Among the floor covering materials a new product may be mentioned consisting of a cork base under a layer of reinforced jute hessian and topped with vinyl surface. The demand for jute as a direct floor covering material in large areas is likewise increasing rapidly.

In a similar way the demand for wall lining made of jute fabric is expanding, particularly as a material for exhibition, stands and painted murals. In India extensive work has been done in the development of jute as a fabric for making curtains and covering furniture. The demand for these fabrics, which are printed in very attractive designs, is row very strong.

The use of jute in coated roofing materials is expanding while recently some experiments were carried out in using large areas of asphalt coated jute fabric as a material to line irrigation canals - a field which needs further experiment.

In the industrial countries an entirely new field is opening up in the reinforced plastics as well as coating jute fabrics with plastics. This use of jute cloth as a reinforcement for polyester resins in laminated materials offers good prospects. Fibre glass is extensively used for this purpose; but jute is cheaper and more suitable where great strength is not required. Another area of promise is the blending of jute with man-made fibre in making various types of yarn to reduce cost and improve durability. Additional possibilities may be found in the transformation of jute through a pearlising process which, according to research of a foreign firm, gives jute such a beautiful appearance that is no longer recognised as jute. Other advantages include greater durability and a relatively low cost of the process.

Among the many other industrial applications are wide cloth for linoleum backing, for incorporation as a core in electrical and other cables, concrete curing blankets in road building, tapes to retain springs in furniture and automobile upholstery and brattice cloth for cargo separators on ships, etc.

In those countries where industrialisation is relatively recent, and where pockets of "under-development" still exist, demand for jute will almost certainly continue to rise rapidly with the growth in the gross national product.

We should, however, pay heed to the threat of substitutes, particularly polypropylene, which appears to pose the greatest threat to jute. Oil price like this, of course quite likely to discourage the substitutes for jute.

Considering these factors vigorous efforts should therefore be made to develop new uses of jute in the country and find out a lucrative outlet.

Simultaneously optimum utilisation of jute cuttings in our mills has to be ensured. A huge backlog of cuttings has become a big liability for the jute trade and industry. It is about one fourth of the total 50 to 60 Lakh bales of jute produced in the country. The technological wing of the Bangladesh Jute Research Institute has a great responsibility in this regards.

ANNEX XII

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MINUTES OF THE MEETING HELD ON 5.7.79 AT 9.30 A.M. IN THE OFFICE ROOM OF MR. MAZZALI BETWEEN MR. A.M. AMINUL HAQUE, GENERAL MANAGER (PP), MR. MAZZALI, UNDP/UNIDO PRODUCTIVITY TEAM LEADER, MR. GALLETTI THE UNIDO PRODUCTIVITY CONSULTANT & MR. A. ALI, GENERAL MANAGER, BANGLADESH JUTE MILLS LIMITED

Mr. Mazzali started by pointing out that Bangladesh Jute Mills Ltd. was not maintaining uniformity in Morrah Weight. As there was wear and tear on the roller faces of the softener it was discussed and resolved that for uncut jute Morrah (dipped in emulsion) weight will be maintained from 3lbs. to 3.5 lbs. for better squeezing effect until overhauling of the softener machine is completed. It was also agreed that for Hessian Warp quality, cut jute Morrah weight will be maintained from 2 lbs. to 2.5 lbs.

Mr. Mazzali mentioned that quality control test results on emulsion stability in Bangladesh Jute Mills were not correct. He also said that emulsion should remain stable for at least 24 hrs. He requested the General Manager, Bangladesh Jute Mills to look into the matter personally.

It was agreed that, for Rapisonic type, if the emulsion is not found stable with 0.5% emulsion, it can be increased up to 0.75%.

It was suggested by Mr. Mazzali that for Hessian warp, cut jute should be piled at least for 2 days. For Hessian weft & Sacking warp he suggested that uncut long jute should be cut before passing through softener and the cut jute and cuttings are to be processed and piled separately. The final blending is to be done on finisher cards.

It was agreed by all to run, as test case.on two spinning frames as per the suggestion of the UNIDO Consultants.

It was discussed for emulsion plants, whether rapisonic or ordinary type, the % of emulsifier needed according to requirement and to maintain the standard stability of emulsion (1% suggested for ordinary agitator type plant, 0.5% for Rapisonic).

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Soft Soap: - (Locally manufactured) it is not used as as possible. If the mill, for a short time needs to use soft soap, it should be remembered that the percentage should vary from 3 to 5 times higher than standard emulsifier depending on the quality of the material.

It was agreed that the mill should try to get full benefit from rapisonic plant and the ordinary plant should be used only for emergency.

It was agreed that test results on new experiment will be compared with those of previous experiment on emulsion preparation and its application.

Emulsion application in spreader: - The General Manager of Bangladesh Jute Mills assured that spray system will be introduced within one months time.

Application of emulsion: - Mr. Mazzali said that dipping system of process, where average emulsion application shows 45%, is too high. Mr. Mazzali did not agree with the dipping system process. For cutting application of oil should be 8 to 9% and piling period for 8 to 9 days. It should be teased on Teaser, passed through breaker and intercarded and finally blended on finisher cards.

Piling procedure : It was agreed that piling of spreader rolls should be for at least 24 hours. It was pointed out and suggested that in order to utilise 2 spreaders 4 breakers should be kept on roll feed.

At present Bangladesh Jute Mills has 3 breakers on roll feed.

Quality Control Report: - It was decided that, in future, the quality control report should be corrected and signed by the Production Mgr..

Reporting System: - G.M., Bangladesh Jute Mills informed that he could not fully agree on the report sent by counterpart. G.M (PP) gave instructions that in future all reports related to activities of

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the mills and the National counterparts working in the mills sent by any official, should be signed and countersigned by the officers of both the parties namely mills and UNIDO representatives.

1. Mr. A.M. Aminul Haque, General Manager (PP) BJMC.
2. Mr. Mazzali, UNDP/UNIDO Productivity Team Leader
3. C.O. to Director (PP), BJMC
4. Mr. A. Ali, General Manager, Bangladesh Jute Mills Ltd.
5. Mr. Serajul Islam & Mr. Bhawal, UNDP Counterparts, Bangladesh Jute Mills.
6. Mr. Galletti, UNDP Productivity Team Leader
7. File.

ANNEX XIII

BANGLADESH JUTE MILLS LIMITED

GHORASAL : DACCA

IMPLEMENTATION REPORT OF UNIDO PRODUCTIVITY TEAM

1. Increased % of Emulsifier up to 0.5% (Nonidet P-40).
2. Training is being imparted to make regular & correct size of morrah .
3. Worn out fluted rollers of softener machine have been replaced.
4. Proper tension of softener fluted rollers is ensured after changing the worn out spring & gauging the spring.
5. Compressor of spreader rollers has been introduced after repairing the old compressor m/c.
6. Worn out slides & bar of slow & fast section of spreader m/c have been replaced.
7. Uniform feeding of spreader m/c has been ensured after repairing the weighing scale & pointer.
8. Increased roll pile of spreader m/c.
9. Pile temperature is ensured after proper application of stable emulsion of different kinds & qualities of Jute.
10. Proper pile cover is given & piles are trampled regularly to generate heat.
11. Slides of spreader m/c are properly lubricated.
12. Proper feeding & softener & spreader m/c is ensured so that mangling action on jute may be carried out uniformly, workers have been trained to feed the materials right across the width of feed roller.
13. Dollop weight of both spreader & breaker card have been introduced and regular inspection is being carried out to feed the materials in order to keep the weight per unit length uniform.

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14. Schedule steping programme of carding machine is carried out properly, cleaning & setting of different rollers of carding machines is being done properly.

15. Gulping is being checked from shell & machine & worn out shell have been replaced.

16. The locally made tin cylinders are getting bent frequently & steps have been taken to repair the same.

17. Worn out fleece guide & faulty conductors are gradually being replaced & fleece is checked regularly.

18. Broken & bent pins of faller bar of drawing frames are being replaced & daily inspection is carried out by quality control personnel.

19. Adjusted pressure of pressing rollers and faulty pressing is avoided.

20. Lead of different rollers of special carding & drawing frames are being checked.

21. The surface of faulty pressure rollers is ground to make it smooth.

22. Micro switch of drawing has been installed to have correct stop motion.

23. Lap & choke have been reduced by a careful watching of the percentage of emulsion applied to the fibers in the batching process.

24. Faller bars are throughly picked once every shift of 8 hrs. by picking coolies.

25. Proper weight has been given to crimping box so that fibre cohesion can be increased.

All our efforts have been taken to improve the quality of yarn & to boost up spinning production to keep the Batch cost at minimum level.

COUNTERPART | PRODUCTION MANAGER
UNIDO

S. ISLAM

ANNEX XIV

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REPORTS ON IMPLEMENTATION OF SUGGESTIONS OF UNDP/UNIDO PRODUCTIVITY TEAM IN DACCA JUTE MILLS LIMITED, D A C C A

1. JUTE MORRAH AND MORRAH WEIGHT:

Productivity Team proposals as regards "MORRAH MAKING" within specificed range and its control including the training of the Jute Assorters have already been implemented. As the "MORRAH MAKING" is being done manually on the basis of assessment, pretty long time is naturally required to get the concerned workers fully trained though some good results have already been achieved by this time. Mill Management have accepted the advice in this regard in right earnest and determined to maintain the same.

2. E M U L S I O N:

Advice of Productivity Team in connection with Emulsion, its preparation and its ingredients have already been implemented in DACCA JUTE MILLS except the use of condensed water. At present hot water is added to the mixture. The use of condensed water will not be feasible until some Treating Plant is installed. Mill Management assures that in future, however, attempts will be made to implement this particular point.
Initially in DACCA JUTE MILLS only 0.13% of Emulsifier (i.e. Nonidet P-40) used to be mixed in the preparation of Emulsion with very little stability and the use of the same has already been increased to 0.5% with much better result though it fluctuates with the quality of JUTE BATCHING OIL supplied time to time. The Mills Management hope to increase the percentage of NONIDET P-40 up to 1.0% in future after ensuring sufficient stock of the same in hand.

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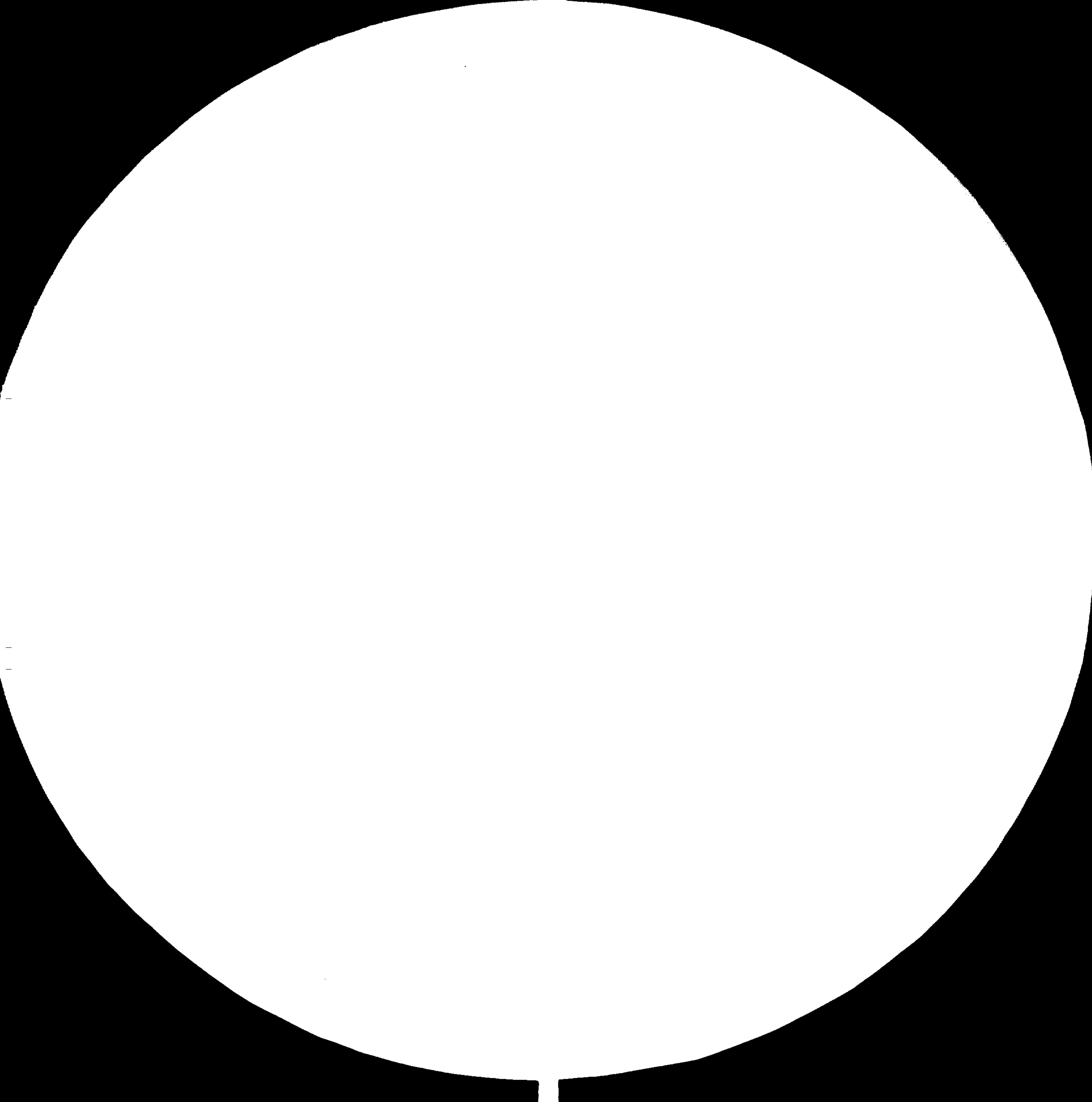
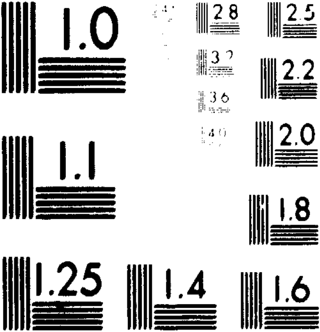
81.11.30





MICROCOPY RESOLUTION TEST CHART

NATIONAL BUREAU OF STANDARDS-1963-A

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3. EMULSION APPLICATION & WASTAGE:

Since the period of stability of Emulsion has been increased by making better mixture as per Guideline given by the Productivity Team, the uniformity of application of Emulsion to the Fibre has been improved a lot and P.C. Oil application to the hard & soft portion of Jute in now more or less maintained to the required proportion as suggested by the Team. While other suggestions such as uniform feeding by double feeder in Softener Machine, uniform feed speed in proportion to the speed of the attendants, minimisation of feeding gap, uniform flow of Emulsion etc. have already been implemented in DACCA JUTE MILLS in accordance with the advice of the Team.

As most of the suggestions of the Team regarding Emulsion & its application have since been implemented, the percent of Waste Emulsion has also been greatly minimized and attempts will be made to further reduce the same in future.

4. PILING AND PROCESSING:

In accordance with the suggestions of the Productivity Team, proper Piling of Jute has already been introduced and the number of Piles has also been increased to meet the requirement and no direct Jute is run into the Carding Machines.

Temperature of the Pile of Soft Jute is not yet maintained to the range (i.e. 65° to 70°C)specified by the Team but it nearly reaches the required standard while the Temperature of the Cuttings is used to be maintained to required level i.e. 75°C to 80°C.

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4. (cont.d)

The very important factor of processing of Soft & Hard portion of Jute separately has not yet been fully materialized due to problems of Assorting Space and shortage of trained skilled Assorters. It was introduced in Hessian Warp only temporarily and the working efficiency attained was comparatively higher but it could not be maintained due to non-availability of required quantity of Clean Cut Jute. But the Mill Management has accepted the importance of the idea of treating soft and hard portion separately and same will be implemented as soon as the problems, as stated above, are sorted out.

5. B E A M I N G:

Suggestions as regards changing of certain position of Spools in the Creel to have proper and uniform tension of Yarn has been accepted by the Mill Management and the change of the Creel is in process of implementation at this particular point.

6. S U P E R V I S I O N:

Effective supervision has been ensured, as far as practicable, to attain better Quantity and Quality.

C O U N T E R P A R T S:

UNDP/UNIDO PRODUCTIVITY TEAM

LEADER COUNTERPART

UNDP/UNIDO PRODUCTIVITY TEAM

Copy to: 1. The Dy. General Manager
the Dacca Jute Mills Ltd.,
Hashnabad (Dacca)

(KAZI REZAUL HASAN)
DEPUTY GENERAL MANAGER

DACCA JUTE MILLS LIMITED

ANNEX XV

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s.p.a.

17th November 1979

PLATINUM JUBILEE JUTE MILLS LTD. - TOWN KHALISHPUR : KHULNA

A meeting was held in the Board Room of the Platinum Jubilee Jute Mills at 11.30 a.m. on 17.11.1979. The following Officers of the Platinum Jubilee Jute Mills and officers from UNIDO / UNDP Productivity Team were present in the meeting :

1) Dr. R. Mazzali, Team Leader, UNIDO / UNDP Productivity Team.
2) Dr. L. Galletti, Member, Productivity Team, UNIDO / UNDP.
3) Mr. A.K.M. Shamsuddin, General Manager, Platinum Jubilee Jute Mills Ltd. Khulna.
4) Mr. Nazrul Islam, Dy. Chief Accountant, Platinum Jubilee Jute Mills Ltd., Khulna.
5) Mr. F. Kibria, Production Manager, Platinum Jubilee Jute Mills.
6) Mr. Kamaluddin Ahmed, Sr. Asstt./National Counterpart, UNIDO / UNDP.
7) Mr. Nasiruddin, Senior Asstt., Mill No. 1, Platinum Jubilee Jute Mills Ltd.
8) Mr. Khairul Basher, Mill Asstt./Counterpart, UNIDO / UNDP Productivity Team.
10) Mr. Mazhar, Mechanical Engineer, Platinum Jubilee Jute Mills Ltd.
11) Mr. A. Kalam, Asstt. Engineer / Counterpart, UNIDO / UNDP Productivity Team.
12) Mr. Hafizur Rahman, Quality Control Officer, Platinum Jubilee Jute Mills Ltd.

Mr. Aminul Haque, General Manager, Production Planning, BJMC, was in the chair.

At the very beginning, Mr. Aminul Haque, narrated the importance of UNDP / UNIDO Productivity Team and their works and other aspects. Regarding the final report of UNIDO / UNDP Productivity Team for Platinum, he requested the Production Officers, Engineer and Quality Control Officer to go through the reports very carefully and to implement the proposals given by the above team.

The Production Manager, Senior Asstts., Engineer and Quality Control Officer gave their consent of going through the report properly so that, the implementation of UNIDO proposals may be easier.

Mr. Aminul Haque asked Mr. Mazhar, Engineer, regarding the machinery conditions and what suggestions he had received from UNIDO.
In reply he said that the final report had not yet reached his hand. However, he will collect the proposals of UNIDO from Mr. Kamal Uddin Ahmed as well as from the final report.

Mr. Aminul Haque pointed out some essential proposals on morrah weight. It was also discussed that the Platinum's Jute Morrah weight had been improved a lot. The quality control officer and the head of the Batching Department were asked to do the morrah test jointly and regularly.Mr. Mazzali and Mr. Galletti pointed cut and requested to do the Morrah test on an operative basis at least 2 (two) tests (two assorters in each day), so that the necessary action may be taken to regularise the morrah weight. They also mentioned that the Morrah test on random basis in the Batching Deptt. has its demerits as this does not allow to identify the particular assorter who is a bad assorter. To modify the weight, fed by hand by the Assorter, the morrah test on assorter side is to be done. And from the Test results individual Assorters may be trained up or if necessary any action may be taken against the defaulter.

As it was found in the final report that the emulsion test report was uneven, the Paltinum personnel was asked to do the same test regularly with proper attention.

The stability of Emulsion is poor and the percentage of decomposition of water and oil up to 24 hrs. is not being recorded.

Mr. Mazzali and Mr. Aminul Haque asked the Quality Control Officer to maintain the said record properly. The Quality Control Officer of Platinum said that he was taught, by Dr. Attar in the UNDP / UNIDO Quality Control Training, that emulsion stability means the period of time taken till the start of breaking (Decomposition) from the time of preparation. Dr. Attar also said that the starting of decomposition is the Breaking point of emulsion. The quality control Officer said that at present, he was not following the above advice, instead he was considering the period of stability of emulsion i.e. time taken to float oil of the emulsion in a graduated cylinder.

Mr. Aminul Haque and Mr. Mazzali asked the Quality Control Officer whether he was using the instruments (P.H. Meter, Viscoso meter, Hydrometer, etc.) supplied by UNDP / UNIDO in the month of May, 1979.

It was decided in the meeting on 22.9.1979, that Mr. N. Zaman or Mr. Q. Hassan, Counterpart (Q.C.) UNIDO might be requested to come to Platinum to demonstrate the above instruments. Mr. Aminul Haque and General Manager of Platinum asked Quality Control Officer to arrange the same immediately.

Mr. Aminul Haque then wanted to know about the Quality of J.B. Oil, Emulsifier and Water.

Regarding J.B. Oil, General Manager, Platinum Jubilee Jute Mills informed that a few days back he had a meeting with the suppliers and the suppliers promised to supply better quality.

As the foreign emulsifier (Nonidet P.40, Hostapol, Nikanil - 910 Lissapol etc.) cannot be imported by the Jute Mill authorities under their own normal licences Mr. Aminul Haque asked quality Control Officer to arrange specifications for the above emulsifiers, which may be supplied to the Local Manufacturers to produce emulsifier like the foreign quality. He also requested Mr. Mazzali and Mr. Galletti to supply him a leaflet for water softening plant, so that judging the suitability he may submit it to the BJMC Higher authority for all the mills. Regarding Rapisonic Plant Mr. Aminul Haque asked Mr. Mazahar, Engineer to collect the proposals from UNDP / UNIDO Productivity Team and to consult with Mr. Salek, Dy. Chief Engineering (Counterpart) who would be visiting Platinum Jubilee next Tuesday, the 20th November 1979.

Finally, Mr. Aminul Haque again requested the Platinum personnel to go through the final reports very carefully and also to implement the UNDP/ UNIDO Productivity Teams proposals immediately for the greater interest of the mills.

The meeting ended with a vote of thanks to the Chair.

A.M. Aminul Haque
General Manager (PP)
BJMC, Adamjee Court,
Motijheel C/A, Dacca.

ANNEX XVI

BANGLADESH JUTE MILLS CORPORATION

UNIDO / UNDP

PLATINUM JUBILEE JUTE MILLS

KHULNA

Date 18.2.1980

The Team Leader,
Productivity Team,
UNIDO-UNDP
D A C C A.

Dear Sir,

We furnish herewith an observation report as follows:-

Morrah: Although the size of the Morrah has improved more attention should be given to improve further and to maintain accordingly.

Emulsion: Most of the proposals for the emulsion have been implemented and those remaining are in the process of implementation. Nonidet P-40 is being used as an emulsifier. The stability period of emulsion may increase if the Officer keeps his eye on the situation.
Some spare parts have already been changed in No. 1 Emulsion Plant but better emulsion is not being achieved on a regular basis.

Feeding of Softener: One, out of five softeners, is being used for cutting and the others are in double feeder arrangements and are being implemented as per our proposals.

Spreaders: Four spreaders are in running condition. As per approved set up only three workers are available to run the spreaders and therefore only three machines can be run at a time. Most of the proposals have been followed.

Breaker and Finisher Card: Our team proposed to make batch composition in the finisher card instead of in the breaker card in the hessian warp unit, management intends to do this at a suitable time. Soft jute in hessian warp, hessian weft and sacking warp will be used, after it has been treated by softening or spreading, instead of uncut piled jute; allowing considerable time for conditioning.

Piling: the jute pile making procedure has been implemented but records of temperature tests are not being done as proposed, the authority however intend to do same accordingly.

Yours faithfully,

(M. KAMALUDDIN AHMED)
Counterpart UNIDO

c.c. The General Manager
P.J.J.M. Ltd.
Khulna.

ANNEX XVII

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MINUTES OF THE MEETING
UNDP/UNIDO Prod. Team

Minutes of the meeting held in the Chamber of the General Manager of CJMCL on 12/12/79 at 10-00 A.M.

Present:

1. Mr. A. Hakim Miah, General Manager, CJMCL
2. Mr. R. Mazzali, Team Leader UNIDO. Prod. Team
3. Mr. Giash Uddin Ahmed, Manager Production, CJMCL
4. Mr. F. Islam, Sr. Q. Control Officer, CJMCL
5. Mr. K.A. Talukder, Sr. Asstt./Counterpart UNIDO Prod.Team
6. Mr. Abdul Jalil, Sr.Sup/Counterpart UNIDO Prod. Team.

Mr. A.M. Aminul Haque, General Manager (PP) was in the Chair. The agenda of the Meeting was to discuss the report submitted by the UNIDO prod. Team. At the very start of the meeting Mr. Aminul Haque, General Manager (PP) BJMC, explained to the members present the utility of the Works of the UNIDO Personnel and to implement the proposals as far as possible to increase the efficiency of the organization. From the report it appears that the mill authority is adopting the suggestions gradually and getting better results.

1) At one point Mr. Haque suggested that there should be one standard of Morrah weight instead of the 3 standards at present in the mill. After discussion, it was resolved that one standard is suitable for processing and hence it should be implemented.

2) The next point on Emulsion was discussed and, after discussion and study of the latest report, it was resolved that the emulsion has been improved considerably in respect of stability, colour and other factors. Yet there is more scope to improve the emulsion with the use of condensed water and suitable J.B.Oil.

   a) Regarding use of condensed water, the mill has already taken action, but due to nonavailability of cement, the construction of storage tank for condensed water is stopped now. However the mill will solve the problem within the shortest possible time.

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b) Regarding J.B. Oil, as the mill has no other alternative but to accept the J.B.O. from Eastern Refinery through Burma Eastern, the BJMC has already discussed the matter of J.B.O.with the proper authority of Oil Corporation.

3) The next point, the metering unit which is already working in C.B.C. mills and in mill no. 2 are giving comparatively better results. Hence, the mill authority has already taken action to commission the metering unit in mill No. 1 which is in progress.

4) The discussion over double feeder for Softener Machine it was resolved that, the suggestions of double feeder is already in the action.

5) After threadbare discussion in regards to utilisation of Line cuttings and Dry cuttings, it has been resolved that these two type of cuttings should be processed separately in softener machine.

At the end Mr. Haque requested Mr. Mazzali to submit a vivid report about the mechanical condition of machinery in line with the report of platinum jubilee jute mills ltd.

Mr. Mazzali emphasised that the team is getting full co-operation from the mill authority.

As there was no other point to discuss, the meeting was ended with the Vote of thanks to the Chair.

(A.M. Aminul Haque)
Chairman
12-12-79

DISTRIBUTION:

1. Mr. A. Hakim Miah, General Manager, CJMCL
2. Mr. R. Mazzali, Team Leader UNIDO Productivity Team
3. Mr. Giash Uddin Ahmed, Manager Production CJMC
4. Mr. F. Islam,Sr.Q.Control Officer, CJMCL
5. Mr. K.A.Talukder,Sr.Asstt/Counterpart UNIDO Productivity Team
6. Mr. Abdul Jalil,Sr.Sup/Counterpart U N I D O Productivity Team

cc to(1)Director (PP),BJMC,Adamjee Court, Motijheel C/A, DACCA

ANNEX XVIII

CHITTAGONG JUTE MANUFACTURING COMPANY LTD.

P.O. MOHARA, KALURGHAT, CHITTAGONG

Dated 18.2.1980

REPORT ON PROPOSALS OF UNIDO PRODUCTIVITY TEAM

1. About productivity team proposal No. 1 A.

a) For uncut jute : Our quality control department is taking the test of daily checking and advising the concerning department to correct the faults coming out from the test.

b) For cut jute and low quality uncut jute : Our quality control Department is taking the test of morrah weight of single workers and trained them to reduce to a minimum of their faults.

c) For one standard of morrah weight: The management has decided to keep two standards of morrah weight i.e. for cut jute 2 Lbs-2.5 Lbs. and for uncut jute 2 Lbs. - 3 Lbs. in order to make uniform weight at feed cloth of the breaker card.

2. About productivity team proposal No. 2 - A

a) J.B.O. : Our quality control department is taking the maximum possible test, of each and every delivery of J.B.O. from Burma Eastern Ltd. But the results are not yet sent to BJMC experts.

b) Water: The management has no plan for installation of water softening plant. But we have completed all pipe lines and other arrangements except construction of reserve tank for using steam condensed water in making emulsion. This construction is delayed due to non availability of cement. We hope that this will be completed when cement is available.

c) Emulsifier : The problem of emulsifier is solved because we are presently using Nonident P-40. But the percentage of utilisation is 0.125% in emulsion against the UNDP suggestion of 0.5%.

d) Plants: As the old conventional plant is replaced by new plant like the Dacce Jute Mills type which is giving better results, the management decided to run all softeners in Mill No. 1 by this new plant.
The softeners of Mill No. 2 and CBL will be run by rapisonic plant.

3. Regarding Proposal No. 3 - A.

a) Maintenance of metering Unit : The softener machines of Mill No. 2 and CBD are running with metering unit without any disturbance but out of four machine, only one machine has a solenoid valve, without which emulsion wastage is too much. Out of 7 softner machine of Mill No. 1,5 machine are running with metering units and maintenance is done regularly, but the emulsion flow rate is very irregular as the waste emulsion contains dust and impurities which create jams in the delivery pipe and there should be a pump for required pressure at delivery side.
In order to remove the dust from waste emulsion we applied a straining system which is not fully completed, but we hope it to be completed very shortly.
In respect of supply pump the management has decided to set up a pump very shortly.

b) Feeding of softener : There are 2 feeders and 2 receivers working in all softeners for all the time and they were trained to feed uniformly throughout the full width of the feed conveyor.

c) Speed of softener : The speed of feed and delivery cloth roller was regularised as per machine manufacturers instructions.

d) The proposal for converting three shifts to 2 shifts by increasing Nos. of softeners is not yet done. Management has been thinking to implement the proposal if the working condition can be motivated.

e) Installation of spreader machine: The management hopes to point out the matter to BJMC authority duly submitting the pros and cons of both types of machines suggested by UNDP/ UNIDO Prod. Team.

4. Regarding proposal No. 4 - A

Hand-spray of emulsion : The hand-spray system of emulsion on the hard roots during piling is still going on, as the root cutting is done after piling.
The hand-spray will however be stopped if cutting of root system before softener is implemented in this mill. The management is thinking about it.

5. Regarding proposal No. 5 - A

a) Cutting of roots: Cutting the roots after piling has been customary from the earliest days in this mill and still it is continuing. Due to the problem of root cutters and shortage of space the management can not implement the proposed system of cutting the jute roots before processing in the softener just now, although they agree on the point.

b) Piling of dry cuttings and line cuttings: thisis in order as per the proposal.

The management is of the opinion that by adopting suggestions, instructions & guidance of UNDP/UNIDO Productivity team the efficiency of the mill has been improved.

K.A. Talukder Abdul Jalil	Giash Uddin Ahmed	A. Hakim Miah
Counterparts UNDP/UNIDO Prod.Team.	Manager Production Chittagong Jute Mfg.Co.Ltd.	General Manager Chittagong Jute Mfg. Co. Limited

ANNEX XIX

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PRACTICAL TRAINING

SUMMARY OF MORRAH TESTS

MILL	N°. OF WORKERS CHECKED	BEFORE TRAINING				AFTER TRAINING				PRESENT POSITION (Approx. 3 months after training)			
		Light	Std.	Heavy	No. of tests	Light	Std.	Heavy	No. of tests	Light	Std.	Heavy	No. of tests
1. DACCA J.M.	42	161	218	201	580	48	502	50	600	135	252	86	473
2. BANGLADESH J.M.	22	67	98	69	234	51	211	68	330	28	12	-	40
3. PLATINUM J.M.	30	121	315	132	568	153	382	51	586	282	503	10	795
4. CHITTAGONG J.M.	24	127	494	129	750	8	724	18	750	10	727	13	750
TOTAL	118	476	1125	531	2132	260	1819	187	2266	455	1494	109	2058
% OF TOTAL			52,77				80,27				72,59		

ANNEX XX

TRAINING COURSE

SUMMARY

DATE			ZONE	PARTICI-PANTS	HOURS		
STARTED	ENDED	LENGTH (DAYS)			THEORY	PRACTICE	TOTAL
23/7/79	26/7/79	4	DACCA I & DACCA II	9	13.5	13.5	27
6/ 9/79	9/ 9/79	4	KHULNA	8	13.5	13.5	27
24/9/79	27/9/79	4	CHITTAGONG	10	13.5	13.5	27
TOTAL		12		27	40.5	40.5	81

ANNEX XXI

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Consulenze e progettazioni industriali
via Amedei 15 - 20123 Milano

Capitale sociale L. 560.000.000
Sede legale: corso Italia 8 - Milano

From: R. Mazzali
Productivity Team Leader

Dr. Ihab A.H. Ascar
UNIDO Project Manager

Dear Sir,

20th October 1979

Subject : Productivity Training Programme - Project DP/BGD/73/043

I have the pleasure to inform you that the training mentioned above has been carried out according to the Time Table enclosed herewith in Annex 1 pages I, II and III, together with the list of participants who attended the training course from the 16 pre-selected mills in the four zones (Annex 2).

The training was imparted by Mr. Galletti and myself with the assistance of part-time local lecturers from the Jute Industry. The Annex 3 shows the name of the local lecturers and their present place of posting, together with the hours of lecture and rate/hour and days for daily allowance and finally the total amount to be paid to each of the lecturers. The amount has been calculated on the basis of the rate/lecture hour and daily allowance as approved by you in case of the Quality Control Training Programme already carried out and the lecturers paid accordingly.

This is for your kind approval and passing instructions for necessary payment arrangement.

Yours faithfully,

Reg. Impr. Milano 120521
c.c.i.a. 637523

telefono: 8579
telegrammi: Borghibaldo Milano
telex: 320033 BBMIL I

PRODUCTIVITY TEAM TRAINING PROGRAMME

DACCA ZONES I & II

Dates	Name of Lecturer	Subject	Duration of Classes Theor. hrs.	Duration of Classes Practical hrs.
23/7/1979	Mr. L. Galletti	Introduction with P/Heads	-	-
24/7/1979	Mr. Kamaluddin Ahmed	Jute Fibre	1½	1½
	-do-	Jute Morrah & Moisture	1½	1½
	Mr. S. U. Dewan	Emulsion Composition I	1½	1½
25/7/1979	Mr. Abdur Rahman	Softenor & Spreader	1½	1½
	-do-	Emulsion Application	1½	1½
	Mr. M.A.Jalil	Piling I	1½	1½
26/7/1979	Mr. M.A. Jalil	Piling II	1½	1½
	Mr. S.U. Dewan	Emulsion Composition II	1½	1½
	Mr. L. Galletti	Ways of processing soft and hard jute.	1½	1½

ANNEX 1

Page II

PRODUCTIVITY TEAM TRAINING PROGRAMME

KHULNA ZONE

Dates	Name of Lecturer	Subject	Duration of Classes Theor. hrs.	Practical hrs.
6 / 9/ 1979	Mr. Kamaluddin Ahmed	Jute Fibre	1½	1½
	-do-	Jute Morrah & Moisture	1½	1½
	Mr. S. U. Dewan	Emulsion Composition I	1½	1½
7 / 9/ 1979	Mr. Abdur Rahman	Softener and Spreader	1½	1½
	-do-	Emulsion Application	1½	1½
	Mr. Kamaluddin Ahmed	Piling I	1½	1½
8 / 9/ 1979	Mr. Abdur Rahman	Piling II	1½	1½
	Mr. S. U. Dewan	Emulsion Composition II	1½	1½
	Mr. L.Galletti	Ways of processing soft and hard jute	1½	1½
9/ 9/ 1979	Mr. L. Galletti	Meeting with the Project Heads and Zonal General Manager		

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XXI/2

ANNEX 1

Page III

PRODUCTIVITY TEAM TRAINING PROGRAMME

CHITTAGONG ZONE

Dates	Name of Lecturer	Subjects	Duration of Classes Theor. hrs.	Duration of Classes Practical hrs.
24/9/1979	Mr. Kamaluddin Ahmed	Jute Fibre	1½	1½
	-do-	Jute Morrah & Moisture	1½	1½
	Mr. S. U. Dewan	Emulsion Composition I	1½	1½
25/9/1979	Mr. Abdur Rahman	Softener & Spreader	1½	1½
	-do-	Emulsion Application	1½	1½
	Mr. M.A. Jalil	Piling I	1½	1½
26/9/1979	Mr. M.A. Jalil	Piling II	1½	1½
	Mr. S. U. Dewan	Emulsion Composition II	1½	1½
	Mr. L. Galletti	Ways of processing soft and hard jute.	1½	1½
27/9/1979	Mr. L. Galletti	Meeting with Project Heads and Zonal General Manager.		

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Annex 2

List of the Production Officers in the 16-preselected mills who attended the training on Productivity Measures in the Jute Mills in the 4 zones.

Name of the participants	Name of the Mill.
Dacca Zone I & II	
1. Mr. Muklesur Rahman Sr. Asstt.	U.M.C. Jute Mills.
2. Mr. A.Y.M.Shamsul Alam Sr. Supervisor	-do-
3. Mr. Remizuddin Ahmed Sr. Asstt.	Nishat Jute Mills
4. Mr. Abul Quashem Sr. Supervisor	-do-
5. Mr. Jamaluddin Ahmed Sr. Supervisor	Bangladesh Jute Mills
6. Md. Monoarul Hossain Sr. Asstt.	-do- Latif Bawany Jute Mills
7. Md. Shafiq Ullah Sr. Asstt.	Bangladesh Jute Mills
8. Md. Saifuddin Ahmed Sr. Asstt.	Dacca Jute Mills Ltd.
9. Md. Ataur Rahman Sr. Asstt.	Dacca Jute Mills Ltd.
Khulna Zone	
1. Mr. Ahmed Ali Sr. Asstt.	Platinum Jute Mills
2. Mr. Sah Mohd. Yasin Sr. Supervisor	-do-
3. Mr. B.M.Z. Hoque Sr. Mill Asstt.	Crescent Jute Mills Ltd.
4. Mr. Md. Enamul Hoque Sr. Supervisor	-do-
5. Mr, Abdur Rauf, Sr. Asstt.	Star Jute Mills Ltd.
6. Mr. B.A. Gaffar Supervisor	Star Jute Mills Ltd.
7. Mr. Mafizul Islam, Sr. Asstt.	Peoples' Jute Mills Ltd.
8. Mr. Quadirul Islam, Sr. Supervisor	Peoples' Jute Mills Ltd.

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Chittagong Zone

Name of the participants	Name of the Mill
1. Md. Shamsul Alam Quality Control Officer	Karnafuli Jute Mills
2. Md. Harun-or-Rashid Shift-In-Charge	Karnafuli Jute Mills
3. Mohd. Sahjahan Sr. Supervisor	Amin Jute Mills
4. Md. Mosharraf Hossain Bhuiyan Sr. Supervisor	Amin Jute Mills
5. Mohammad Ali Shift-in-Charge	S.K.M. Jute Mills
6. Mr. M.A.Matin Sr. Asstt.	S.K.M. Jute Mills
7. Mr. A. Haque Sr. Supervisor	C.J.M.C.L.
8. Mr. B. U. Khan Sr. Supervisor	C.J.M. C.L.
9. Mr. Shafiqur Rahman Sr. Assistant	C.J.M.C.L.
10. Mr. Sekandar Ali Sr. Supervisor	C.J.M.C.L.

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Annex 3

STATEMENT OF AMOUNTS TO BE PAID TO THE LOCAL LECTURERS

Sl.No.	Name of Lecturer & Post	Hours	Rate Tk.	No. of days in Ctg/Khl/Dacca	Daily allowance Tk.	Total Tk.
1.	Mr. S. U. Dewan Counterpart & Manager BJMC, Dacca	18	100	6	50	2,100.00
2.	Mr.Kamaluddin Ahmed Counterpart & Sr. Assistant Platinum Jute Mills, Khulna.	21	100	2	50	2,200.00
3.	Mr. Abdur Rahman Counterpart & Sr. Asstt. National Jute Mills Dacca	21	100	3	50	2,250.00
4.	Mr. M.A. Jalil	12	100	2	50	1,300.00
	Total	72	100	13	50	7,850.00

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ANNEX XXII

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MAN / MONTHS

Name	Movements		Days present
	arrival	departure	
1 - MORFINI	17-1-1978	10-2-1978	24
	28-3-1978	11-4-1978	14
	17-10-1978	24-10-1978	7
	9-1-1979	16- 1-1979	7
	28-1-1979	2- 2-1979	5
	14-9-1979	18-9-1979	4
			61
2 - TOMEI	17-1-1978	3- 7-1978	167
	28-8-1978	19-11-1978	83
			250
3 - BOATI	17-1-1978	22-3-1978	64
	30-3-1978	11-4-1978	12
			76
4 - SCHMIEDKUNZ	3-2-1978	1-9-1978	210
	20-10-1978	12-12-1978	53
			263
5 - BALDO	22-4-1978	2-5-1978	10
			10

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MAN/MONTHS

Name	Movements		Days present
	arrival	departure	
6 - MAZZALI	17-1-1978	21-7-1978	185
	9-9-1978	22-12-1978	104
	10-2-1979	18-7-1979	158
	24-8-1979	14-12-1979	112
	15-1-1980	24-2-1980	40
			599
7 - GALLETTI	11-11-1978	16-2-1979	97
	6- 3-1979	10-6-1979	96
	26-6- 1979	4-10-1979	100
	11-10-1979	30-11-1979	50
	1- 2-1980	21-2-1980	20
			363

TOTAL DAYS' PRESENCE: 1622

EQUAL TO MAN-MONTHS: 54,06

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ANNEX XXIII

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DAYS OF PERMANENCE FROM 1/6/1979- 24/2/1980

Name of experts	June '79	July '79	August '79	Sept. '79	Oct. '79	Nov. '79	Dec. '79	Jan. '80	Feb. '80	TOTAL
MORFINI	-	-	-	4	-	-	-	-	-	4
GALLETTI	14	31	31	30	24	30	-	-	20	180
MAZZALI	30	18	7	30	31	30	14	16	24	200
	44	49	38	64	55	60	14	16	44	384
Calendar days	30	31	31	30	31	30	31	31	29	
Theoretic presence of 3 people	90	93	93	90	93	90	93	93	87	822

Percentage = $\frac{384}{822}$ = 46.72 %

ANNEX XXIII

ANNEX XXIV

ANNEX XXIV

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s.p.a.

11.12.1979

Dear Mr. Haque,

As you know I will leave Dacca on home leave on 14/12/1979 and will be back in mid-January, 1980, Mr. Dewan and Mr. Saleh, Counterparts attached to the Productivity Team will be jointly responsible for the Team's work as per the enclosed work programme, during my absence.

Thanking you,

Yours sincerely

R. Mazzali
Team Leader
UNDP/UNIDO Productivity
Team

Mr. A.M. A. Haque
General Manager (PP)
BJMC DACCA

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s.p.a.

PROGRAMME FROM 15.12.1979 TO 15.1.1979

DACCA JUTE MILLS - 1. Complete technical and economical evaluation of SPREADER m/c CBC Deptt. This evaluation should cover :

a) Mechanical side;
b) production side
with estimation of :

- expenses Time required if all spare
- saving parts are available.

Please remember the necessary training of the people involved.
Remember also emulsion plant.

2. Processing - please check all the results coming from the new processing, supposed to be started in hessian warp within a few days.
A complete comparison of results between the previous one and the new one should be made.

Comparison of costs between the old and new processing.

3. Check of the mechanical condition of spinning frame so that a complete mechanical report can be prepared.

BANGLADESH JUTE MILLS 1. Check on the advice given to them through previous reports and their implementation.

2. Complete check on the actual way of processing of raw jute from batching to Finisher Card for all the qualities running.

3. Write down the concerned proposals about processing if found otherwise.

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s.p.a.

4. Checking of the necessary elements of the mechanical Report.
5. Proposals as regards some modifications/changes in emulsion distribution. Required changes of draft of FLTM drawing frames in light unit.

PLATINUM JUTE MILLS

1. Maximum help to the Mill authorities for the implementation of the proposals already made through various reports.
2. Short report as regards implementation and achievements made within mid January, 1980.
3. Checking of the mechanical elements for the preparation of the future reports.

CHITTAGONG JUTE MILLS: SAME AS KHULNA (PLATINUM) on the production side only since mechanical side has already been taken care of.

ANNEX XXV

BANGLADESH JUTE MILLS CORPORATION
ADAMJEE COURT : MOTIJHEREE:DACCA

Ref. NO. BJMC/DSP-Office Order 1/645 Dated 4.6.79

OFFICE ORDER

The transfers of the following Officers are hereby made to the places of posting as mentioned against their respective name, in their existing grade, pay and pay scale with immediate effect :

Sl. No.	Name & Designation	From	To
1.	Mr. Jainal Abedin, Mech. Engineer	Janata Jute Mills Ltd.	National Jute Mills Ltd.
2.	Mr. Shamsul Alam, Asstt.Mech.Engineer	Delta Jute Mills Ltd.	Janata Jute Mills Ltd.
3.	Mr. Anwar Hossain Maintenance Engineer	Gawsia Jute Mills Ltd.	Productivity Consultants Team (UNDP)
4.	Mr. A. Kalam Assistant Engineer	Platinum Jubilee Jute Mills Ltd.	- do -

Sl. Nos. 1 & 2 will report for duty to the respective Head of the mill of their posting, while Sl. Nos. 3 & 4 to Team Leader, UNDP Productivity Consultants Team immediately.

It may be noted that Sl. No. 3 & 4 will, however, continue to draw their salary etc. from their present place of posting until further order. If required by the respective Head of the Mills, Sl. No. 3 & 4 will vacate the mill quarters and hire a house in Dacca within their rental allowance/ceiling for accommodation as admissible under rules and this will also be borne by the above mills.

They will get similar facilities as allowed to other counterparts.

The above transfers have been made in the interest of the Corporation.

(K.M. Afsar)
Sr. Dy. Secretary (P&C)
& Oftg. Secretary

Distribution:

1. Persons concerned.
2. General Managers (DZ-I)/(DZ-II)/(CZ)/(KZ), BJMC.
3. Chief Accountant/Audit Adviser/Chief Public Relations Officer/General Manager (Ins.)/General Manager (PP), BJMC
4. Chief Engineer, BJMC, Dacca
5. Dr. Ihab A.H. Ascar, UNIDO Project Manager, Adamjee Court, Dacca
6. Team Leader UNIDO Productivity Consultants Team, Adamjee Court, Dacca
7. General Manager, Platinum Jubilee Jute Mills Ltd., Khulna
8. General Manager, National Jute Mills Ltd.
9. Manager, Delta Jute Mills Ltd. Chaumuhani, Noakhali
10. Manager, Gawsia Jute Mills Ltd. Janata Jute Mills Ltd.
11. Heads of the Accounts Section of the concerned Mills.
12. C.O. to Director (PP)/Director (Tech.), BJMC, Dacca
13. Files concerned.

ANNEX XXVI

ANNEX XXVI

Team Leader
UNDP Productivity Consultants Team,
Adamjee Court,
DACCA

7th July 1979

Subject : Joining Report

Dear Sirs,

In compliance with the B.J.M.C. Head Office Order No. BJMC/DSP Office Order 1/645, dated 4/6/79, I have the honour to report myself for duty today forenoon the 7th July 1979 as Assistant Engineer (Mech.), which may kindly be accepted and there by oblige.

Thanking you,

Yours faithfully,

SK. ABUL KALAM
Asstt. Engineer (Mech)

ANNEX XXVII

ANNEX XXVII

The Team Leader
UNDP Productivity Consultants Team,
Adamjee Court,
Motijheel C/A.,
DACCA

11th September 1979

Subject : Joining report

Dear Sirs,

In pursuance of the Office Order No. BJMC/DSP-Office Order-1/833 dated 25/7/79, I have joined in my duties today, the 11th September 1979 (forenoon) which may kindly be accepted.

Thanking you,

Yours faithfully,

MD. NURUN NABI
Asstt. Mechanical Engineer
Gawsia Jute Mills Ltd.

ANNEX XXVIII

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s.p.a.

Capitale sociale L. 560.000.000
Sede legale: corso Italia 8 - Milano

Consulenze e progettazioni industriali
via Amedei 15 - 20123 Milano

Mr. S.Y. BAKHAT
Director (PP)
BJMC, Dacca

30th June 1979

Dear Sir,

During the last months, particular problems concerning our Team counterparts have been getting worse.
These problems are concerning mainly :

A) Availability of counterparts

B) Counterparts allowances and designations

C) Accomodation problems of counterparts.

Since these problems are hampering in a notable way the Team activity, we have them pointed out, more than once, verbally and in writing, to our Project Manager.

We will be very grateful if you could grant us a meeting on these subjects, present our Project Manager, to find out, by mutual consent, a satisfactory result.

Yours faithfully,

R. MAZZALI
Team Leader
UNDP/UNIDO
Productivity Team, BJMC
Dacca.

Reg. Impr. Milano 120521
c.c.i.a. 637523

telefono: 8579
telegrammi: Borghibaldo Milano
telex: 320033 BBMIL I

ANNEX XXIX

Mr. R. Mazzali
Team Leader
UNDP/UNIDO Productivity Team
BJMC, Dacca

3rd July 1979

Re : BGD/73/043 dated 30.6.1979

Dear Sirs,

As desired in your letter under reference, a meeting has been arranged, which will be held in the Chamber of the undersigned on Friday, the 6th July 1979 at 9 A.M. to discuss the problems concerning the counterparts in UNDP/UNIDO Productivity Team. mainly :

A) Availability of counterparts,

B) Counterparts allowances and designations,

C) Accomodation problems of counterparts.

You are therefore, requested to make it convenient to attend the aforesaid meeting.

Yours faithfully,

S.Y. Bakht
Director (PP)

Distribution :

1. Mr. A.M. Aminul Haque
   General Manager (PP), BJMC, Dacca
2. Mr. K.M. Afsar
   Officiating Secretary, BJMC, Dacca

   cc. to :

   Mr. Ihab A.H. Ascar
   UNIDO Project Manager
   BJMC, Dacca

ANNEX XXX

borghi e baldo ingg.
s.p.a.

7th December 1979

From: Mr. R. Mazzali
Productivity Team Leader

To: Mr. B. Kocer
UNDP

Ref.: VIENNA (UNIDO) 26/11 1744

M E M O

It is our opinion that:

- the success of the assistance of UNIDO and World Bank to the Jute Industry in Bangladesh depends essentially on the following facts:-

i) elaboration of organic and systematic programmes with realistic objectives being clearly defined;

2) exact subdivision of the duties while, at the same time, obtaining maximum co-ordination between the two authorities in order to exclude voids and overlaps.

- Before we come to the details we think it is essential to define the significance of certain terms:

d) CONDITIO ING - A sequence of extraordinary operations in order to restore the machines and plant to the initial and most efficient condition.

b) MAINTENANCE - A sequence of ordinary operations often with pre-set cycles in order to maintain machines and plant in a state of maximum efficiency.

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s.p.a.

A) CONDITIONING PROGRAMME

An organic programme obviously has to be common to all activities of the corporation i.e.

- machinery, plant and services of all mills and of all processing phases and cycles.
- therefore the following has to be clearly defined:

d) the criteria on which the programme has to be based;

b) the priorities and possibilities of action

c) the duration and means of execution.

It can be seen that, before taking such a decision, certain information has to be collected and evaluated.

A-1 - Evaluation of the present conditions

- General inventory of:
  working, installed or available machinery
- plant
- spare parts and accessories
- valutation of the age, the present mechanical condition and the expected life of the foregoing.

A-2 Evaluation of possibilities of support

- Evaluation of the supporting workshop, their potential and capacity to produce spares to pre-set standards;
- Evaluation of foreign suppliers;
- Evaluation of available staff, their degree of knowledge;
- Existing technical equipment (drawing boards and instruments, calculating instruments etc.).

A-3 Evaluation of requirements

- Production programme to be established for the forthcoming years;
- Requirement of machinery, plant, accessories and services in order to obtain the aforesaid production;
- Evaluation of the need of conditioning of machinery, plant services and accessories, the utilization of which is foreseen in the production programme;
- Evaluation of the cost and necessary time.

A-4 Elaboration of the programme

- Comparison between requirement and availability of:-
    - cost
    - existing support
    - staff
    - time.
- Determination of priorities based on solid technical-economic criteria resulting from previous data.
- Elaboration of the programme of
    - work to be executed
    - cost
    - time
    - staff employed
    - necessary support.

The programme has to be approved by the Corporation being binding upon the Corporation.

B) MAINTENANCE

It is known that maintenance can be separated into two spheres:-

a) Planned maintenance eg. routine lubrication, cleaning, periodical replacement of pins etc.,

b) Preventive Maintenance eg. repair or replacement of worn parts.

In order that both types of maintenance are working satisfactorily it is necessary to:-

B-1 Prepare the technical specification, inclusive of the most important details on the construction and maintenance of machinery and plant.

B-2 Prepare instruction books in written form answering among other things:-

- what is to be done and why
- how and when to do it;
- who should do it and what is required to be done.

The instruction books have to be set up for identical groups of machinery and have to be approved and followed by all the mills of the Corporation.

B-3 Prepare a case history, in written form, illustrating the proper way to repair the most frequently occurring break-downs.

B-4 Establishing technical services within every mill as well as at the senior level of the corporation.

- These services shall be responsible for:
  - the conservation of machinery, plant, services and buildings being national property;
  - the studies of modifications or new plant and installations;
  - the technical control and acceptance of supplied spare parts and technical materials.
- This Technical Service has to be supplied with proper documentation.

B-5 Planning the training of the staff who, at every level, shall work for the same purpose

B-6 Planning, at senior level, the supply of standard spare parts, technical material etc. selecting the most adequate suppliers.

B-7 Preparing an annual maintenance budget for every department, every mill and the Corporation as a whole.

C) ACTION TO BE TAKEN IMMEDIATELY

Both of the programmes

- do concern basic problems, that is why
- they will give continuous results on a wide scale

  but

- only after a long time

  because

- they require a long preparatory period.

- During the preparatory period it is possible to establish a short-time programme which can be used as experience and training for the staff.

- The productivity team could, if required and if assisted, provide within a short time an evaluation of the very first basic necessities of certain pre-selected mills.

  This evaluation may suggest

  . same very urgent operation of conditioning and maintenance;

  . necessary means, time and cost.

After approval this evaluation could be transformed into an operative programme.

D) ORGANIZATION

The programme, as a whole, will be successful due to:-

- the utmost co-ordination between the various activities;
- the utmost control of the progress;
- exchange of information between the various activities.

That is why the following form of organization is considered to be the best:

D-1 The general co-ordinator - with responsibility of control and co-ordination. He is responsible for all the programme and especially for the exchange of information between the two activities.

D-2 One responsible for the conditioning programme which could be the task of the World Bank.

D-3 One responsible for the maintenance programme and for short-time programme.

GENERAL CO-ORDINATOR

ACTIVITY

- WORLD BANK - Equipment & Machinery
- CONDITIONING PROGRAMME - (World Bank or UNDP/UNIDO or any ex-partiate)

Activity
UNDP/UNIDO

MAINTENANCE PROGRAMME

SHORT-TIME PROGRAMME