FEASIBILITY STUDY
FOR
THE PLANT RENOVATION
PADALARANG PULP AND PAPER MILL
IN
THE REPUBLIC OF INDONESIA

OCTOBER, 1984

JAPAN INTERNATIONAL COOPERATION AGENCY

PREFACE

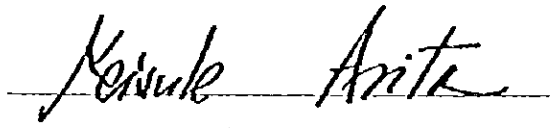
In response to the request of the Government of the Republic of Indonesia, the Government of Japan decided to conduct a feasibility study on the Project for Renovation of the Padalarang Pulp and Paper Mill and the Basuki Rachmat Pulp and Paper Mill and entrusted the study to the Japan International Cooperation Agency (JICA). The JICA sent to Indonesia a survey team headed by Mr. TADAO KANO from February 26 to March 27, 1984.

The team conducted a field survey in the Padalarang and Banjuwangi areas with the cooperation of the officials concerned of the Government and above-mentioned two mills. After the team returned to Japan, further studies were made and the present report has been prepared.

I hope that this report will serve for the development of the Project and contribute to the promotion of friendly relations between our two countries.

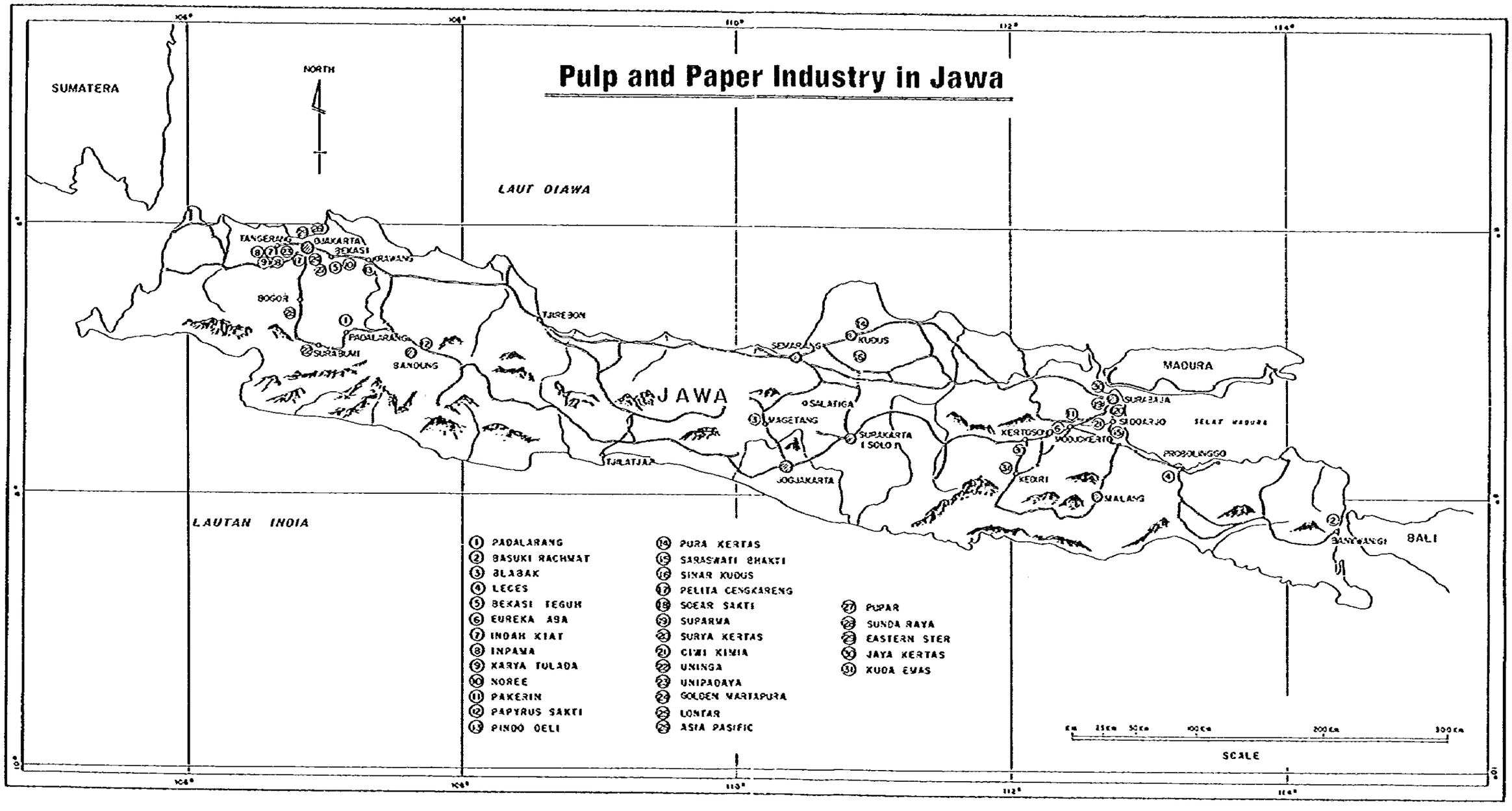
I wish to express my deep appreciation to the officials concerned of the Government of the Republic of Indonesia and the two Mills for their close cooperation extended to the Team.

Tokyo, October 1984



Keisuke Arita
President
Japan International Cooperation Agency

Pulp and Paper Industry in Jawa



In this report the following currency exchange rates are used:

Values up to Oct. 1978	US$1 = Rp425
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Values from Mar. 1983 to Feb. 1984	US$1 = Rp1,000

When calculating new investment and others for financial analysis

US$1 = ¥230
US$1 = Rp1,000

ABBREVIATIONS

DGBCI	The Directorate General of Basic Chemical Industries, Ministry of Industry
IPPA	Indonesian Pulp and Paper Association
BRPP	Basuki Rachmat Pulp and Paper Mill
PPM	Padalarang Pulp and Paper Mill
JICA	Japan International Cooperation Agency
JETRO	Japan External Trade Organization

ABBREVIATIONS

A.D.	Air Dry
B.D.	Bone Dry
BKP	Bleached Kraft Pulp
BL	Black Liquor
B.O.D.	Biochemical Oxygen Demand
C.D.	Cross Direction (Paper Machine)
C.I.F.	Cost, Insurance and Freight
C.O.D.	Chemical Oxygen Demand
C.S.	(Mimeotype) Stencil Paper
S.C.F.	Canadian Standard Freeness
C.T.M.P.	Chemithermo Mechanical Pulp
D.C.F.	Discounted Cash Flow
E.I.R.R.	Economical Internal Rate of Return
F.O.B.	Free on Board
GL	Green Liquor
HVO	Printing Paper
HVS	Writing Paper
I.R.R.	Internal Rate of Return
I.R.R.O.E.	Internal Rate of Return on Equity
I.R.R.O.I.	Internal Rate of Return on Investment
J.I.S.	Japanese Industrial Standards

ABBREVIATIONS

$CaCO_3$	Calcium Carbonate
Ca-Hypo	Calcium Hypochlorite
CaO	Caustic Line
CCP	Cast Polypropilen
H_2SO_4	Sulphuric Acid
NaCℓ	Sodium Chloride
Na_2CO_3	Sodium Carbonate
NaOH	Caustic Soda
Na_2S	Sodium Sulphide
Na_2SO_4	Salt Cake (Sodium Sulfate)

ABBREVIATIONS

KP	Kraft Pulp
L. BKP	Hard Wood Bleached Kraft Pulp
L. UKP	Hard Wood Unbleached Kraft Pulp
Max.	Maximum
Min.	Minimum
M.P.	Maker Price
M.D.	Paper Machine Direction
N. BKP	Soft Wood Bleached Kraft Pulp
N. UKP	Soft Wood Unbleached Kraft Pulp
NCR	Non Carbon Paper
SBL	Strong Black Liquor
SS	Suspended Solid
SBKP	Straw Bleached Kraft Pulp
SUKP	Straw Unbleached Kraft Pulp
TAPPI	Technical Association of Pulp and Paper Institute
T. MP	Thermomechanical Pulp
TS	Total Solid
KUP	Unbleached Kraft Pulp
U.S.A.	United States of America
WBL	Weak Black Liquor
WL	White Liquor
WW	White Water
WWL	Weak White Liquor
S.R.	Unit of Freeness Measurement (Sehopper Riegler)

ABBREVIATIONS

bbl	Barel
cc	Cubic Centimeter
cft	Cubic Feet
cm^2	Square Centimeter
°C	Degree Centigrade
d	Dry
ft^2	Square feet
°F	Degree Fahrenheit
g	Gramme
gf	Gravity force
gal	Gallon
h	Hour
ha	Hectare
hp	Horse power
Hz	Hertz
%H	Brightness by Hunter
kg	Kilo Gramme
klit	Kilo Liter
km	Kilo Meter
km^2	Square Kilo Meter
kV	Kilo Volt
kVA	Kilo Volt Ampere
kWh	Kilo Watt Hour

ABBREVIATIONS

lbs	Pownds
lit	Liter
M	Month
m	Meter
m^2	Square Meter
m^3	Cubic Meter
mA	Mili Ampere
mℓ	Mili Liter
mm	Mili Meter
mm^2	Square Mili Meter
MW	Mega Watt
min	Minute
ppm	Parts per Million
Roe No.	Roe Chlorine Number
sec	Second
S.M.	Stere Measure
t	Ton
V	Voltage
y	Year
%	Percent
US$	United States Dollar
Rp	Rupiah
¥	Yen

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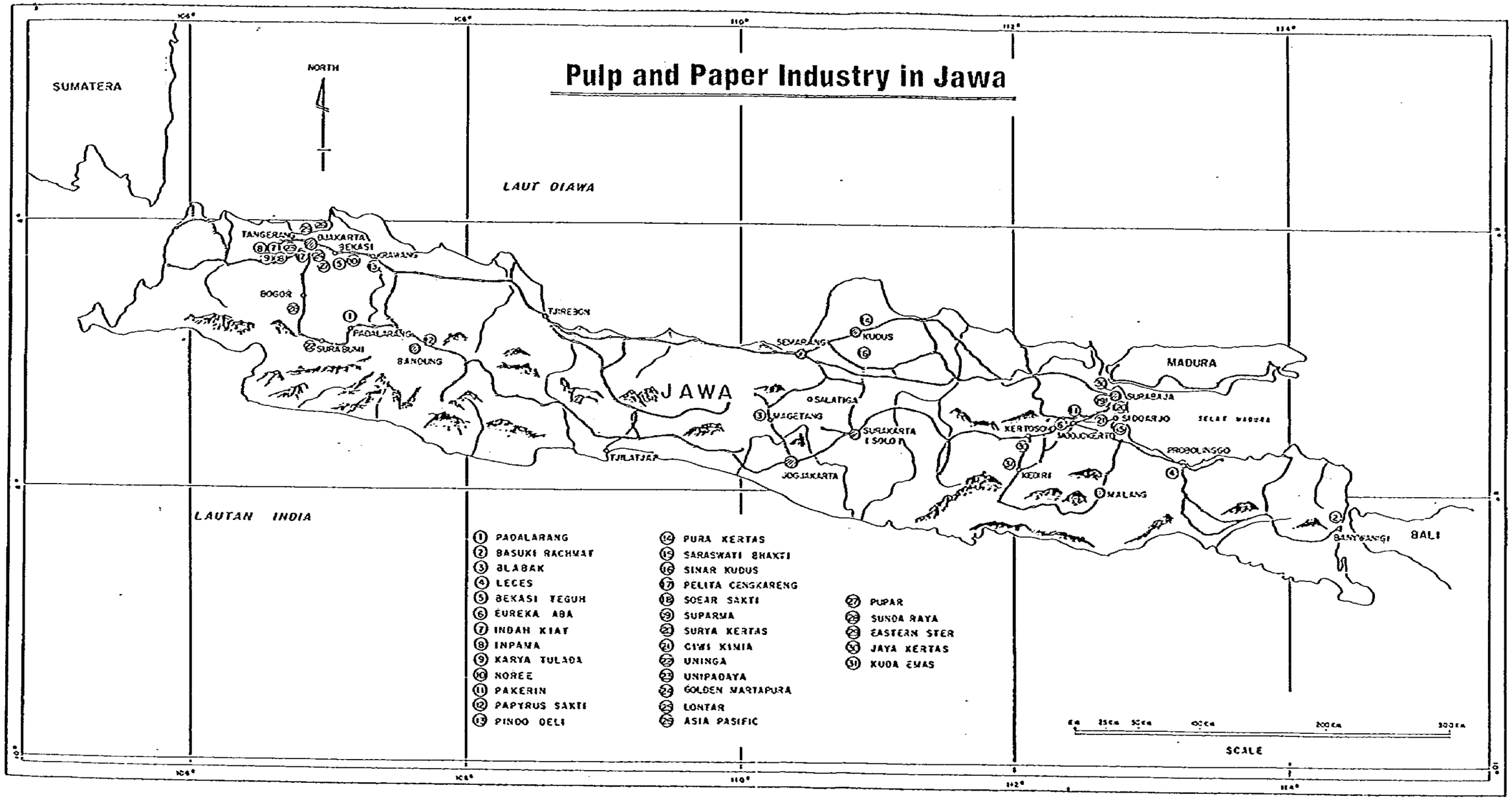

1. PADALARANG
2. BASUKI RACHMAT
3. BLABAK
4. LECES
5. BEKASI TEGUH
6. EUREKA ABA
7. INDAH KIAT
8. INPAMA
9. KARYA TULADA
10. NOREE
11. PAKERIN
12. PAPYRUS SAKTI
13. PINDO DELI
14. PURA KERTAS
15. SARASWATI BHAKTI
16. SINAR KUDUS
17. PELITA CENGKARENG
18. SOEAR SAKTI
19. SUPARMA
20. SURYA KERTAS
21. CIWI KIMIA
22. UNINGA
23. UNIPADAYA
24. GOLDEN MARTAPURA
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Major Data on Padalarang Paper Mill (current status vs. after renovation)

No.	Item	Unit	Common matters (bef./aft. renovation)	Unit I – PM1		Unit I – PM2		Unit II – PM3	
				Present	After renovation	Present	After renovation	Present	After renovation
A	General								
-1	Construction work/Builder			1922/Holland		1932/Holland		1975/Japan	
-2	Reconstruction work/Builder			1973/Japan		1973/Japan		–	
-3	No. of employees	person	785						
-4	Distance fr. Djakarta	km	150						
B	Mill operation		(present/after renov.)						
-1	Annual production	ADt/yr	6,706/8,084.5	2,022	2,979	1,745	2,201	2,939	2,904.5
-2	Annual sales	Rp 1,000/yr	9,235,723/10,997,433	3,432,548	4,368,344	1,185,152	1,832,876	4,618,023	4,796,213
-3	Total cost	Rp 1,000/yr	8,434,580/9,222,083	–	–	–	–	–	–
-4	Profit after tax	Rp 1,000/yr	353,550/685,914	–	–	–	–	–	–
-5	Major sales terr.			Djakarta, Bandong	ditto plus exp.	Djakarta, Bandong	ditto plus	Semarang, Surabaya	ditto
-6	Main grades mfd.			Specialty, P/W Drawing, Manila Carton	ditto plus exp. of straw pulp	Special thin, P/W	Semarang, Solo Medium-grade cigarette, special thin papers	Medium-grade cigarette, a small qty. of high-grade cigarette	High-grade cigarette, a small qty. of medium-grade cigarette
C	Main equipment								
-1	Self-use straw pulp plant	BD kg/d	5,400/10,500	–	–	–	–	–	–
-2	Pulp stock prep. plant	BD kg/d	–	11,800	13,800	3,500	10,000	11,000	12,000
-3	Paper plant (reel prod.)	AD kg/d	–	7,680	10,800	5,380	7,740	10,310	10,100
-4	Finishing plant (prod. finished)	AD kg/d	–	6,770	9,830	4,640	7,040	9,280	9,170
D	Utilities								
-1	Power contracted	kVA	3,120	–	–	–	–	–	–
-2	Power consumption	kwh/day	–	6,910	ab. 11,000	4,840	ab. 8,500	25,260	ab. 24,800
-3	Steam generating capacity	kg/day	228,000/336,000	–	–	–	–	–	–
-4	Steam consumption	kg/day	–	26,880	37,800	18,830	27,090	41,240	40,400
-5	Water in-take capacity	m^3/day	8,630	–	–	–	–	–	–
-6	Water consumption	m^3/day	–	1,150	1,300	807	930	1,550	1,520
-7	Effluent treating capacity	m^3/day	0/4,500						
E	Production efficiency								
-1	Total yield	%	–	76.4	85.7	78.1	86.6	86.0	86.0
-2	Total efficiency	%	–	68.5	77.2	67.2	73.8	82.0	82.0

INTRODUCTION

1. Background and Circumstances of Investigation

(1) In compliance with the request of the Government of Japan who had received a request from the Government of Republic of Indonesia, the Japan International Cooperation Agency determined to dispatch an investigation team to the Republic of Indonesia to evaluate the feasibility of the plant (pulp and paper) renovation project of Padalarang Pulp and Paper Mill (hereinafter called PPM) and Basuki Rachmat Pulp and Paper Mill (hereinafter called BRPP).

(2) The preliminary survey team, which had been dispatched prior to this investigation team, conferred with the Indonesian party during the period of December 21 to 28, 1983 as to the scope of investigation to be made and the preliminary survey team and the Indonesian party signed an agreement on December 26, 1983.

(3) Based on the said agreement, this investigation team conducted the field investigation during the period of February 26 to March 27, 1984 and reviewed the investigation results in detail. This writing reports the investigation results.

2. Purpose of Investigation

The purpose of this investigation is to make a diagnosis of BRPP and PPM and to study the feasibility of renovating the two mills, as well as to prepare a renovation program with the main target set on the higher efficiency of production and improvement of the product quality.

3. Scope of Investigation

In order to accomplish the purpose as described above, the investigation team confirmed the policy of the Ministry of Industry, Indonesia, surveyed the market conditions and investigated both mills on their operations, facilities and management practices. The investigation team integratedly evaluated the investigation results from the technical and financial viewpoints.

Chapter 1. SUMMARY OF RENOVATION PLAN

1-1 Future Prospects

(1) As a result of implementation of this renovation project, the profitability of the mill as a whole is expected to be improved.

The two paper machines of Unit 1 can perform better profitability with the renovation of equipment and can extend their life equipment-wise. Thus, the performance of Unit 1 will contribute adequately to the profitable operation of the mill, enabling accumulation of own equity to provide for the future expansion of PM 4.

Education and training of employees to be performed in parallel to the renovation of the equipment will bring about a successful result in augmenting the willingness and capability on the part of the whole employees to install an additional machine, PM 4.

(2) The future direction that PPM should choose is the exclusive manufacturer of thin papers and cigarette paper, in particular.

Looking into the balance of demand and supply of cigarette paper in Indonesia and the possibility of some private companies entering into the cigarette paper business in the future, somebody may have an illusion that the further expansion of the cigarette paper making equipment would be much risky as a national enterprise to choose. However, we are of the opinion that now is the time to pursue aggressive policy toward the expansion, taking into account the saving of foreign currency and the export of part of the production expanded.

(3) Indonesian pulp and paper industry holds the leading position among the five members of ASEAN. As regards the cigarette paper, no project is seen for the construction of a cigarette paper mill among the rest of four member countries even though there may be a concern about the over-supply of cigarette paper in the domestic market. The establishment of "the quality guarantee system", and the cost reduction efforts will enable PPM to secure export market without saying the stable sales to the domestic market.

I-2 Basic Policy of Renovation Plan

The objectives of this renovation project are to check up the defective parts of the existing equipment in operation in terms of productivity and cost of production, and to carry out remedial measures in an overall and concentrated way so that the mill will be reactivated. Education and training of the employees for the improvement of operational and managerial techniques are also an important phase of the project.

(1) Self-use pulp plant

1)	Improvement of pulp yield	Bl. pulp, from 25% to 35%
2)	Reduction of production cost	From Rp 499/kg to Rp 345/kg
3)	Improvement of unit consumption of steam	From 6.0 t/t to 4.5 t/t

(2) Unit I (stock preparation, PM 1, PM 2 and finishing)

Improvement of quality and total yield (from 76.4% to 85.7%) and improvement of various efficiencies and cost reduction.

1)	Improvement of total efficienty	From 68.53% to 77.17%
2)	Improvement of sheet making efficiency	From 86.95% to 95.43%
3)	Increase of machine speed	From 39.4 m/min to 51.4 m/min.
4)	Improvement of operation efficiency	From 90.8% to 89.7%
5)	Improvement of finishing yield	From 87.32% to 90.63%
6)	Stabilization of chemical add-on	

(3) Unit II (stock preparation, PM 3 and finishing)

Improvement of quality (minimizing weight variation) and partial change of grades to more profitable items.

1) Lessening of basic weight variation and reduction of sales loss due to over-weight
2) Reduction of unit consumption of power for refining
3) Development of products in bobbin

(4) Maintenance and utilities sections

Reduction of total cost is aimed at by improvement of facilities of the auxiliary sections also.

1) Improvement of steam cost
2) Standardization and simplification of parts by means of reinforcing the ability of own machine shop
3) Instrumentation system is to be improved
4) Better maintenance of water supply line
5) Reduction of loads in the effluent for the betterment of environments

(5) Others

The test room is to be equipped with more adequate facilities of measuring and testing of products.

(6) Improvement of the managerial and control technics by education and training of employees.

1-3 Equipment Renovation Plan (1)

Location	Breakdown of main equipment			Investment (Rp)	Effects expected	
	Description of equipment	Q'ty	Specification			
1. Self-use pulp plant				476,956,000		
	1. Straw cutter	1	3 ADt/d		1. Shortening of cooking cycle and increased prod.	Bl. pulp 5.42 to 10.5 BDt/d
	2. Belt conveyor	4	3 ADt/d		2. Improv. of cooking yield, reduc. fiber loss in effluent	25% to 35%
	3. Conveyor scale	1	3 ADt/d		3. Input ratio of straws to ton of pulp cooked is to be improved	6.0 to 4.5 t/t
	4. Digester overhaul	5				
	5. SUKP Dump chest	1	20 m³		Reduction of straw pulp cost	Rp 499 to Rp 345/kg
2. Unit 1						
Stock preparation	1. Hydra pulper & conveyor	1	10m³ x 110 kW	928,696,000	1. Stock consistency to be stabilized	Reduct. of sales loss due to over-wt. 10 to 5%
	2. Chest with agitator	4	20m³		2. Stabilization of freeness	
	3. Double disk refiner	1			3. Improv. of dust removal effect	
	4. CRC & head tank	4			4. Stabilization of chemicals add-on	
	5. Liquid cyclon	1				
	6. Vibrating screen	2			5. Expected value: Total eff. 68 to 76% Total yield 77 to 86%	
	7. Thickner	2				
	8. Clay storage tank	1	10m³			
	9. Dyes storage tank	2	2m³			
PM1	1. C.R.C. with head tank	1		825,217,000	1. Total eff. of PM1 is to be upper	68 to 78%
	2. Pressure screen	1	1.6 dia. 75 kW		2. Total yield is to be improved	77 to 86%
	3. Vibrating screen	1	20 dia.		3. Inreased machine speed and production due to renov. of drive part.	40 to 60 m/min.
	4. Table roll	22	80 dia. 2,500ℓ			
	5. Suction box	4				
	6. Suction couchroll	1	560 dia. 2,490ℓ			
	7. Shaking machine	1				
	8. Sectional DC drive	8				
PM2	1. C.R.C. with head tank	1		638,696,000	1. Total eff. of PM2 is to be upped	Same as PM1
	2. Suction box	4	200 width		2. Total yield is to be improved	Same as PM1
	3. Suction couchroll	1	560 dia. 2,490ℓ		3. Increased machine speed and production due to renov. of drive part	60 to 80 m/min.
	4. Chemical press	1	3-roll type			
	5. D.C. drive for couch	1	37 kW DCM			
	6. Lineshaft DC drive	1	45 kW DCM			
Finishing	1. Slitter rewinder	1	2,200W 1,500 dia.	279,304,000	1. Refinement of finished products and development of new market.	

1-3 Equipment Renovation Plan (2)

Location	Breakdown of main equipment			Investment (Rp)	Effects expected
	Description of equipment	Q'ty	Specification		
3. Unit 2				470,870,000	
	1. DDR	1	110 kW		1. Reduction of sales loss due to over-wt. 8% to 4%
	2. C.R.C. with head box	1			2. Improv. of power consumption rate for refining
	3. Hydro foil	5			3. Sales expansion of cigarette paper for rolling on machine
	4. Mark press backup roll	2			
	5. Bobbin slitter	1	1,200 width		
4. Maintenance and Utilities	1. Package boiler	1	14 kg/cm² x 14 t/h	839,957,000	1. Reduction of steam cost Rp 21,670/t to Rp 16,000/t
	2. Knife grinder	1			2. Reduction of fiber loss in the effluent
	3. Milling machine	1			3. Preventive maintenance system is to be set up by introducing instrumentations for various controls Thus, operating efficiency is to be improved.
	4. Mano-meter	1			
	5. Transformer	1			
	6. Effluent pond	1	500m³		
	7. Warehouse	1	500m²		
5. Others	1. Porosity meter	1		22,435,000	1. Quality stabilization is expected with intensified control.
	2. Niagara beater	1			

I-4 Education and Training

In parallel to the renovation of equipment, education and training of the employees should be made in order to solve various problems on management and controls. Education and training will be performed in the following manner:

(1) Education and training abroad

a. Number of persons: 14 persons in a total of 28 man-month

b. Contents: Quality control, operation control, equipment control, labor control and sales control

(2) Education and training at the mill site of PPM.

Under this renovation project, it is scheduled that the technical guidance should be rendered by foreign technical experts. These experts to be dispatched to PPM should endeavor to transfer the technical software as much as possible to the employees of PPM.

The number of foreign experts to be dispatched is scheduled to be six persons with a total of 12 man-month.

(3) Education and training programs to be continued
The following methods should be taken:

a. Opening of a course to give the employees the common sense of paper making as a whole.

b. By classifying the employees into several ranks, an education system should be established to hold several courses for freshmen, group leaders, superintendents, middle management class, etc.

c. Circle activities by jobsites and proposal systems should be introduced and the OJT (on the job training) should be actively pursued.

d. Establishment of overseas training system.

1-5 Implementation of Renovation Project

(1) We recommend that the overall scheme to secure the profit consistently and to contribute to the development of the area, where the mill is located, should be carried out, dividing it into short-term, middle-term and long-term plans.

a. Short-term plan

Improvement items pointed out by the investigation team during the field investigation and any items that can be started among the items described in this report are put into practice.

b. Middle-term plan

This renovation project is implemented as a major project in the fourth 5-year plan (1984 – 1988). The project is to start its work in 1985 and the whole work is to be completed in two years and two months.

c. Long-term plan

A new paper machine is installed as a project in the fifth 5-year plan (1989 – 1993) depending on the situation of fund availability, trend of the domestic market and results of the middle-term plan. In order to implement the plan, further study and review of the plan will be required.

(2) Implementation System

a. Since this renovation project is essentially a renovation project of the existing plant, we recommend that the control system that the plant possesses is fully utilized and at the same time, a renovation project execution team is organized.

b. In order to complete this project successfully, we recommend that PPM receives assistance of engineers of a foreign consultant or foreign paper making company, who have experience in such renovation work as this project.

(3) Implementation schedule

The renovation work is to be started in 1985 and completed within a period of 2 years and 2 months. The shutdown period of the paper machines for the renovation work will be 30 days, 21 days and nil for PM 1, PM 2, and PM 3 respectively.

(4) Total funds to be invested

a. Total funds to be required for the implementation of the middle-term plan follow:

		Unit: Rp 1,000
(A)	Equipment cost	4,237,999
(B)	Engineering fee	403,630
(C)	Construction work	1,240,891
(D)	Operation supervision	139,079
(E)	Training fee	211,270
(F)	Overhead	211,900
(G)	Contingency	429,144
	Total	6,873,913
(H)	Interest payable during renov. work	836,652
(I)	Repayment of loans	151,304
(J)	Initial working capital	120,739
	Grand total	7,982,608

b. Procurement of funds

Equity: 30% Long-term loan: 70%

(The terms and conditions for the loan are not decided yet. The above percentages are used provisionally for the purpose of financial calculations.)

	Foreign currenty	Local currency	Total
Equity	–	2,394,782	2,394,782
Long-term loan	5,026,087	561,739	5,587,826
Total funds invested	5,026,087	2,956,521	7,982,608

1-6 Financial Analysis and Economic Evaluation

(1) Conditions used for financial analysis

a. Conversion rate : US$1 = Rp1,000
: US$1 = ¥230

b. Fiscal term : January to December

c. Rate of effectuation of renov. work : 1987 (85%) 1988 and thereafter (100%)

d. Total funds invested and way of procurement

Equity : 30% Long-term loan: 70%

Unit: Rp 1,000

	Foreign currency	Local currency	Total
Equity	--	2,394,782	2,394,782
Long-term loan	5,026,087	561,739	5,587,826
Total funds invested	5,026,087	2,956,521	7,982,608

e. Rate of interest for long-term loans

Foreign currency: 12% Local currency: 16%

(The terms and conditions for the loan are not decided yet. The above interest rates are used provisionally for the purpose of financial calculations. Incidentally, the use of the provisional figures will not affect the I.R.R.O.I. substantially.)

f. Term of repayment of long-term loans

2-year deferment and repayment in 10-year even installment (once every year)

g. Depreciation

Machinery and equipment	10 years
Structure and buildings	30 years
Vehicles	5 years

h. Corporate tax

Corporate tax is to be imposed on the profit alone.

Profit ≦ Rp 10 million: 15% of profit
Rp 10 million < profit ≦ Rp 40 million: 25% of profit
Rp 40 million < profit 35% of profit

(2) Results of financial analysis

a. Profit and loss by years

As shown in the profit and loss calculation by years, Table 13-14-1, PPM can realize the profitable account throughout the period. Also, there will be no shortage of funds throughout the period.

b. The rate of operation corresponding to the break-even point will be improved to 79% after the renovation as against the present rate of 84%. The management of the mill will become more sound than now. (Ref. to table attached)

c. I.R.R.O.I. and pay-out period will be 13.8% and 5.10 years respectively.

The sensitivity analysis is shown below:
Plus or minus 5% of sales price

	−5%	0	+5%
I.R.R.O.I (%)	7.29	13.80	19.73
Pay-out period (yr)	6.88	5.10	4.06

Plus or minus 5% of the funds invested

	−5%	0	+5%
I.R.R.O.I. (%)	14.80	13.80	12.88
Pay-out period (yr)	4.89	5.10	5.31

The above analysis indicates that this investment is a worthwhile investment.

d. Financial indexes

The following indexes were studied:

- Ratio of net profit to sales (%) = $\frac{\text{Net profit aft. Tax}}{\text{Total sales}} \times 100$
- Ratio of profit to investment (%) = $\frac{\text{Net profit bef. Tax}}{\text{Total investment}} \times 100$
- Debt service ratio = $\frac{\text{Deprec. + Int. payable (long-term) + Net prof. aft. tax}}{\text{Repayment of long-term loan + Int. payable (long-term)}}$

Year	Ratio of net profit to sales	Ratio of net profit bef. tax to investment	Debt service ratio
1. 1987)	1.3 %	2.7 %	177.7 %
2. (1988)	3.5	7.2	205.1
3. (1989)	5.2	10.8	208.1
4. (1990)	6.2	13.1	215.6
5. (1991)	6.7	14.0	228.9
6. (1992)	7.1	14.9	244.1
7. (1993)	7.5	15.7	261.1
8. (1994)	7.8	16.4	279.9
9. (1995)	8.1	17.1	302.2
10. (1996)	8.4	17.8	328.9

Various indexes calculated show the smooth progress of financial capability of PPM. There is no concern about the financial situation. The rate of profit is at a reasonable level.

Table 13-14-1 Annual Statement of Profit and Loss

(Unit: 1,000 RP)

Items	Present	- 2 (1985)	- 1 (1986)	1 (1987)	2 (1988)	3 (1989)	4 (1990)	5 (1991)	6 (1992)	7 (1993)	8 (1994)	9 (1995)	10 (1996)	Remarks
Sales	9,235,723	9,235,723	8,976,683	10,674,711	10,997,433	10,997,433	10,997,433	10,997,433	10,997,433	10,997,433	10,997,433	10,997,433	10,997,433	
(Q'ty, t)	(6,706)	(6,706)	(6,508)	(7,845.3)	(8,084.5)	(8,084.5)	(8,084.5)	(8,084.5)	(8,084.5)	(8,084.5)	(8,084.5)	(8,084.5)	(8,084.5)	
Manufacturing cost														
Variable cost	5,722,949	5,722,949	5,577,196	6,623,233	6,652,922	6,652,922	6,652,922	6,652,922	6,652,922	6,652,922	6,652,922	6,652,922	6,652,922	
Personnel expenses	1,526,264	1,526,264	1,526,264	1,526,264	1,526,264	1,526,264	1,526,264	1,526,264	1,526,264	1,526,264	1,526,264	1,526,264	1,526,264	
Depreciation (present) (A)	328,657	328,657	328,657	328,657	328,657	112,816	0	0	0	0	0	0	0	
Depreciation (new) (A)	0	0	0	786,187	786,187	786,187	786,187	786,187	786,187	786,187	786,187	786,187	786,187	
Other fixed cost	309,000	309,000	309,000	309,000	309,000	309,000	309,000	309,000	309,000	309,000	309,000	309,000	309,000	
Total	7,886,870	7,886,870	7,741,117	8,973,341	9,003,030	8,787,189	8,674,373	8,674,373	8,674,373	8,674,373	8,674,373	8,674,373	8,674,373	
Operating income	1,348,853	1,348,853	1,235,566	1,701,370	1,994,403	2,210,244	2,323,060	2,323,060	2,323,060	2,323,060	2,323,060	2,323,060	2,323,060	
Selling expenses	180,500	180,500	180,500	180,500	180,500	180,500	180,500	180,500	180,500	180,500	180,500	180,500	180,500	
Administrative expenses	367,210	367,210	367,210	367,210	367,210	367,210	367,210	367,210	367,210	367,210	367,210	367,210	367,210	
Total	547,710	547,710	547,710	547,710	547,710	547,710	547,710	547,710	547,710	547,710	547,710	547,710	547,710	
Total cost	8,434,580	8,434,580	8,288,827	9,521,051	9,550,740	9,334,899	9,222,083	9,222,083	9,222,083	9,222,083	9,222,083	9,222,083	9,222,083	
Interest payable														
Present	264,912	264,912	264,912	264,912	264,912	264,912	264,912	264,912	264,912	264,912	264,912	264,912	264,912	
New (Long-term loan)	0	0	0	584,974	530,652	475,826	421,000	366,178	311,352	256,530	201,704	146,878	92,057	
New (Short-term loan)	0	0	0	89,878	73,878	57,878	41,878	25,878	9,878	0	0	0	0	
Total	264,912	264,912	264,912	939,764	869,442	798,616	727,790	656,968	586,142	521,442	466,616	411,790	356,969	
Profit	536,231	536,231	422,944	213,855	577,251	863,918	1,047,560	1,318,382	1,189,208	1,253,908	1,308,734	1,363,560	1,418,381	
Corporation tax	182,681	182,681	143,030	69,864	197,038	297,371	361,646	386,434	411,223	433,868	453,057	472,245	491,433	
Profit after tax (B)	353,550	353,550	279,914	144,032	380,213	566,547	685,914	731,948	777,985	820,040	855,677	891,314	926,948	
(A + (B)	682,207	682,207	608,571	1,258,876	1,495,057	1,465,550	1,472,101	1,518,135	1,564,172	1,606,227	1,641,854	1677,501	1,713,135	
Loan repayment (Foreign)				452,655	456,870	456,870	456,870	456,870	456,870	456,870	456,870	456,870	456,870	
Loan repayment (Local)				100,000	100,000	100,000	100,000	100,000	61,739	0	0	0	0	

Table 13-15-1a Break-even Point for Every Kind of Paper

PM	Kinds	Basis weight	Present					Improved					Remarks
			Daily production	Operation profit	Fixed cost	Break-even point	Ratio of operation	Daily production	Operation profit	Fixed cost	Break-even point	Ratio of operation	
			t/D	Rp/kg	1000 Rp	t/day	%	t/day	Rp/kg	1000 Rp	t/day	%	
1	H.V. Offset Pth	60	6.98	33.8	3,264	96.6	1,384	9.90	247.8	4,254	17.2	174	
	Cylostyle Pth	69	9.22	15.2	3,264	214.7	2,329	11.25	179.1	4,254	23.8	212	
	Mail zegel	80	4.99	1,202.8	3,264	2.7	54	8.91	1,426.4	4,254	3.0	34	
	Banderol	60	6.91	1,588.8	3,264	2.1	30	9.26	1,824.9	4,254	2.3	25	
	Reform	120	7.62	473.6	3,264	6.9	91	9.87	672.0	4,254	6.3	64	
	S.P.R. Biasa	80	5.82	1,282.7	3,264	2.5	43	9.75	1,588.6	4,254	2.7	28	
	Cheque putih	100	5.24	125.8	3,264	25.9	494	9.60	314.1	4,254	13.5	141	
	Kertas water mark	100	4.99	718.2	3,264	4.5	92	9.40	959.7	4,254	4.4	47	
	Post wesel	175	7.49	59.2	3,264	55.1	736	10.08	244.7	4,254	17.4	173	
	Kartu post Ch	175	7.49	7.2	3,264	453.3	6,052	10.15	189.7	4,254	22.4	221	
	Couverture warna	60	7.49	450.5	3,264	7.2	96	10.43	499.8	4,254	8.5	81	
	Omslog warna	80	7.83	62.6	3,264	52.1	665	11.18	107.6	4,254	39.5	353	
	Omslog warna	200	8.87	42.9	3,264	76.1	858	11.55	86.7	4,254	49.1	425	
	Omslog biru tua	70	8.23	− 83.4	3,264	–	–	11.39	− 48.5	4,254	–	–	
	Straw pulp export	200						10.63	417.8	4,254	10.2	96	
	PM1 average		6.78	923.4	3,264	3.5	52	9.99	892.1	4,254	4.8	48	
2	H.V.S. Putih	50	6.81	− 536.4	3,264	–	–	9.56	−346.2	4,254	–	–	
	Cylostyle Pth	69	9.22	15.2	3,264	214.7	2,329	11.25	179.1	4,254	23.8	212	
	Doorslag Pth	28	3.18	− 27.8	3,264	–	–	5.11	145.8	4,254	29.2	571	
	Bank post	44	4.65	− 50.6	3,264	–	–	7.93	178.8	4,254	23.8	300	
	Sigaret putih	26	3.18	345.8	3,264	9.4	296	5.29	579.2	4,524	7.3	138	
	Kraft coklat	45	6.80	62.8	3,264	52.0	765	8.92	98.3	4,254	43.3	485	
	PM2 average		5.87	7.6	3,264	429.5	7,317	7.41	242.5	4,254	17.5	236	
	PM1 & 2 average		6.33	499.2	3,264	6.5	103	8.70	616.1	4.254	6.9	79	

(1) Annual fixed cost (present)

	1000 Rp	(1000 Rp)
Personnel expenses	1,526.264	(1000 Rp)
Depreciation	328.657	
Other fixed cost	309,000	
Selling expenses	180,500	
Administrative expenses	367,210	
Interest paid	264,912	
Total	2,976,543	

2,976.543 (1000Rp) ÷ 911.95 (day)
= 3.264 (1000 Rp/day)

(2) Annual fixed cost (after improved)

	1000 Rp
Personnel expenses	1,526.264
Depreciation	863,200
Other fixed cost	309,000
Selling expenses	180,500
Administrative expenses	367,210
Interest paid	633,554
Total	3,879,728

3,879,728 (1,000 Rp) ÷ 911.95 (day)
= 4,254 (1000 Rp/day)

Table 13-15-1b Break-even Point for Every Kind of Paper

PM	Kinds	Basis weight	Present					Improved					Remarks
			Daily production	Operation profit	Fixed cost	Break-even point	Ratio of operation	Daily production	Operation profit	Fixed cost	Break-even point	Ratio of operation	
			t/D	Rp/kg	1000 Rp	t/day	%	t/day	Rp/kg	1000 Rp	t/day	%	
3	Goldenbird	26	9.39	538.6	3,264	6.1	65	9.39	559.2	4,254	7.6	81	
	Silver bird	26	9.20	570.6	3,264	5.7	62	9.20	589.9	4,254	7.2	78	
	Sig. Eagle	26	8.54	748.3	3,264	4.4	52	8.54	773.4	4,254	5.5	64	
	Sig. Coklat	26	8.54	518.4	3,264	6.3	74	8.54	538.8	4,254	7.9	92	
	PM3 average		9.28	555.4	3,264	5.9	64	9.17	603.6	4,254	7.0	76	
	Total average		7.35	523.8	3,264	6.2	84	8.87	611.6	4,254	7.0	79	

(3) Economic evaluation

a. The management and operation of the mill will become more sound and smooth. As a result, PPM will be in a position to further contribute toward the development of the area, where the mill is located, and the stable employment of labor in the area.

b. Better utilization of domestic resources.

c. By way of the increased production of cigarette paper, PPM can serve for a saving of foreign currency. In addition, export of straw pulp will be useful for securing increased earning in foreign currency.

Chapter 2. SUMMARY OF INVESTIGATION RESULTS

2-1 Government Policy of Indonesia Toward Pulp & Paper Industry

2-1-1 Policies Given to Pulp and Paper Industries

1) The Indonesian Government sets a policy of completing three major expansion and new installation projects in the fourth 5-year plan (1984 – 1988), satisfying the domestic demand for newsprint paper, kraft paper and kraft liner, as well as developing the paper industry into an export oriented industry.

2) The existing paper mills are still far from being competitive in the international market both on the quality and cost, and these mills require protection by means of tariff and others.

3) For this reason, The Indonesian Government takes measures to encourage to optimization and rational enlargement of the existing paper mills for the purposes of establishing the foundation as an export industry as far as it is possible.

2-1-2 General Policies toward Basuki Rachmat Pulp and Paper Mill and Padalarang Pulp and Paper Mill

1) The Indonesian Government has set the major policies as follows:

a) Optimization of production scale
b) Production of grades that are internationally competitive
c) Effective use of domestic raw materials and import restrictions
d) Activation and stabilization of employment as regional industries
e) Switch to an export-oriented industry
f) Raising of equipment efficiencies with relatively small investment
g) Change to an energy saving industry
h) Utilization of secondhand equipment will be permissible
i) Necessity for education of all the employees

2-2 Market

2-2-1 Demand and Supply of Paper in Indonesia (Government statistics)

1) Production, import, export and consumption

	Production t/y		Export/Import t/y		Consumption	
	Actual	Capacity	Export	Import	t/y	Kg/capita
1982	329,688		5,200	306,955	631,483	4.20
1983	374,379	505,000	10,706	267,105	630,778	4.10
1984		676,000		228,850	670,000	4.30

2) According to the statistics of production, import, export and consumption of paper in Indonesia during the period from 1976 to 1983, printing and writing paper is in the status of over-supply while the most part of specialty paper and cigarette paper are dependent upon imports.

In addition, the demand and supply forecast in the future until the year of 1990 indicates that the printing and writing paper will continue to be in the status of over-supply.

2-2-2 Estimated Requirement of Specialty Paper

Official statistics on individual items of specialty paper are not available. The investigation team made their own survey, getting information from private sources and so on. Demand estimate thus obtained is shown in the table attached.

Selection of some promising grades for future production is to be made out of various grades listed on the Table.

The prices of various types of specialty paper are kept much higher than printing and writing paper owing to the tariff protection at a higher rate.

Table 3-3-1 Forecast of Demand for Paper (1984 – 1990)

Unit: ton

Kinds	1983	Growth Rate	1984	1985	1986	1987	1988	1989	1990
Glassine Paper	1,700	0 %	1,700	1,700	1,700	1,700	1,700	1,700	1,700
Greased-proof Paper	1,200	1	1,212	1,224	1,236	1,248	1,260	1,273	1,700
Carbon Base Paper	2,000	2	2,040	2,080	2,120	2,160	2,203	2,247	2,292
N.C.R.	2,400	5	2,520	2,646	2,778	2,917	3,063	3,216	3,377
Base Paper for Lamination	2,000	9.5	2,190	2,398	2,626	2,875	3,148	3,448	3,776
Manifold	7,500	5	7,875	8,269	8,682	9,116	9,572	10,051	10,554
Ribbed Kraft Paper	7,500	9.5	8,213	8,993	9,846	10,782	11,807	12,928	14,156
Onion Skin	150	2	153	156	160	162	165	169	172
Soap Wrapper	1,500	5	1,575	1,654	1,736	1,823	1,914	2,010	2,111
Tracing Paper	100	9.5	110	120	131	144	157	172	188
Cigarette Paper	15,000	7	16,050	17,174	18,376	19,662	21,038	22,511	24,086
Computer Paper	3,600	20	4,320	5,184	6,221	7,465	8,958	10,750	12,900
Transfer Paper	240	2	245	250	255	260	265	270	275
W/P Pap. (incl. coated paper)	160,000	5	168,000	176,400	185,220	194,481	204,205	214,415	225,136
Newsprint	120,000	5	126,000	132,300	138,915	145,860	153,154	160,811	168,852
Kraft Liner, Corrugating medium	250,000	9.5	273,750	299,976	328,223	359,415	393,560	430,945	471,885
White Board	105,000	9.5	114,975	125,898	137,858	150,954	165,295	180,998	198,193
Sack Kraft	45,000	5	47,250	49,613	52,093	54,698	57,433	60,304	63,319
Total	724,890		778,178	836,035	898,185	965,722	1,038,897	1,118,218	1,204,258
Population (estimation): mil.	158.1		161.6	165.2	168.7	172.2	175.6	179.1	182.7
Consumption per capita	4.6		4.8	5.1	5.3	5.6	5.9	6.2	6.6
IPPA'S ANNOUNCEMENT	630,778		709,000	790,000	864,000	949,000	1,140,000	1,270,000	–
Consumption per capita	4.0		4.4	4.8	5.1	5.5	6.5	7.1	–

2-2-3 Characteristics of PPM looked from the market

1) Grades of products

a. The products of Unit I (the older line, having two paper machines) are favored with the Government protection, this unit having the longest history as the paper mill in Indonesia. However, the demand for their products is levelling off due to the coming of the competitive products made by the other companies into the market and also due to the sluggish growth in demand in general. Under the circumstances, it is found difficult to fill the machine spaces with profitable grades alone. So, the commodity type of paper for general use is also made on the machines. The cost of production at Unit I, however, is very high. It is difficult for PPM to compete with the other makers in the sector of commodity type of paper.

The surplus capacity which becomes available from the increased production should be used for the production of medium grade cigarette paper. As for the surplus of straw pulp, it should be sold for export.

b. Unit II (the naming for the latest line), started operation 10 years ago as the only cigarette paper machine in Indonesia. The higher grade of cigarette paper competitive in quality with the foreign cigarette papers imported should be made on the machine on a trial basis with a view to save the foreign currency spent for the imports of cigarette paper. For this purpose, PPM should build up enouch production technology and marketing ability.

2) Geographical position

a. The sales territories of Unit I consist of 85% in Djakarta area and 25% in Bandung area. Thus, the mill is favorably located in the proximity of the consuming areas.

b. The sales territories of Unit II consist of the middle part of Jawa and eastern Jawa.

The location of Unit II is not ideal. In view of relatively high added value product, however, the transportation cost incurred to some extent will not be critical to the sales of cigarette paper to the useres at a distance.

3) Users

a. More than 50% of Unit I products are for governmental or semi-governmental use.

b. The users of Unit II products are Tabacco manufacturers for producing hand-rolled cigarette.

The equipment of Unit II should be renovated for allowing production of higher-grade cigarette paper for use of machine-rolled cigarettes at tabacco factories.

4) Production equipment and cost of production

a. Although Unit I is an unique equipment, production cost is remarkably high by about Rp 200/kg. It is needless to say that efforts should be made seriously to lower the cost of production. On the other hand, the ratio of the production of specialty paper should be raised, utilizing the specialized production facilities endowed to Unit I. The sales development of specialty paper is to be pursued, at the same time.

b. Unit II has no defect equipment-wise for production of cigarette paper. The installation of a new bobbin slitter is required for production of cigarette paper in bobbin. Measures should be taken to lessen the sales loss due to the over-weight of the product. Thus, an improved profitability should be aimed at.

5) Market evaluation of mill products and sales price

a. Unit I produces a high percentage of specialty paper. The products are sold at relatively good prices irrespective of their quality. However, the market needs are for improved and stable quality.

b. The products of Unit II are sold at much lower prices as compared with imported paper as shown below.

SILVER BIRD	Rp 6,300/riem
GOLDEN BIRD	Rp 6,500/riem
EAGLE	Rp 8,500/riem
Imported	Rp 10,000 to 15,000/riem

Establishment of production technology to compete with imported paper and the market development are critically needed.

2-3 Current Situation of Mill

(1) Circumstances of Establishment

As the first paper mill in Indonesia, it was established in 1923. In 1924 the paper machine No. 1 started the production of writing and printing paper and specialty paper for governmental use utilizing straw pulp as raw material. In 1932 the paper machine No. 2 was installed additionally.

In 1975 the paper machine No. 3 was installed receiving the Japanese cooperation, and started the operation as unique cigarette paper producing machine in Indonesia.

(2) Location: Padalarang City, Bandung Prefecture, Western Jawa State

(3) Plant site: 10 ha

(4) Sales records (1983)

Unit I	(Paper machines No. 1 and 2)	4,067 t
Unit II	(Paper machine No. 3)	3,007 t

(5) Number of Employees: 785 (1983)

(6) Main Installations (as of 1984)

a. Pulp equipment:

5.9 ADt of daily production, 5 units of vertical digester and 1 unit of globe digester

b. Paper making equipment:

Paper machine No. 1 10t of daily production, 2,400 mm of wire width
Paper machine No. 2 2.5 t daily production, 2,250 mm of wire width
Paper machine No. 3 10 t of daily production, 2,440 mm of wire width

c. Finishing equipment: 1 set

d. Utilities

Power source	Purchased power	3,120 KVA
	own generation	220 kW x 3
Steam	Boiler	4 units
	Capacity	9.5 t/h
Mill water	Fountain	8,630 m^3/d

2-4 Review of Managerial and Control Problems

2-4-1 Mill Management

Varieties of products are manufactured on the three paper machines. Processes are rather complicated and some of them are old fashioned. Yet, the mill management is well performed.

2-4-2 Quality Control

Quality control is well performed. For the betterment of the mill performance, however, it will be necessary to set up the quality guarantee system. For this purpose, all the division and sections, namely, management, production, engineering, maintenance, research and development, clerical, accounting, purchasing, sales and so on should participate in TQC to develop quality consciousness and challenging attitude to problems in a collective effort.

2-4-3 Production Control and Sales Control

1) It is important to reinforce the sales force to provide for the increased production. The sales organization should be strengthened and capable men should be positioned in such organization.

2) The environments of the jobsite should be improved. The book keeping system should be well maintained for enabling prompt and correct actions on necessary controls.

2-4-4 Purchase Control

1) Moisture content of purchased straws should be checked more severely.

2) For the production of higher grade cigarette paper, the selection of CaC03 of better quality should be re-studied.

2-4-5 Operation Control

Definitions of total yield, total efficiency, operation efficiency, finishing yield, etc. should be clarified. The target values should be set per respective grades and operation control should be performed accordingly.

2-4-6 Cost Control and Finance Control

Data on cost control and finance control are kept on hand well. The problem is how to utilize those data in direct connection with operation control for the lifting of cost consciousness of the operators.

2-4-7 Equipment Control

1) Although most of the equipments are aged, those are well maintained with repair expenses as low as less than 5% of the total sales.

However, introduction of preventive maintenance is recommended, taking into consideration the economical balance between a certain increase in the cost of repair

and the merit obtained by such repaires made along the principle of preventive maintenance.

2) Steam cost represents 10 to 30% of production cost. Heat control should be thoroughly pursued.

3) Mill water must be saved more strictly. Recovery of pulp stock and chemicals must also be made more effectively.

2-5 Review of Various Technical Problems

We pointed out the problems to be improved or corrected in regard to the present way of operations, various controls and the defective part of equipment, etc. It is hoped that our recommendation be put in practice, starting from whichever practicable, with a view to make them use for the stabilization of quality and improvement of profitability.

2-5-1 Self-use Pulp Plant

1) Moisture content of purchased straws has an average of 40%. Some of them are in the state of rotting having more than 50% of moisture content. Such straws of defective quality causes lowering of cooking yield. More strict control is required for collection, acceptance and storing of straws.

2) The existing straw cutter is obsolete and does not work to cut the straws properly. It should be replaced by a new cutter.

3) Due to the defective packing gland of digesters, the cooking time has a wide variation.

4) Due to the unstable consistency of the stock at the dust removal process, the dust removal efficiency is lowered and fiber loss in the effluent becomes higher, resulting in the trend of lowering the pulp yield down to 25% of late.

Measures to lessen the fiber loss in the effluent is required by means of installation of C.R.C., keeping in good condition of Cowan screen, basket, etc.

2-5-2 Unit I (PM 1 & 2)

1) Stock Preparation

(1) Pulper is used for dissolving of pulp. No control is made to the add-on of water, resulting in a consistency variation. Control is to be made on the water add-on. Installation of C.R.C. is required.

(2) Due to the improper way of feeding pulp and the handling of broke in sorting and moving, the pulp stock is contaminated with dirts and foreign matter.

The strengthening of dust removal facilities and the control of the working conditions are required.

(3) The use of DDR for refining of pulp stock is not controlled adequately. The operators should become skilled in the operation of it.

(4) Mixing of pulp stock is the main function of the beaters.
The beaters are aged and not maintained in good condition, resulting in the contaimination with dirts and foreign matter and the variation of stock consistency.

The beaters should be removed to the change to the refiner chest system. The rate of chemicals add-on should be kept uniform.

2) PM 1

Total yield	76.4%
Total efficiency	68.53%
Production finished	6.77 t/d
Range of basis weight	50 to 200 g/m²
Quality of products	A lot of dirts and pinholes seen, quality being deteriorated.

As shown above, PM1 has many problems in terms of total efficiency and quality of products. More strict control of stock consistency and intensified dust removal system are

required. The improvement of dewatering device on the wire part and the drive system are also required.

3) PM2

Total yield	78.1%
Total efficiency	67.2%
Production finished	4.64 t/d
Range of basis weight	26 to 69 g/m²
Quality of products	A lot of dirts and pinholes seen, quality being deteriorated.

As shown above, PM2 also has many problems in terms of total efficiency and quality of products. More strict control of stock consistency and intensified dust removal system are required. The improvement of dewatering device on the wire part and the drive system are also required.

2-5-3 Unit II (PM3)

No serious problems are found with the equipment and operations. Quality-wise, however, there is a slight handicap as compared with the imported cigarette paper. The change of CaC03 to the better grade produced in France, etc. must be tried to make test samples with a view to improve the product quality.

The higher rate of power consumption is peculiar to the mill making thin papers. When the refining equipment is to be additionally installed in the future, disk refiner, conical refiner, etc. should be introduced to use more cutting of fibers in the refining process for the reduction of power consumption. At the same time, the lessening of creases caused by non-uniform drying of sheet could be achieved.

2-5-4 Finishing Section

The recent needs of the market are for more products in roll and in bobbins. Under this renovation project, the installation of a rewinder and a bobbin slitter is scheduled.

2-5-5 Maintenance and Utilities

1) Boiler

The three boilers out of the existing four boilers are outdated and have very poor heat generating efficiency. Thus, the average steam cost at PPM is as high as Rp 21,670/t. With the use of the latest type of water tube boiler, steam cost on the average should be about Rp 16,000/t in view of its factor of evaporation. Installation of a water tube boiler to replace the existing old boilers is required.

2) Water supply

The source of the mill water is fountains in the mountainous area. The effective amount of water available is 100 lit./sec as against the right of procurement of 200 lit./sec (nearly 17,000 m^3/d).

The elevated water tank in the mill stite is time-worn and is not used. Hence, the variation of water pressure takes place, causing adverse effect on the quality of products. The old elevated water tank should be replaced by a new tank for reducing the flucturation of water pressure.

3) Effluent Facilities

The government regulations set forth pollution control measures to the group of factories newly constructed at a certain developing area. The central government, however, has to deem stabilization of employment as the first priority given to existing factories. As to the pollution problems, only mild control is executed by the local government agencies. As a matter of fact, PPM has no facilities to treat the effluent. The effluent is being discharged into the adjacent paddy field. Farmers rather welcome it because it is useful as fertilizer.

PPM should construct a simple type of sedimentation pond for the recovery of fibers in the effluent. At the same time, the load contained in the effluent should be reduced with the use of the said pond.

4) Maintenance of machinery and equipment

Machine tools are old fashioned. Even if they can be used, the problems are lack of accuracy of the machining work and low working efficiency.

With the installation of new machine tools, the preventive maintenance system should be established and standardization, simplification and inter-changeability of parts are to be realized.

2-6 Raw Materials for Pulp

(1) Straw, bagasse, corn stalks, etc. are usable as the materials of the general types of paper. PPM has a long experience in the making of straw pulp. Due to the recent improvement of the species of the rice plant, the procurement of MERANG PANJANG has become difficult. The most part of the straw now collected are MERANG KAPALA and JERAME (92%), which have very high moisture content of about 40%. The quality of straw has deteriorated and the amount of supply is not stable. It is learnt that PPM is considering the use of bagasse and corn stalks as the substitute for straws. Bagasse may be available in the amount of 3,000 ADt per year from the CIREBON sugar plant. As to corn stalks, however, the amount collectable and the methods of collection are questionable. In addition, crusher and sorter will be required for removal of pith. The treatment of a relatively small amount of corn stalks will not be payable in view of the pith removing equipment to be invested. Rather than to seek for the substitute materials, the strengthening of the straw collection setup and the guidance to the collectors on the effective way of collection and the proper way for the storage should be pursued so that the increased collection of straws having uniform quality can be assured.

(2) ROSELA as a material for cigarette paper has been test cooked and made into paper on the commercial line. The reasons for not being used now are the increased price of the raw ROSELA up to Rp 500/kg (three times as high as the past price). At this price, it is not attractive as the material for cigarette paper. In addition, the use of ROSELA causes pinholes in the sheet. It is not a desirable material for use at PPM.

(3) As a raw material, the cultivation of LINUM is in the progress and test cooking of it into pulp is being carried out. The LINUM is so-called flax, which is widely used as the material for cigarette paper in many countries.

We have already made technical assistance to PPM in 1978 on the cooking of flax produced in Mainland China. It is practicable to make pulp from flax in the quantity of 1,000 AD kg with the existing equipment of PPM.

When the existing cooking equipment becomes obsolete and the scrap and build becomes necessary, considerations should be given to the installation of a continuous cooking equipment to treat the necessary amount of straws, bagasse and flax with it.

The timing should be matched with the installation of PM 4 in order to optimize the effect of investment. It is hoped that PPM will keep this matter in mind as the future problem.

2-7 Comment on Additional Installation of PM 4

2-7-1 Background of PM 4 Project

1) PPM has a long history of making cigarette paper, having technical capability of manufacturing low and medium grade cigarette paper as well as semi-high grade cigarette paper.

2) PPM now produces 25% of the domestic demand for cigarette paper. The rest of 75% of requirement is still dependent upon the imported cigarette paper.

3) PPM had been given a license to produce 6,000 tons of cigarette paper by the Ministry of Industry. PPM filed a practical plan to meet the license with the Ministry of Industry in 1978.

4) For the future development of PPM themselves and for the development of the area where PPM is located, an early materialization of PM 4 project is desirable.

2-7-2 Problems to be Faced with

1) Tabacco industries ate rather conservative. Unless the stable supply of cigarette paper having satisfactory quality competitive with the imports cigarette paper is made sure, successfull sales to new customers will be difficult to achieve.

2) Unless production of cigarette paper equivalent to the French products is attainable, PM 4 will not bring a profit.

3) Some of the tabacco manufacturers and paper mill have a strong will to manufacture cigarette paper by themselves. If all these plans come to a realization, there may be an over-supply of the cigarette paper domestically made.

2-7-3 PM 4 Plan in Relation to This Renovation Project

1) Under this renovation project, PM 3 will be made possible to produce semi-high grade cigarette paper in the quantity of 440 tons per year.

   a. Physical characteristics of EAGLE brand now produced will be kept unchanged. The appearance quality will be improved (removal of slime and dirts). Such an improved product will be delivered to the users to sound their evaluation. The sales of the improved product should be developed steadily in this manner.

   b. Improvement of quality up to the level of French product

      In order to improve softness, combustibility and marking appearance, which are the points inferior to the French products, the change of CaC03 to the French produce should be tested. Improved samples of the product thus manufactured should be submitted to the users for evaluation purposes. Taking account of the market reaction, further improvement of quality should be pursued if needful with the final target of the market development.

2) Intensified sales activities

   The visitation of users should be made at least once a month for collection of customers' information, their needs for the quality and for prompt action against any claims or complaints. For such purposes, education of salesmen to give them sufficient knowledge about the product is an important matter.

3) The production ratio of high grade cigarette paper should be raised and the market share of it should be stepped up. Such activity based on the long-range vision to prepare for the PM 4 project is of prime importance. We take it that the PM 4 project is a problem to be taken up within the scope of a long term plan.

2-8 N.C.R.

2-8-1 N.C.R. Reviewed from The Market

Annual requirement in 1982 in Indonesia is estimated at 2,000 tons. For 10 years to come, annual growth of demand is estimated at 5%. Until 1982, all the NCR has been imported in the processed and completed form. P.T. Pusakarya commenced secondary processing of NCR in 1983 with the use of the base papers imported. In addition, P.T. Ciwi Kimia and P.T. Pakerin have been planning integrated production from base paper to secondary processing of NCR. The over-supply of NCR is foreseen in the near future. It will be difficult to enter into the NCR market.

2-8-2 N.C.R. from Technical Viewpoint

1) The base paper is mainly 40 g/m²

   a. free from pin-holes
   b. free from dirts and foreign matter
   c. dimentional stability

2) Conditions for production of base paper

   a. Chemical woodpulp, thorough removal of dirts is required.
   b. Paper machine should be equipped with pin-hole and dirts detector.

3) Coloring agent (micro capsule) and developing agent are patented chemicals. Licensing of the patents is required.

4) Air-knife coater is generally used for coating the coloring agent in capsule. In case of resin type of coloring agent, high consistency coating is applied with the use of roll coater or blade coater. The installation is very expensive.

5) Cautions to be paid for processing and for finished products

   a. Any dirts of foreign matter contained in the base paper will cause sheet break in the coating process, low coating efficiency and the loss of paper and coating chemical.

b. Any dirts on the paper will cause confusion with the dotts typed.

c. Any pin-holes in the base paper will cause strike-through of the coloring agent resulting in serious troubles.

d. Caustion must be paid for handling the products. Improper handling will cause coloring of the products and the value as the product will be lost.

As mentioned above, the manufacture of the base paper of NCR involves various technical problems. This renovation project will not include NCR as the item to be developed. However, the plan to manufacture NCR should not be given up totally. The mill shoud plan to manufacture the base paper on the trial basis some day and have it test coated on the test coater to be installed at the training center. In so doing, the mill should learn how to make the base paper and how to coat it to complete the finished product.

CONCLUSION AND RECOMMENDATIONS

CONCLUSION AND RECOMMENDATIONS

1. This study was carried out to take the form of renovation with the target that PPM will maintain profitability for years to come pursuing the means enabling PPM to contribute to the development of the area as a sole paper and pulp enterprise in the area toward the future and that PPM will strengthen the foundation enabling it to take a great stride forward at the next stage such as installation of a new paper machine.

2. The outline of the best available plan is as follows:

   1) Means for reduction of production cost (Unit 1)

      a. Reduction of cost of self-made bleached pulp (Rp 499/kg to Rp 345/kg) and increased production (5.42 BDt/d to 10.5 BDt/d)

      b. Reduction of steam cost (Rp 21,670/t to 16,000/t)

      c. Saving of resources by means of improving the total yield (77% to 86%)

      d. Reduction of effluent contamination

   2) Means for production increase (Unit 1)

      a. To improve the daily production, increasing the machine speed (30 to 50%) and raising the total efficiency (68% to 76%)

      b. Thus an additional production of 1,378t is expected per year.

   3) Means concerning the sales increase and the selling price improvement (Unit 1 and 2)

      (1) Unit 1
         a. Selling price restoration by quality improvement (3%)
         b. To change in part non-profitable grades to profitable grades

(2) Unit 2

To reduce the production ratio of common grade cigarette paper and to increase the production ratio of higher grade cigarette paper.

4) Means of improvement on management technique and operation technique

Education and training of a total of 28 man-month

5) Total funds required

Rp 7,982,608,000 (5,026,087,000 of foreign currency included)

6) Period of time required for the renovation work

26 months

7) Total number of employees

Unchanged

3. Market

Sales expansion products to be expected are those to repalce the papers now imported and the export of an increased portion of straw pulp.

So, the expanded sales can be performed without disturbing the market conditions of Indonesia. Moreover, such sales contribute to a saving of foreign currency.

4. Raw Materials for Self-made Pulp

To be collectable from the suburbs of the plant.

5. In case the best available plant is carried out

1) The I.R.R.O.I. after tax is 13.80%

The pay-out period is 5.1 years.

2) After-tax profits Rp 353,550,000 in 1983 (Actual)
Rp 1,051,002,000 after 1990

3) During all the period of realization of the plan there is no fund shortage. The repayment of long-term loans is possible and a sound financial condition can be maintained.

6. From the above-mentioned study result the renovation plan is feasible.

We recommend that the plan be put into practice as early as possible.

7. To carry out this renovation plan successfully, the following matters are recommended:

1) The stabilized and improved quality of products and the reduction of production cost are fundamental needs for any enterprise to survive.

In this report defective points on operation, management and installation and countermeasure to be taken for the improvement were indicated wherever needful.

Since there are many indications which can be carried out immediately, it is recommended that the quality improvement and the profit improvement be achieved by making use of our advices, putting them into practice to start from whichever accessible.

2) To attain the goal of this plan the improvement of hardware as well as software is very important, the two phases being inseparable as if both wheels of a vehicle. A good balance between the hardware and software should be kept.

3) In order to carry out this plan smoothly, it is considered to be a good means to receive the guidance of foreign consultants and the engineers of foreign paper mills with long experience.

Chapter 1.

INTRODUCTION

Chapter 1. INTRODUCTION

1-1 Background and Circumstances of Investigation

(1) In developing countries, especially in the countries of ASEAN, many plants have been constructed with the economic cooperation of Japan, but as these facilities are getting old, the rate of operation is dropping and the cost is increasing in many cases.

Under such circumstances, requests for the cooperation of Japan to reactivate these plants are increasing, and on the occasion of visiting these countries in late April, 1983, the prime minister of Japan, Mr. Nakasone, made his intention clear to satisfy these requirements.

(2) Through the first to third 5-year development plans, (1969 to 1973), (1974 to 1978) and (1979 to 1983), the paper and pulp industries in Indonesia have been developed to the current scale (as of 1981) of 31 mills with a paper and paperboard production capacity of 370,000 tons a year, and a pulp production capacity of 75,000 tons a year. However, the industries still need protection.

The government of the Republic of Indonesia has decided, as the next step, to newly construct or expand some paper and pulp mills on a large scale, as well as to encourage the optimization and rational expansion of existing mills, thereby establishing a firm foundation for the pulp and paper industries to become export-oriented industries.

(3) With this as the background, the government of the Republic of Indonesia made a request to the government of Japan in December, 1983, for the implementation of technical cooperation for the plant (pulp and paper) renovation plan of three mills; Basuki Rachmat, Padalarang and Blabak out of the five pulp and paper mills owned by the Indonesian government.

(4) Upon receiving this request, the government of Japan consigned the implementation of investigation of two mills, Basuki Rachmat and Padalarang, out of the three mills, to the Japan International Cooperation Agency.

The Japan International Cooperation Agency dispatched a preliminary survey team, headed by Yukio Harada of the agency to the Republic of Indonesia for the period of December 21 to 28, 1983.

The team conducted a preliminary survey for the feasibility study of the project with the related offices of the Indonesian government as well as at the said two mills.

The preliminary survey team conferred in detail with the Directorate General of Basic Chemical Industries, Ministry of Industry, the counterpart of this project on the Indonesian side, with regard to the basic content of the investigation to be conducted by the main survey team, and on December 26, 1983, they both concluded and signed the document called "Scope of Work, for the Study on the Renovation of Basuki Rachmat Pulp and Paper Mill and of Padalarang Pulp and Paper Mill in the Republic of Indonesia" (hereinafter referred to as Scope of Work).

(5) This survey team is to implement the feasibility study of this project based on the Scope of Work.

1-2 Purpose of Investigation

The purpose of investigation by this survey team is to make a diagnosis of the Basuki Rachmat Pulp and Paper Mill and the Padalarang Pulp and Paper Mill and to study the feasibility of renovating these two mills from the technical, financial and economic viewpoints, as well as to prepare a renovation program to achieve a higher production efficiency and quality improvement of the products of these mills.

1-3 Scope of Investigation

(1) Mills to be investigated

Investigation of the renovation plans of the Basuki Rachmat Pulp and Paper Mill (hereinafter called as BRPP) and Padalarang Pulp and Paper Mill (hereinafter called as PPM) in the Republic of Indonesia.

(2) Products to be analyzed

The following products which are produced mainly for domestic consumption:

1) Current products of the two mills
2) Products that the two mills desire to produce in the future

(3) Scope of investigation

The following items as agreed upon in the Scope of Work:

1) Current situation and policies of the pulp and paper industries in Indonesia

2) Plant management and control system

   a. Operation and quality control
   b. Maintenance of machinery and auxiliary equipment
   c. Cost control
   d. Management organization
   e. Employee training

3) Technical investigation of mill machinery and equipment

   a. Pulp section
   b. Stock preparation section
   c. Paper making section
   d. Finishing section
   e. Chemical recovery section
   f. Utility section

4) Investigation of raw materials

5) Investigation of market demand in Indonesia
6) Preparation of renovation program

a. Renovation plan
b. Employee training and necessary investment
c. Execution plan

7) Financial analysis
8) Economic evaluation
9) Conclusion and recommendation

1-4 Implementation Method and Contents of Investigation

1-4-1 Basic Policy of Investigation Implementation

The background and purpose of this investigation are as described in the above.

The investigation was conducted based on the background and purpose and the agreement concluded between both governments, Indonesia and Japan.

In conducting the investigation, consideration was given to the fact that the two mills have contributed to regional development in Indonesia, (as well as noting the restrictions that accrue from the necessity of contributing to the regional development).

In addition, we intended to realize a technology transfer as much as possible even at the investigation stage, and to balance the assistance between aspects of software and hardware, and to accomplish this the survey team conducted the following:

1. Review of previously acquired data and investigation of new data

2. Sufficient exchange of opinions with the related parties in both governmental and industrial circles.

3. Close observation studies at the site

1-4-2 Implementation Method of Investigation

During the period of field investigation(Note 1), the survey team(Note 2) presented an initial report to the counterpart team of DGBCI(Note 3) on the Indonesian side, the cooperation team of BRPP(Note 4), and the cooperation team of PPM(Note 5) and discussed with them measures for executing this survey repeatedly and in detail.

At the same time, the survey team obtained various data from the Indonesian side and analyzed them.

The survey team spent time at both mills, during which the survey team conducted close observation, investigation, analysis and repeatedly conferred with the operation and management departments in addition to working closely with the cooperation teams of the two mills.

During this period, the survey team tried to realize as much technology transfer as possible. The survey team members in charge of marketing engaged in market research independently and with persons responsible for sales at these two mills, and their survey covered almost all major paper market in the Jawa island.

Towards the end of the field survey period, the survey team presented an intermediate survey report to DGBCI, BRPP and PPM, and discussed the field survey results with the Indonesian side in detail.

Minutes of these meetings were prepared and exchanged between both parties with respective signatures thereon.

(Note 1) The field investigation schedule is shown in Appendix 1.
(Note 2) The survey team members are listed in Appendix 2.
(Note 3) The members of the DGBCI counterpart team are listed in Appendix 3.
(Note 4) The members of the BRPP cooperation team are listed in Appendix 4.
(Note 5) The members of the PPM cooperation team are listed in Appendix 5.

1-4-3 Investigation Contents

The items that the survey team investigated to achieve the aforementationed goals and the range of the investigation are shown in the following broad classifications:

1) Current situation and policies of the paper and pulp industries in Indonesia

The survey team visited Directorate General of Basic Chemical Industries, Ministry of Industry (hereinafter called as DGBCI) and confirmed the national policies on the paper and pulp industries.

2) Investigation of plant management and control system

(1) Operation and quality control

a. The following data was reviewed:

– Data related to operations

Production plans, Production records, Monthly operation reports, etc.

– Data related to quality control

Test results on raw materials, intermediate products and final products, and others

– Data related to standards

Quality standards, Technical standards, etc.

b. The following items were investigated:

– Yield, unit consumption and efficiency at various production stages

– Testers

Maintenance and management of measuring equipment
Maintenance and management of measuring methods

c. The survey team observed the technical skills and abilities of employees.

d. The survey team observed how a sense of management is effected in daily work.

(2) Maintenance of machinery and auxiliary equipment

a. The survey team reviewed the following data and investigated how the data is kept as records:

– Machinery records, Preventive maintenance plans, Preventive maintenance records, Accident investigation records

– Status of performance of maintenance

– Status of storing spare parts

b. The survey team observed the technologies and skill of employees.

(3) Cost management

a. The survey team reviewed the following materials:

Budget tables, Statements of accounts, Tables related to costs, Tables of financial reports

b. The survey team investigated the earning status from the following materials:

Monthly and annual profit and loss figures, profitability by main grades manufactured, profitability by main sections.

c. The survey team observed the extent of cost consciousness of management and employees.

(4) Management organization

a. The survey team heard the explanation of management on basic policy, targets and measures being taken.

b. The survey team reviewed the current organization of the plant.

(5) Employee education and training

a. The survey team heard the explanation of management on the policy of employee education and training.

b. The survey team observed the technologies and technical level of employees.

c. The survey team observed employee morale.

3) Technical investigation of mill machinery and equipment

a. The survey team investigated the state of wear and tear of mill machinery and equipment.

b. The survey team investigated the performance of each machine and piece of equipment.

The relationship between performance and the following points was kept in consideration when conducting the performance investigation:

Quality, yield, unit consumption, efficiency, productivity, easiness of control and maintenance, environmental protection and safety.

c. The survey team reviewed the flow sheets.

d. The survey team investigated and studied expansion and improvement plans.

4) Investigation of raw materials

(1) Padalarang Pulp and Paper Mill

a. The survey team conducted a field survey on the Flax supply situation.

b. The survey team reviewed the data on straw.

(2) Basuki Rachmat Pulp and Paper Mill

a. The survey team reviewed the samples of bamboo, coniferous trees and broad leaved trees currently used.

5) Market research

(1) The survey team acquired data from DGBCI and Indonesian Paper and Pulp Association (hereinafter called as IPPA) on the supply-demand situation. The market prices and distribution channels were investigated mainly through existing sales organizations.

(2) The survey team visited the major consumers of the current products of the two mills and major consumers of the products within the scope of investigation, and investigated their evaluation of the quality and product prices of the two mills.

(3) The survey team checked the current situation through discussions with persons responsible for marketing in the two mills.

(4) The survey team obtained samples of competing products and examined them as comparison tests after returning to Japan.

6) Preparation of renovation program

The survey team prepared a renovation program, in line with the background and purpose of the investigation, based on the analysis results of the field survey, results of reviewing existing materials, and referencing the opinions of related parties in and outside of the country. The renovation program covers aspects of both hardware and software.

When preparing the renovation program, an environmental improvement of the mill sites was taken into consideration.

7) Financial analysis

(1) Investigation of manufacturing costs

The survey team calculated the raw material cost for each type of product from the quantities of raw materials, chemicals, utilities and operation materials necessary for production. The survey team also investigated personnel expenses, administration expenses, distribution expenses necessary for sales, such as transportation costs and warehouse charges, various taxes and interests.

(2) Financial analysis

The survey team prepared various tables based on the data obtained through the field investigation, by comparing the profit and loss calculation for the case of continuing the operation at it is with an estimated profit and loss calculation after implementing the renovation project. The difference in income between the two cases was regarded as the profit of this renovation project, and the internal rate of return (IRR) and the time required for the return on investment were calculated based on the estimated investment.

8) Economic evaluation

The economic evaluation is made qualitatively only. The survey team made no quantitative evaluation.

9) Conclusion and recommendations

The survey team studied the investigation results in terms of national policies, socio-economics, market situation, raw materials, manufacturing equipment and technologies, conducted financial and economic analysis and evaluation on individual subjects, and evaluated the results from an overall viewpoint.

Furthermore, the survey team pinpointed problems that are expected to occur in the course of implementation of this project and are making recommendations for countermeasures.

10) Items of special attention

(1) The survey team studies the economics of expansion plan based on the investigation results of the market, raw materials, technologies and equipment, and clarified how it would favorably affect the reactivation of the existing mills and improvement of the profitability of the mills.

(2) In the study of new products, the survey team reviewed profitability in comparison with that for the current products.

Particular care was paid to the study on the base paper for processing like NCR (copying paper) to the extent of making a good balance between existing paper-making machines and processing machines (coaters and others) that must be newly installed, in addition to investigating profitability and market situation.

(3) The survey team studied the necessity of technical cooperation and technology transfer to enable the two mills to cultivate software (ability to solve problems) so that they can adapt themselves to changes that might occur in the future.

(4) The survey team concurrently studied measures to be taken for environmental protection when considering expansion and improvement plans.

1-5 Words of Appreciation

During the investigation work, the survey team was given much in the way of cooperation, facilities and opinions by their counterparts to name Directorate General of Basic Chemical Industries, Ministry of Industry, the cooperation team of the Basuki Rachmat Pulp and Paper Mill and the cooperation team of the Padalarang Pulp and Paper Mill, public organizations like IPPA, Statistics Bureau, JETRO and others, and a large number of private enterprises. The survey team wishes to express sincere appreciation for such cooperation and support given by all of them.

Chapter 2.

PULP AND PAPER INDUSTRIES IN INDONESIA

Chapter 2. PULP AND PAPER INDUSTRIES IN INDONESIA

2-1 Outline of Pulp and Paper Industries in Indonesia:

The first paper mill was consturcted in 1922 in Padalarang by the Dutch Colonial Government. A small paper machine producing several tons a day started the production of bond paper, typewriting paper and writing paper used by the colonial government in 1924. The second paper machine in Padalarang started production in 1932. The second paper mill was established in Proporingo in 1939. This is the present LECES Mill.

Twenty-two years later, including the period of World War II, the BLABAK Mill was constructed in 1962, the GOWA Mill in 1967, and the BASKI RACHMAT Mill in 1969 by the Japanese reparations, etc., and these mills started the paper production in succession. These five mills are the government own paper mills having the integrated production facilities from pulp making to paper making. There had been no private paper mill until NOREE INDONESIA Co. constructed a mill in 1974.

During the period of 1975/6 to 1980, more than 30 private paper mills were constructed in the suburbs of large cities in the Jawa Island, and the production rapidly increased from the level of 50,000/60,000 tons a year to 374,000 tons a year in 1983. The production capacity in 1984 is estimated to reach 676,000 tons a year, making Indonesia the largest paper producing country in the five ASEAN countries.

On the other hand, while there are abundant fiber resources in Indonesia, 14 pulp mills are currently producing only 140,000 tons of pulp, and the insufficient domestic supply of pulp is one of the major problems for the paper industry in Indonesia.

The paper consumption per capita is extremely low, since the population is so large, the figure being only about 4 kg per capita, which is less than 3% of per capita consumption in Japan (146 kg in 1982).

The largest production item in Indonesia is printing /writing paper, which is followed by packaging paper such as liner, corrugating medium and white-lined board.

The largest import item is newsprint paper for which Indonesia has no production facilities, followed by wrapping paper and packaging paper. The importation of printing/writing paper is below 10,000 tons a year. Apparently, the production facilities increased and domestic production is increasing on the printing/writing paper, limiting the importation of this type paper to a relatively small quantity.

In recent years, the actual production of paper is not increasing proportionally to the increase of production capacity. The main reasons for this are that the domestically produced paper is not competitive with imported paper both in quality and prices and that many of these domestic mills are in the process of expansions and renovations.

2-2 Position of Pulp and Paper Industries in Indonesia:

According to DGBCI, the paper and pulp industries are designated as the most important industries in the country after the petroleum industries, positioning above the fertilizer and cement industries.

The fourth 5-year plan (1984 – 1988) schedules expansion of the LECES Mill up to 90,000 tons a year of newsprint paper and expansion of the CIRACAP Mill to have a capacity of 90,000 tons a year of kraft paper during the period.

The annual growth rate planned during the fourth 5-year plan is 18.53%. When this is compared with the national average growth rate of 5% projected with the breakdown of 17% for heavy chemical industries, 6.5% for light industries, and 3% for small industries, it is apparent that the Indonesian government is placing priority on the paper and pulp industries.

Being a process industry, the scale of employees in the pulp and paper indstries is small, but during the period of the fourth 5-year plan, employment of additional 5,200 persons over the present 12,000 persons is scheduled, bringing the total number of employees up to 17,200 persons.

Thus, the pulp and paper industries are one of the priority industries of Indonesia. The Indonesian government is encouraging optimization and rational expansion of the existing mills. Thus, the government is aiming at their growth to be competitive internationally so that the industries will be positioned as export-oriented type of industries.

At present, however, the Indonesian paper and pulp industries lack in the international competitive ability both in quality and prices to a considerable extent, and for sometime to come, the industries must be protected by means of holding a higher tariff barrier and so on.

2-3 General Policies on BRPP and PPM

Both of the Basuki Rachmat Pulp and Paper Mill (BRPP) and Padalarang Paper and Pulp Mill (PPM) are the pionner of the government owned paper mills. Their facilities are old when compared with other private mills and the two are handicapped on the geographical conditions and the availability of raw materials. Accordingly, we have confirmed that consideration should be given to the following points as measures to overcome these handicaps.

a. Optimization of production scale

b. Selection of production grades that are competitive in the market

c. Effective utilization of domestic raw materials and restriction on importation

d. Activation as regional industries and stabilization of employment

e. Conversion to export-oriented type of industry

f. Improvement to highly efficient facilities with an investment as small as possible

g. Conversion to production of energy-saving type

h. Upkeeping of old facilities with complete maintenance

i. Importance of education and training of the whole employees

PPM has a lincense of producing 6,000 tons of cigarette paper a year and BRPP has a license of producing 6,000 tons of specialty paper a year. Therefore, the market research and equipment studies must be conducted in detail for efficient production of these items.

Chapter 3.

MARKET

Chapter 3. MARKET

3-1 Policy of Market Research

We have used data obtained from public organizations such as the Ministry of Inudustry, Republic of Indonesia, Statistic Bureau and IPPA (Indonesian Pulp & Paper Association) as well as non-public organizations like paper dealers and users.

When there was a discrepancy on data of the same subject, we have revised it taking the actual situation into consideration. Such revision was particularly necessary when handling the data of current demand, for making demand forecast on specialty paper.

Our market research was conducted with a view to plan renovation of both mills, Baski Rachmat Pulp & Paper mill (hereinafter called as BRPP) and Padalarang Pulp & Paper Mill (hereinafter called as PPM), placing the importance on the following points:

(1) Collection of data to forecast the future demand based on the past and present situation of paper production, import/export and sales in the Republic of Indonesia.

(2) Particular emphasis was placed on investigation of supply and demand structure and market size of specialty paper, cigarette paper and printing/writing paper, all of which were very closely related with the products of the two mills.

(3) We have conducted the following investigation by conferring with the executive members of the two mills and by visiting users of their products accompanied by the mill management people:

   a. Investigation of sales activities

   b. Learning of sales policies

   c. Investigation of quality evaluation in the market

   d. Investigation of actual prices

   e. Effort to transfer the software related to sales

(4) Collection of materials to determine the promising grades for future production of the two mills.

(5) Investigation of conditions on competition between national and private enterprises and comparison of the management status from sales viewpoint.

3-2 Demand and Supply of Paper in Indonesia

The records of production and sales in 1982 and 1983 and forecast for 1984 as obtained from the INDONESIA BUSINESS NEWS (1983 edition) are described in this section.

3-2-1 Actual production in 1982 and 1983

The actual production in 1983 was 374,379 tons, which is an increase of 13.5% over the 1982 production (329,688 tons). The production capacity is 505,000 tons, so that the rate of operation was only 74%. The reasons for the lower rate of operation are (1) several mills were under remodeling or expansion work, (2) the market was soft and, (3) some grades were not competitive with imported ones quality wise.

The main reasons for the soft market are increased fuel price in January 1983 (RP 125/lit to RP 135/lit on heavy oil) and devaluation of the Rupiah in March 1983.

3-2-2 Export and Import in 1982 and 1983

Import	1982:	306,995 t	US$210,455,000 (@$685/t)
	1983:	267,105 t	US$183,206,000 (@$686/t)
Export	1982:	5,200 t	US$2,443,000 (@$470/t)
	1983:	10,706 t	US$5,790,000 (@$541/t)

The government determined to pay 15% of the check price as export subsidy starting from 1983.

3-2-3 Consumption in 1982 and 1983

1982: 631,483 t (4.20 kg per capita a year)
1983: 630,778 t (4.10 kg per capita a year)

Decrease of purchasing power, lower GDP (2 – 3%) and increase of the population are cited as the reasons for the decrease of consumption per capita.

3-2-4 Government plans for 1984

1) Production capacity

The capacity is aimed at 676,000 t, or 133.86% of the current capacity of 505,000 t in 1983. The projected increase is 171,000 t, out of which 110,000 t is on newsprint paper.

2) Consumption

106.22% of 630,778 t consumed in 1983, or 670,000 t.

3) Supply

As was in 1983, paper will be oversupplied in 1984. To overcome this problem, the government set the export target at 70,000 t. In order to achieve this goal, the government is taking measures of export subsidy, as well as guiding the paper mills to reduce various costs.

4) Import

Saving of foreign currency by about $30,000,000 by decreasing the import from 267,105 t in 1983 (@183,206,000, @$686/t) to 228,850 t ($153,000,000, @$669/t) in 1984.

The government plans to raise the rate of operation to 76% by saving on import.

3-2-5 Related governmental reference materials

Table 3-2-1 shows the actual production, import, export and consumption in 1976 through 1983 by grades.

The forecast of supply-demand by grades for 1983 through 1990 is shown in Table 3-2-2.

The new installation and expansion plans are shown in Table 3-2-3.

Table 3-2-1 Production, Import, Export and Consumption by Grades

(Unit: 1,000 t)

			1976	1977	1978	1979	1980	1981	1982	1983
Production	Cultural paper	Newsprint	–	–	–	–	–	–	–	–
		W/P	51,809	63,158	94,378	119,793	120,826	135,250	161,278	172,934
		Subtotal	51,809	63,158	94,378	119,793	120,826	135,250	161,278	172,934
	Industrial paper	Wrapping & packaging	4,101	23,500	39,279	60,467	63,699	73,222	101,734	111,049
		Boards	5,000	9,600	18,940	30,870	43,593	47,365	62,589	85,821
		Cigarette	1,115	1,900	2,006	2,385	2,640	2,410	3,209	3,095
		Subtotal	10,216	35,000	60,225	93,722	109,932	122,997	167,532	199,965
	Others		435	500	600	640	968	1,304	878	1,480
	Total		62,460	98,658	155,203	214,155	231,726	259,551	329,688	374,379
Import	Cultural paper	Newsprint	67,454	55,959	90,274	72,659	99,809	100,410	119,934	100,172
		W/P & business	54,675	32,122	28,670	23,686	15,262	14,550	12,062	9,939
		Others	1,870	2,353	2,023	2,208	3,969	5,182	5,440	5,766
		Subtotal	123,999	90,434	120,967	98,553	119,040	120,142	137,436	115,877
	Industrial paper	Wrapping & packaging	43,181	71,205	66,842	102,293	108,307	106,468	119,763	97,918
		Boards	62,480	43,582	27,390	27,524	32,904	25,169	25,456	28,406
		Cigarette	6,010	8,564	8,116	7,132	8,762	6,480	7,178	7,139
		Others	4,584	3,908	4,529	6,748	10,598	14,591	10,451	11,150
		Subtotal	116,255	127,259	106,877	143,697	160,571	152,708	162,848	144,613
Export	Others		2,987	11,162	9,200	10,375	7,848	7,024	6,721	6,615
	Total		243,241	228,855	237,044	252,625	287,459	279,874	307,005	267,105
Consumption		W/P	–	–	–	6,507	6,891	4	1,387	7,070
		Wrapping & packaging	–	–	–	–	55	1,144	3,813	3,636
		Newsprint	69,454	55,959	90,274	72,659	99,809	100,410	119,934	100,172
		W/P & business	106,484	95,280	123,049	136,972	129,197	149,796	171,953	175,503
		Other cultural paper	1,870	2,353	2,023	2,208	3,969	5,182	5,440	5,766
		Wrapping & packaging	47,282	94,705	106,121	162,760	171,951	178,546	217,684	205,761
		Boards	67,480	53,182	46,330	58,394	76,497	72,534	88,045	113,797
		Cigarette	7,125	10,464	10,122	9,517	11,402	8,890	10,387	10,235
		Industrial board	4,584	3,908	4,529	6,748	10,598	14,591	10,451	11,150
		Others	3,422	11,662	9,800	11,015	8,816	8,328	7,599	8,095
	Total		305,701	327,513	392,247	514,213	512,239	538,277	631,493	630,718

Table 3-2-2 Supply-Demand Forecast (1983 – 1990)

Supply Forecast

(Unit: 1,000 t)

		1983	1984	1985	1986	1987	1988	1989	1990
Cultural paper	Newsprint	–	–	76.5	76.5	76.5	81	85.5	90
	W/P	179	246	257	311	378	395	406	406
	Subtotal	179	246	333.5	387.5	454.5	476	491.5	496
Industrial paper	Sack kraft	–	–	76	150	246	258	270	283
	Kraft liner	56	77	123	132	275	284	293	293
	Fluting medium	89	90	104	113	124	116	119	119
	Boards	102	128	131	151	156	157	161	233
	Sub total	247	295	434	546	791	815	843	928
Others	Cigarette	2.9	5	10.6	10.6	10.6	10.6	10.6	10.6
	Tissue	1.8	15	14	14	14	14.5	15	16
	Others								
	Sub total	4.7	19	24.6	24.6	24.6	25.1	25.6	26.6
Total		430.7	560	792	958	1,270	1,316	1,360	1,450.6

Demand Forecast

		1983	1984	1985	1986	1987	1988	1989	1990
Cultural paper	Newsprint	100	107	115	123	131	140	149	160
	W/P	183	200	220	236	255	276	299	325
	Sub total	283	307	355	349	356	416	448	485
Industrial paper	Sack kraft	52	59	66	74	82	91	102	115
	Kraft liner	82	93	105	116	130	145	162	182
	Fluting medium	68	77	85	95	109	122	141	159
	Boards	94	105	122	134	146	163	176	199
	Sub total	296	334	377	419	467	521	581	655
Others	Cigarette Tissue Others	60	68	78	86	96	107	120	130
	Sub total	60	68	78	86	96	107	120	130
Total		639	709	790	864	949	1,044	1,140	1,270

Table 3-2-3 Development of Pulp and Paper Industry in Indonesia

	Name of Mills	Start of Production	Production Capa. (TPY)	Kind of Product
I	EXPANSION PROGRAM			
	1. UNDER CONSTRUCTION			
	PT. INPAMA	1984	3,000	Tissue paper
	PT. PAKERIN	In stages–1984–1986	51,600	Coated paper, N.C.R., Wrapping, Kraft liner, Duplexboard coated
	PT. KERTAS LECES	Stage III–1983	76,000	Writing & Printing, Wrapping and Tissue paper
		Stage IV–1986	90,000	Newsprint paper
	PT. PELITA CENGKARENG	1985	10,500	Kraft liner
	PT. PINDO DELI	1984	6,000	Board
	PT. CIWI KIMIA	In Stages–1984–1987	147,600	Coated, N.C.R., Computer, Fine paper for laminated, Kraft liner, Lining paper, Duplex board, Paperboard-coated with asphalt
	2. PLANNED			
	PT. ASIA PASIFIC AGUNG CORPORATION		15,000	Kraft liner, Corrugating medium and Board
	PT. KERTAS BASUKI RACHMAT		6,000	Specialty thin paper
	PN. KERTAS PADALARANG		6,000	Cigarette paper
	PT. INDA KIAT		18,000	Writing and Printing paper
	PT. NOREE INDONESIA PAPER		2,500	Duplex board
II	NEW PROJECTS			
	1. UNDER CONSTRUCTION			
	PT. BERKAT AGUNG INDAH (Market pulp)	1984	100,000	Bleached Pulp (LBKP)
	2. PLANNED			
	PT. KERTAS KRAFT ACEH (Integrated)		175,000	Sack kraft and Kraft liner
	PT. KERTAS KRAFT CILACAP (Integrated)		90,000	Sack kraft paper
	PT. FAJAR ANSANA UTAMA		60,000	Kraft liner and Sack kraft paper
	PT. HARAPAN TUNGGAL JAYA (Integrated)		150,000	Paper and 100,000 Pulp
	PT. INDUSTRI DEOKO		15,000	Kraft liner and Corrugating medium
	PT. INCON CAHAYA SEMESTA		15,000	Sack kraft paper
	PT. ISARIN MANUNGGAL		51,000	Abbrasive, White board
	PT. KERTAS BARITO (Integrated)		150,000	Paper and 100,000 Market pulp
	PT. KERTAS JATILUHUR		3,500	Cigarette paper
	PT. KERTAS KALBAR KESUMA		15,500	Paper board
	PT. KERTAS MERPATI		15,000	Writing and Printing paper
	PT. KERTAS MUSI RAYA INDUSTRY		30,000	Paper board
	PT. KING PAPER MILL		12,432	Writing & Printing, Kraft liner and Corrugating medium
	PT. SURYA ARJUNA JAYA		24,000	Sack kraft paper
	PT. UNIQUE PANCA MURNI		9,800	Corrugating medium and Kraft liner
	PT. ASPEK		66,000	Newsprint paper
	PT. SARIDA PERKASA		66,000	Cigarette paper, Dipping paper

Table 3-2-4 Statistics of Imported Pulp and Waste Paper

1975 – 1980 (Jan. – Sep.)

(Unit: kg)

	1975	1976	1977	1978	1979	1980
1. Mechanical wood pulp	3,302,439	13,534,355	17,822,716	30,282,726	17,045,551	39,186,201
2. Soda wood pulp unbleached	174,331	448,912	5,375,858	12,204,980	8,869,771	7,856,823
3. Sulphite wood pulp	650,412	295,962	911,321	313,950	1,683,648	1,099,088
4. Chemical wood pulp dissolving grades	1,117,923	733,540	2,028,406	29,701,100	48,451,598	50,939,21
5. Soda wood pulp bleached	100,000	1,499,288	11,168,080	26,206,467	15,663,197	19,200,92
6. Sulphite wood pulp bleached	3,355,739	2,211,928	3,052,014	3,310,247	2,381,781	1,843,515
7. Semi-chemical wood pulp	10,250,454	499,573	100,000	198,947	300,000	–
8. Other pulp	310,555	634,527	2,976,734	9,602,129	14,312,091	17,509,318
Total, imported pulp	19,261,853	19,898,085	43,435,129	110,820,526	108,507,637	137,635,079
9. Waste paper etc. for remanufacturing	120,025	–	350,000	6,534,418	5,054,276	10,826,834
10. Other waste paper	13,315,147	12,156,685	15,215,904	13,077,622	7,413,147	830,945
Total, Imported Waste Paper	13,435,172	12,156,685	15,565,904	19,612,040	12,467,423	11,655

1981 – 1983

(Unit: kg)

	1981	1982	1983
1. Mechanical wood pulp	24,006,006	35,009,731	38,306,457
2. Chemical wood pulp dissolving grades in grades	18,485,162	19,202,425	8,758,326
3. Chemical wood pulp soda or sulphate unbleached	8,057,557	13,242,295	23,770,458
4. Chemical wood pulp soda or sulphate bleached/semi-bleached	60,122,808	62,485,084	144,470,363
5. Chemical wood pulp sulphite unbleached	494,915	1,105,292	526,742
6. Chemical wood pulp sulphite bleached or or semi-bleached	22,721,006	33,683,818	60,414,209
7. Semi-chemical wood pulp	2,303,892	1,833,278	5,190,296
8. Other pulp from any fibrous veg. mat.	18,980,268	33,236,926	58,511,675
Total, imported pulp	155,171,884	199,798,849	339,948,526
9. Other waste paper and paperboard for remanufacturing	8,659,481	10,337,203	17,459,530
10. Other waste paper and paperboard	–	–	270,840
Total, Imported Waste Paper	8,659,481	10,337,203	17,730,370

The actual import records of pulp and waste paper in 1975 through 1983 are shown in Table 3-2-4.

3-3 Estimation of Demand by Grades

A macroscopic view on the supply-demand situation is described in 3-2 based on data obtained from the governmental organizations. However, the data used in 3-2 does not show the actual picture in reviewing the grades that are closely related with BRPP and PPM on the following points:

(a) The classification of paper is not clear and even secondary processed goods are included in the paper category.

(b) As the habit of tax payers in Indonesia, all of the manufacturers, agents and dealers of paper are apt to report the sales at a lower level.

(c) A considerable part of paper on which the import duty is low, for example, about 30% of newsprint paper, is being used for other purposes like wrapping paper, cigarette paper and book paper. Special type of thin paper is being imported as lightweight grade of wood-free paper. Therefore, the classification of specialty paper is not clear.

(d) We have checked the statistics of paper exported from Japan to Indonesia, and we found large discrepancies on the export clearance figures in Japan and import clearance figures in Indonesia. This is another reason for us to say that the classification of specialty paper is not clear.

In consideration of these points, in this clause we estimate the demand of specialty paper based on the investigation result conducted mainly on specialty paper.

In other words, on the demand for 1983 through 1984, we prepared Table 3-3-1 based on the hearing from paper trading firms and dealers in Jakarta and Surabaya.

3-3-1 Basis for demand estimation

1) Fourth 5-year plan

Since we were unable to find out the demand growth rate by paper grades concretely in the 5-year plan, we set the JETRO Survey figures of 5% stated as the GDP growth rate in Indonesia and 9% as the growth rate of manufacturing industries as the basic growth rates.

2) Configuration and change of paper demand

a. The growth rate for general industrial paper is set at the same rate as that of manufacturing industries.

As for cultural papers, it seems that light and soft wrapping papers, such as, glassine papers, cellophane, manifold and grease proof paper are rapidly being replaced by plastic film and their share will decrease.

b. Since it is said that the number of people who smoke increases by about 7% a year (hearing from management people of a large tobacco manufacturer), we estimate that the cigarette paper demand would increase by about 7%. The configuration rate between bobbin (mechanical rolling) paper and sheet (manual rolling) paper would be changing more toward the mechanical rolling.

c. The Newsprint and writing/printing paper seem to grow at the same rate as the GDP growth rate. If the compulsory education system is completely realized from September 1984, the number of school children will increase year by year, and it can be expected that the growth rate would be greater towards the latter part of the 5-year plan than the current forecast.

Table 3-3-1 Forecast of Demand for Paper (1984 – 1990)

Unit: ton

Kinds	1983	Growth Rate	1984	1985	1986	1987	1988	1989	1990
Glassine Paper	1,700	0 %	1,700	1,700	1,700	1,700	1,700	1,700	1,700
Greased-proof Paper	1,200	1	1,212	1,224	1,236	1,248	1,260	1,273	1,700
Carbon Base Paper	2,000	2	2,040	2,080	2,120	2,160	2,203	2,247	2,292
N.C.R.	2,400	5	2,520	2,646	2,778	2,917	3,063	3,216	3,377
Base Paper for Lamination	2,000	9.5	2,190	2,398	2,626	2,875	3,148	3,448	3,776
Manifold	7,500	5	7,875	8,269	8,682	9,116	9,572	10,051	10,554
Ribbed Kraft Paper	7,500	9.5	8,213	8,993	9,846	10,782	11,807	12,928	14,156
Onion Skin	150	2	153	156	160	162	165	169	172
Soap Wrapper	1,500	5	1,575	1,654	1,736	1,823	1,914	2,010	2,111
Tracing Paper	100	9.5	110	120	131	144	157	172	188
Cigarette Paper	15,000	7	16,050	17,174	18,376	19,662	21,038	22,511	24,086
Computer Paper	3,600	20	4,320	5,184	6,221	7,465	8,958	10,750	12,900
Transfer Paper	240	2	245	250	255	260	265	270	275
W/P Pap. (incl. coated paper)	160,000	5	168,000	176,400	185,220	194,481	204,205	214,415	225,136
Newsprint	120,000	5	126,000	132,300	138,915	145,860	153,154	160,811	168,852
Kraft Liner Corrugating medium	250,000	9.5	273,750	299,976	328,233	359,415	393,560	430,945	471,885
White Board	105,000	9.5	114,975	125,898	137,858	150,954	165,295	180,998	198,193
Sack Kraft	45,000	5	47,250	49,613	52,093	54,698	57,433	60,304	63,319
Total	724,890		778,178	836,035	898,185	965,722	1,038,897	1,118,218	1,204,258
Population (estimation): mil.	158.1		161.6	165.2	168.7	172.2	175.6	179.1	182.7
Consumption per capita	4.6		4.8	5.1	5.3	5.6	5.9	6.2	6.6
IPPA'S ANNOUNCEMENT	630,778		709,000	790,000	864,000	949,000	1,140,000	1,270,000	–
Consumption per capita	4.0		4.4	4.8	5.1	5.5	6.5	7.1	–

d. Automation of office work is proceeding on a world scale and Indonesia is no exception. The propagation of computer use will expand more than it looks on the surface, and for this reason, we estimated an annual growth rate of about 20% for the form paper and computer paper.

e. It looks that carbon base paper will be gradually replaced by non-carbon paper (NCR) and the stencil paper by ordinary paper (PPC). The share of specialty paper in this field will decrease, but we estimate that the absolute quantity will remain unchanged.

f. Thus, this clause describes the demand estimate mainly on specialty paper. On industrial paper like containerboard and white board, we estimate a 9.5% growth, taking the average growth rate of manufacturing industries.

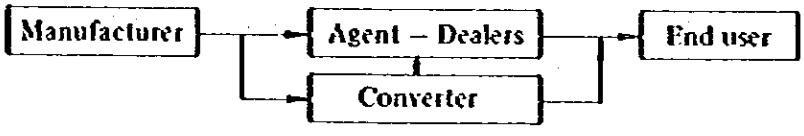
Reference: GDP growth rate

First 5-year plan (1969 – 1974)		7.7% (Actual)
Second 5-year plan (1975 – 1979)		6.9% (Actual)
Third 5-year plan,	1980	9.9% (Actual)
	1981	7.9% (Actual)
	1982	2.25% (Actual)
	1983	2.25% (Actual)
Fourth 5-year plan (1984 – 1989)		5% (Forecast) of which 9.5% is for manufacturing industries

3-4 Sales Activities

3-4-1 Distribution

1) The distribution system of paper in Indonesia is an shown in the chart below, and it is not much different from that of Japan.



The actual power of distribution is in the hands of Chinese merchants. The information network of Chinese merchants is so developed that it is said even large foreign trading firms cannot compete. The Chinese merchants are said to have an information network that enables them to control the prices constantly while watching the balance of production and inventory covering the domestic product and imported paper.

If the governmental enterprises are to enter the general market on a real scale, sales policies must be established based on thorough recognition of this situation. Through the market research conducted this time, we really felt that the governmental enterprises are very weak in sales activities. Training and recruitment of competent salesmen are extremely important.

2) In reflection of the soft market, manufacturers have been placed in an inadvantageous position recently on the payment. A 30-day promissory note was a conventional payment form, but recently, the term is becoming longer to 60 days, 70 days, 70 days or even as long as 90 days. Manufacturers are handicapped on the money flow.

3) Paper dealers are operating mainly in Jakarta and Surabaya, and Semarang.

Table 3-4-1 shows major paper dealers in Indonesia.

The scale of these dealers is rather small. Most of them handle 200 to 400 t of paper a month, having 10 to 30 employees. Some paper dealers have bases in Singapore and Malaysia, and they constantly travel these areas for information gathering and sales activities.

4) Generally, needless to speak of salesmen in the agencies of Chinese paper manufacturers, salesmen of the manufacturers are making sincere efforts and conducting energetic sales activities. National enterprises must learn much from these private enterprises.

3-4-2 Supply-demand and Mill Location

It is assumed that 80 to 90% of the paper consumption is on Jawa island, and especially, the ratio of processing and consumption is high in Jakarta, Surabaya, Semarang, Malang, Kudus and Yagyakarta.

Thin papers can only be processed by qualified converters located in large cities, and essentially, processing and consumption of thin papers are conducted in the said large cities almost entirely.

In most cases, private paper enterprises have the mills in places that are close to large consumption areas when compared with government own paper mills, and they are at an advantageous positions in all aspects of production cost, sales expenses, information collection and exchange.

Map 1 shows the paper and pulp mills on Japa island.

3-4-3 Major Consumption areas and Consumption Per Capita

The estimated paper consumption per capita in 1984 is 4.3 to 4.4 kg and perhaps 6.6 to 7.5 kg in 1990.

The estimated population is 161 to 162 million at present, out of which the population in urban districts is about 24%. The population of ten large cities accounts for 10.4% of the whole population.

The estimated paper consumption in urban districts is about 90% of the whole consumption and that in ten large cities is estimated to be about 60%.

Accordingly, the estimated annual paper consumption per capita in ten large cities is about 28 kg, which is still below the consumption of Malaysia in 1981 (32kg) or Singapore (67kg).

The population statistics are given in Table 3-4-2.

Table 3-4-1 (a) List of Indonesian Dealers in Paper Mill (Representatives Included)

Surya CV	Jl. Perniagaan 5	JAKARTA
Mas Djawa (Jawa) PT	Jl. Perniagaan 13	JAKARTA
Surya Kertas Jkt	Jl. Perniagaan 16	JAKARTA
Pantja Warna PD	Jl. Perniagaan 28	JAKARTA
Nasional PD	Jl. Perniagaan 44	JAKARTA
Raksa PT Lte.	Jl. Perniagaan Timur 11A	JAKARTA
Khioe Chiang Ho Firma	Jl. Perniagaan Timur 56	JAKARTA
Sutio Jaya	Jl. Perniagaan Timur 50	JAKARTA
Kresna Nurani	Jl. Toko Tiga 12	JAKARTA
Masa Semil	Jl. Toko Tiga 57B	JAKARTA
Sion Trading Co. CV	Jl. Toko Tiga 74	JAKARTA
Sam Looking & Co. NV	Jl. Toko Tiga 80	JAKARTA
Sinar Abadi PD	Jl. Pintu Besar Selatan 1/8	JAKARTA
CV Pelita	Jl. Pintu Besar Selatan 85 atas	JAKARTA
Pelita Cengkareng	Jl. Pintu Besar Selatan 89/91	JAKARTA
Wara Djaya Trading Co.	Jl. Pinangsia 73	JAKARTA
Noree Indonesia Paper	Jl. Pinangsia 83	JAKARTA
Surya CV	Jl. Pinangsia Timur 48	JAKARTA
Impama	Jl. Tiang Bendera 73 ii	JAKARTA
Cinjoe Jaya PD	Jl. Pejagalan Raya 83 A	JAKARTA
PT Tjiwi Kimia	Jl. Kalibesar Barat 8	JAKARTA
Karya Nusantara	Jl. Veteran III/9	JAKARTA
Papyrus Djaya PT	Jl. Ceylon 36	JAKARTA
Tri Tunggal Utawa PT	Jl. Biak 8	JAKARTA

Table 3-4-1 (b) List of Distributor/Agents

	Name	Address
EAST JAWA		
1.	UD. Nasional	– Jln. Panggung No. 26, Surabaya
2.	UD. Bima	– Jln. Karet No. 79, Surabaya
3.	PT. Tjipta Niaga	– Jln. Rajawali No. 54, Surabaya
4.	UD. Aneka Baru Kertas	– Jln. Perak Barat No. 91, Surabaya
5.	PT. Sali Sugih	– Jln. Rungkut Industri III/33A, Surabaya
6.	UD. Nusantara	– Jln. Kenjean No. 434, Surabaya
7.	UD. Aneka Kertas	– Jln. Karet No. 100, Surabaya
8.	Toko Interjaya	– Jln. Kartini No. 2, Denpasar, Bali
CENTRAL JAWA		
1.	PT. Sumber Jabaru Sakti	– Jln. Mt. Haryono No. 104, Semarang
2.	PT. Sarana Mas	– Jln. Sorogenen No. 55, Solo
3.	PT. Margono Dian Graha	– Jln. Petudungan No. 27, Semarang
4.	Toko Jaya Baru	
WEST JAVA/JAKARTA		
1.	PT. Pelita Satwika Sakti	– Jln. P. Jayakarta No. 44, Jakarta
2.	PD. Nasional	– Jln. Perniagaan No. 46, Jakarta

Table 3-4-2 Regional Distribution of Population

1980 – 1980: Population census

1983 – 1988: National Development Planning Agency, 1984

Unit: million

District	1980	1983	1984	1985	1986	1987	1988
Jawa	93.6	96.9	98.8 (61.1%)	100.7	102.5	104.4	106.0
Sumatera	25.8	31.0	31.9 (19.8%)	33.0	34.0	35.0	36.0
Kalimantan	6.3	7.4	7.6 (4.3%)	7.8	8.0	8.2	8.4
Sulawesi	10.5	11.1	11.3 (7.0%)	11.6	11.8	12.0	12.3
Bali & Nusatengara		8.9	9.1 (5.6%)	9.2	9.4	9.6	9.8
Irianjaya		2.8	2.9 (1.8%)	2.9	3.0	3.0	3.1
Total	146.8	158.1	161.6 (100%)	165.2	168.7	172.2	175.6

162.2 (UN: Population of the World)

Growth of Population

Jawa: 1.8%, Sumatera: 3.0%, Kalimantan: 2.5%

Sulawesi: 1.7%, Bali & Nusatengura: 1.9%, Irianjaya: 2.0%

Average: 2.0%, Of which 1983 – 1988; Urban 5.0% Rural: 1.1%

Urban . . . 1983 37.9 mil. (24%), 1988 48.4 mil. (28%)

Rural . . . 1983 120.2 mil. (76%), 1988 127.2 mil. (72%)

10 Big City's Population

Jakarta	6,481
Surabaya	2,018
Bandung	1,461
Medang	1,374
Semalang	1,025
Palenban	787
Ujung Pandang	708
Malang	511
Solo	470
Yagyakarta	398
Total	15,233

1980: Population census
Unit: 1,000

3-4-4 Sales organization and training of salesmen

1) We cannot help but say that government-owned paper mills are less active than private paper mills in the sales, and government own paper mills must rearrange the sales organization and train their salesmen so as to strengthen the sales force. If the sales force cannot be strengthened, government-owned paper mills will not be able to increase the sales quantity and earn more profit, even if they could produce higher quality paper.

2) The top management must review the existing sales system, strengthen the system and train the current salesmen. The sales activities of management level as done at present are limited since they are extremely busy.

3) We recommend that competent salesmen be stationed in major consuming areas and they call on major customers and paper dealers periodically, at least once a week, or preferably twice a week, to gather information, try to expand the sales, and handle all complaints. Both mills have a liaison office in Jakarta and Surabaya, but BRPP Surabaya office only is engaging in activities that might be called sales activities.

4) Emphasis is placed on the following points in order to stimulate the sales activities.

a. Establishment of appropriate sales system, clarification of responsibility, and transfer of competence.

b. Pursuance of the concept of "being in the market" by the production people as well, which is a basic point of total quality control activities.

c. Stabilization of the product quality, enabling the salesmen to engage in the positive sales activities for expanded sales without being occupied in office work only.

5) The quality and training of salesmen are most important. Salesmen must have the abilities of at least mastering the following knowledge, and must organically combine the knowledge and efficiently use it as needed.

a. Merits and demerits of own and competitor's products.

b. Cost of own products and estimated cost of competitors' products

c. Method of price setting (estimation)

d. Prompt response to complaints

e. Correct understanding of customers' requirements and preference

f. Understanding of business and procurement policies of customers

g. Advertising of own mill

6) Recruitment of competent salsmen is extremely important. It takes five to seven years to train professional salesmen. Therefore, employment of experienced salesmen, picking them up from private enterprises, should be an idea.

7) Under this renovation project, we plan giving training to selected qualified persons at the management level for three months by foreign instructors during the first stage of training and education.

Table 3-4-3 Each Firm's Paper Production & Productivity

Name of Company	Start of Production	Type of Product	Production Capa./1980	1979	1980	1983	Man Power 1980	Efficiency 1980 t/man/year
Basuki Rachmat	1969	Writing & Printing	13,800	12,511	12,857	11,308	770	16.7
Gowa	1967	Writing & Printing, Coated Paper	20,000	20,845	20,791	9,691	930	22.4
Padalarang	1923	Writing & Printing, Cigarette Paper Carton & Manifold	5,900	6,151	6,733	6,431	743	9.1
Blabak	1962	HVO, HVS, Stencil, Brief Card, Manila Carton Wrapping	7,200	6,923	7,958	7,236	548	14.5
Leces	1940	HVO (60 – 70g), HVS (50 – 60g), Cyclostyle/Duplicator, Drawing Paper,	30,000	30,279	27,553	24,298	649	42.5
Delitua Delta	1978	HVO, HVS & Cigarette Paper	1,200	1,000	–	–	126	7.9
Inpama	1976	Tissue, Toilet Paper & Napkins	1,500	664	958	889	101	9.5
Noree Indonesia	1975	Duplex Board & Straw Board	10,000	7,270	7,769	7,125	404	19.2
Bekasi Teguh	1976	Kraft Liner, Corrugated Medium, Soak Kraft, Wrapping Paper	33,000	29,925	30,350	74,743	614	49.4
Saraswati Bhakti	1977	HVO, HVS, BPS, Coated Paper	14,000	–	12,000	14,080	388	30.9
Suruya Agung Kertas	1976	Writing & Printing, Duplex Card Board	23,000	15,600	16,000	9,695	310	51.6
Pindo Deli	1978	HVO, HVS, BPS, Manifold, Coated Paper	7,800	3,010	3,305	11,904	176	18.8
Lontar Papyrus	1977	HVO, HVS, BPS, Manifold	7,500	4,445	4,330	1,124	135	32.1
Asia Pacific Agung	1974	Corrgating/Flute, Medium, Wrapping Paper	3,000	2,140	1,241	–	108	11.5
Pelita Cong Kareng	1977	Coated & Uncoated Board	19,500	1,600	7,500	–	–	–
Pura Kertas	1978	Coated & Uncoated Board, Kraft Liner	5,000	3,500	3,950	154	–	–
Eureka Aba	1978	Corrugating/Flute, Medium, Wrapping Paper	9,000	3,548	2,255	6,015	172	13.1
Papyrus Sakti	1978	Brief Card, Manila Carton, Wrapping Paper, Kraft Liner	5,400	900	3,000	3,975	–	–
Sinar Kudus	–	Wrapping/Flute, Corrugating	1,500	1,520	1,520	–	71	21.4
Uninga	1978	Wrapping Paper, Kraft Liner	3,040	1,282	–	–	75	–
Ciwi Kimia	1978	HVS, HVO	12,000	3,000	10,000	9,295	579	17.3
Pakerin	1977	Straw & White Board, Wrapping Paper	24,000	12,000	12,445	13,653	71	175.3
Indah Kiat	1979	HVS, HVO, BPS	33,000	16,428	27,509	45,683	234	117.6
Suparma	1978	Manifold, Kraft Liner, Kraft Paper, Ribbed Kraft	9,000	7,200	7,560	–	161	47.0
Karuya Tulada	1977	Wrapping, Kraft Paper	3,600	1,026	1,279	2,960	85	15.0
Unipa Daya	1978	HVS, HVO, BPS	16,740	–	2,800	5,060	–	–
Soear Sakti	1980	Duplex Board	9,000	–	–	–	–	–
Golden Martapura	1980	Kraft Liner, Writing/Printing	5,500	–	4,500	–	–	–
Sundaraya		Boards						
Jaya Kertas		W/P						
Meka Box		W/P						
Fajar Agsana		Sack Kraft						
Surya Anjuna		Sack Kraft						

3-5 Quality

(1) On almost all types of products, the quality is not up to the standard that is recognized internationally. Furthermore, the quality of paper that is produced by government-owned mills is much lower than the paper produced by private enterprises.

(2) The test results of samples from the two mills and samples from competitors' products, conducted in Japan, are shown in Tables 3-5-1 and 3-5-2 and Fig. 3-5-1. It must be noted that there are many users who wish to purchase a larger quantity should the quality of paper produced by the two mills be improved.

(3) The table below shows the evaluation results of users in Indonesia.

	No. 1 group	No. 2 group	No. 3 group
Writing/printing paper	CK, IK, PD	GW, BR	LC
Coated paper	PD	SK	GW
Boards	SK	SP	

CK: Ciwi Kima
IK: Indah Kiat
PD: Pindo Deli
SK: Surya Agung Kertas
BR: Baski Rachmat
GW: Gowa
SP: Suparma
LC: Leces

(4) Users prefer paper having a higher brightness. Brightness of white paper that is liked is obtained by processing with a fluorescent dye rather than brightness obtained as a result of using white pulp. Although the worldwide trend is toward restricting the use of fluorescent dyes for health reason, but no restriction is enforced in Indonesia.

(5) It must be noted that important elements of the quality are processability, printability, control of static electricity and finished state (packing material, packing form, state of cut sections, existence of paper dust on the sheet, etc.).

Table 3-5-1 Printing Paper Quality Test Results

Item \ Sample		BRPP Writing paper 80 g/m²	BRPP P/W paper	Surya Kertas paper	Indah Kiat P/W paper 60 g/m²	Leces P/W paper 60 g/m²	Leces P/W paper	Ciwi Kimia P/W paper 60 g/m²	Ciwi Kimia P/W paper 80 g/m²
		Made on Mar. 3, '84	Made on Dec. 3, '83	–	Made on Jan. 2, '84	–	Made on Dec. 24, '84	–	–
Basis weight,	g/m²	80.7	69.6	44.1	60.7	60.0	50.7	52.0	83.4
Thickness,	mm	0.110	0.098	0.061	0.077	0.089	0.067	0.065	0.106
Density	g/m³	0.73	0.71	0.72	0.79	0.75	0.16	0.80	0.79
Brightness, front (Photo volt)	%	80.0	78.0	81.0	81.5	83.2	78.0	84.1	85.0
back	%	80.6	78.9	81.0	82.0	84.0	78.9	84.5	86.0
Opacity,	%	72.0	84.7	74.5	87.0	82.7	76.5	79.2	87.1
Smoothness, front (Bekk)	sec	37	22	44	57	40	40	95	46
back	sec	31	22	43	45	23	35	83	22
Shives and specks	mm²/100g	102	24.6	29.6	16.6	9.09	8.93	26.9	12.8
Tensile strength									
M.D.	kg	5.03	4.98	3.44	4.10	3.92	3.82	3.75	6.60
C.D.	kg	2.24	2.03	1.24	1.37	1.93	1.85	2.65	3.95
Elongation, M.D./C.D.		1.6/3.1	1.5/3.6	1.3/3.0	1.8/4.4	1.7/6.0	1.9/3.9	1.8/3.8	2.4/5.3
Breaking length									
M.D.	km	4.16	4.77	5.20	4.50	4.36	5.02	4.81	5.28
C.D.	km	1.85	1.91	1.87	1.53	2.14	2.43	3.40	3.16
Stiffness M.D.	cm³/100g	98.0	59.3	28.6	38.7	42.5	35.1	35.1	84.9
C.D.	cm³/100g	35.1	33.8	10.9	17.3	19.5	16.4	21.0	59.3
Air permeability	sec	52	64	63	65	12.5	13.0	6.2	22.3
Sizing	sec	32	23	8	4	15	6	11	31
Picking, front/back A		up to 2/ up to 2	2/2	2/2	2/2	2/2	3/2	3/3	3/2
Ash content	%	10.1	7.6	6.3	15.3	10.1	7.6	9.1	8.1
Moisture content	%	7.0	7.3	7.4	6.8	7.6	7.5	7.5	7.6

Table 3-5-2 Litho Paper Quality Test Results

Item \ Sample		BRPP Litho paper 70 g/m²	Indah Kiat Litho paper 70 g/m²	Leces 1 Litho paper 70 g/m²	Leces 2 Litho paper 70 g/m²	Saraswati Litho paper 70 g/m²
Basis weight	g/m²	69.5	75.2	81.8	71.4	70.6
Thickness	mm	0.147	0.200	0.131	0.118	0.144
Density	g/m³	0.47	0.38	0.61	0.61	0.49
Brightness, front	%	77.0	81.7	80.3	79.8	74.7
front back	%	75.2	82.4	80.4	78.2	73.9
Opacity	%	90.7	91.2	88.8	94.5	92.8
Smoothness, front	sec	6.0	8.5	8.5	11.0	5.5
back	sec	3.1	5.1	6.1	5.8	5.1
Shives and specks	mm²/kg	103	6.38	32.7	27.9	98.8
Tensile strength						
M.D.	kg	3.71	4.35	5.38	4.38	2.60
C.D.	kg	–	–	–	–	–
Elongation,						
M.D./C.D.	%	1.4/–	1.2/–	2.21/–	1.6/–	1.2/–
Breaking length,						
M.D.	km	3.56	3.86	4.38	4.09	2.46
C.D.	km	–	–	–	–	–
Air permeability	sec	9.8	11.0	6.4	4.5	6.0
Sizing	sec	1	14	3.6	0	7.1
Picking, front/back	A	up to 2/ up to 2	2/2	2/up to 2	up to 2/ up to 2	up to 2/ up to 2
Ash content	%	9.2	15.3	5.7	14.9	7.6
Moisture content	%	7.1	6.5	7.9	7.8	7.3

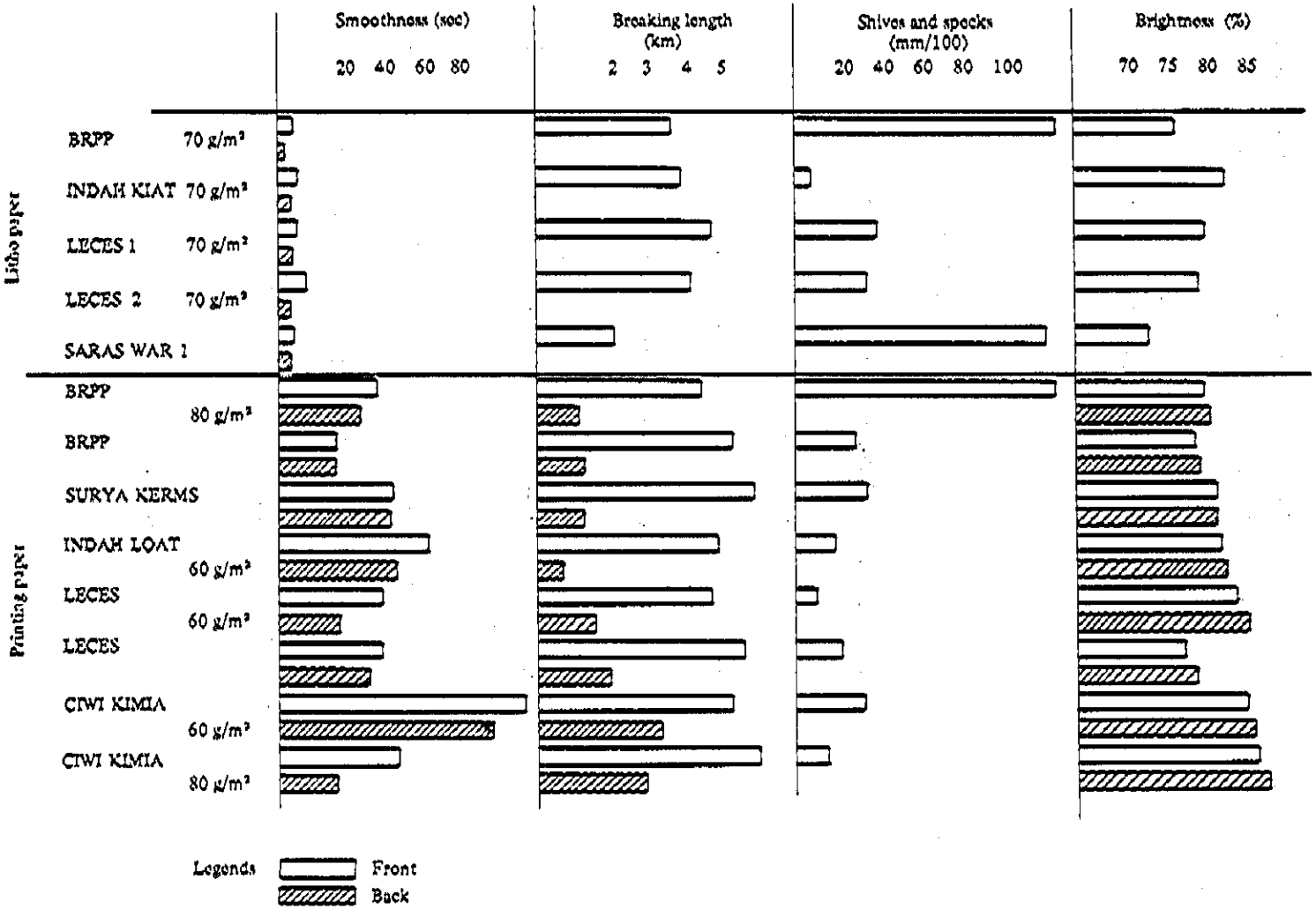


Fig. 3-5-1 Comparison of Test Results of Various Manufacturers' products

3-6 Prices

(1) In Indonesia, paper prices are quoted based on the imported paper prices. This is because imported paper occupies about 60% of the whole consumption and the quality of imported paper is good.

(2) Particular attention must be paid to the fact that the unit of sales is by ream (500 sheets) rather than kg.

Example: Cigarette paper

Import 24 g/m^2 : 508mm x 762mm = 0.387m^2/sheet, 4.645 kg/ream

Domestic products 26 g/m^2 : 510mm x 765mm = 0.390 m^2/sheet, 5.072 kg/ream

Domestically produced paper has the following losses:

Weight loss (basis weight loss) $(26 - 24) \div 24 \times 100 = 8.33\%$

Size loss $(0.390 - 0.387) \div 0.387 \times 100 = 0.78\%$

When domestically produced paper is sold at the same price per ream, slightly over 11% difference is created in the final yield, and this is a difference which cannot be disregarded from the manufacturing cost viewpoint.

(3) The treand of prices of major types is shown in Tables 3-6-1, 3-6-2 and 3-6-3. Paper made by government-owned mills is sold at about 10% lower prices than those of private mills since the quality is inferior and the sales ability is behind those of private jills.

(4) Price premium is applied for lighter substance (g/m^2) and for sheets as against rolls as a general ruk.

(5) An extra price is set separately for delivery to remote areas.

Table 3-6-1 Trend of Prices of Major Paper Products

Paper Type	Basis Weight	Size	April 1982		August 1982		August 1983		March 1984				
	g/m²	(cm)	RP/R	RP/kg	RP/R	RP/kg	RP/R	RP/kg	RP/R	RP/kg	Yen/kg		
Coated Paper Import	85	65 x 100	29,000	1,050	28,000	1,014	39,500	1,430	39,500	1,430	357.5	<27.6>	K. Liner 500 – 570 kp/kg
	85	79 x 109	36,000	984	35,000	956	47,500	1,298	48,500	1,325	331.0	<36.597>	
	100	65 x 100	34,000	1,049	33,500	1,031	43,000	1,323	43,500	1,338	335.0	<32.5>	Pulp LB KP $460 – $500 NB KP $475 – $500
	100	79 x 109	46,000	1,068	45,500	1,057	58,500	1,358	66,000	1,533	383.0	<43.055>	
	120	65 x 100	41,000	1,051	41,000	1,051	59,000	1,513	60,000	1,538	385.0	<39>	
	120	79 x 109	57,500	1,173	57,000	1,103	77,000	1,490	77,500	1,500	375.0	<51.666>	
Local	85	65 x 100	22,500	814	21,500	778	30,000	1,086	31,000	1,122	281.0	<27.625>	
	85	79 x 109	30,500	833	29,500	806	39,000	1,066	41,000	1,120	280.0	<36.597>	
	100	65 x 100	25,500	785	25,500	785	34,500	1,062	36,500	1,123	281.0	<32.5>	
	100	79 x 109	35,000	813	34,500	801	45,000	1,045	47,500	1,103	276.0	<43.055>	
	120	65 x 106	31,500	808	31,000	795	40,000	1,026	42,500	1,070	273.0	<39>	
	120	79 x 109	43,500	842	43,000	832	55,000	1,065	57,500	1,113	278.0	<51.666>	
Puplex Board	270	79 x 109	52,000	490	54,500	469	70,000	602	71,500	615	154.0	<116.249>	
	310	79 x 109	62,000	464	59,000	442	73,000	547	74,500	558	140.0	<133.471>	
	350	79 x 109	69,500	461	66,500	441	81,000	538	82,000	544	136.0	<150.623>	
	400	79 x 109	77,000	447	74,000	430	70,000	523	72,000	534	134.0	<172.222>	
Woodfree Paper	50	65 x 100	11,500	708	11,000	677	11,000	677	12,250	754	189.0	<16.25>	
	60	65 x 100	13,000	667	12,000	615	12,000	615	13,500	692	173.0	<19.5>	
	80	65 x 100	17,500	673	16,500	635	16,500	635	18,000	692	173.0	<26>	
	100	65 x 100	21,500	662	20,500	631	21,500	662	23,000	707	177.0	<32.5>	

Table 3-6-2 Woodfree paper prices

Basis weight g/m²	Size cm	Indah Kiat Dec. '83 Price Rp/ream	Indah Kiat Dec. '83 Price Rp/kg	Indah Kiat Mar. '84 Price Rp/kg	BRPP Mar. '84 Price Rp/kg
45	65 x 100	10,500	717.9	761 – 768	600
	63 x 97.5	10,100	730.8	775 – 782	
50	65 x 100	11,800	726.15	770 – 777	
	63 x 97.5	11,300	735.85	780 – 787	
	65 x 87	10,500	742.70	787 – 795	
	61 x 86	9,800	747.23	792 – 800	
58	65 x 100	12,600	668.45	708 – 715	
	63 x 97.5	12,000	673.65	714 – 720	
	65 x 87	11,100	676.85	717 – 724	
	61 x 86	10,400	683.60	724 – 731	
60	65 x 100	13,000	666.67	707 – 713	
	63 x 97.5	12,500	678.33	719 – 726	
	65 x 87	11,500	677.87	718 – 725	
	62 x 86	11,000	687.67	729 – 736	
	79 x 109	17,600	681.30	722 – 729	
70	65 x 100	15,200	668.13	708 – 715	
80	65 x 100	17,300	665.38	705 – 712	
	65 x 90	16,100	688.03	729 – 736	
	61 x 86	14,300	681.47	722 – 729	
	79 x 109	23,700	688.03	729 – 736	
100	65 x 100	21,800	670.77	711 – 718	
165	67 x 107	39,000	659.40	699 – 706	
	65 x 100	35,500	662.00	702 – 708	
	61 x 86	28,500	658.57	678 – 765	

Generally, teh price for 1 ream of HVS 60g 65 x 100 is 14,500 (Indah Kiat and Ciwi Kima), 14,250 (Suparma) and 13,000 (BRPP and Leces).

Table 3-6-3 Specialty Paper Prices

Grade	Basis weight (g/m^2)	Size (cm)	Mar. '84 Price/ream (Rp)	Mar. '84 Price/kg (Rp)	Remarks
Manifold (white)	28	44 x 69	3,650	859	
(color)	28	44 x 69	3,850	706	
Glassine (white)	28.5	75 x 100	16,500	1,750	Mainly produced by Jujo
(color)	28.5	75 x 100	13,250	1,783	
Greased-proof	38.0	75 x 100	18,000	1,263	Not clear
Cigarette paper					
France			15,00 – 18,000	2,257 – 2,709	
Japan			10,000	1,505	
Domestic:					
Silver bird			6,300	1,242	
Golden bird			6,500	1,282	
Eagle			8,500	1,676	
Imitation France			11,000 – 12,000	2,169 – 2,366	
Poster Paper	40	79 x 109	17,500	1,017	
One time Carbon base		Roll	$930/MT		Roll
Ribbed kraft	38	70 x 120	17,000	(20)[5] 828	Made in China
Onion skin	30	68 x 88	24,000	(8)[9'16] 2,674	Made in West Germany
Woodfree form paper	60	Roll		900	Roll
OPP				2,300 – 3,000	Resin price 1,300 Rp/kg (Tariff)
NCR					Pusakaraya
NCR					Production & sale started in 1983 at 3 t a day.

3-7 Trading and Tariff

3-7-1 Export

Export of paper started in 1979 with a quantity of 6,507 tons, followed by 6,949 tons in 1980, 1,148 tons in 1981, 5,200 tons in 1982 and 10,706 tons in 1983. In 1979 and 1980, almost all quantity exported was printing/writing paper. The export duplex board started to grow in 1981, and 1983 marked export of 3,636 tons of boards.

Printing/writing paper and boards are the two major paper products of in the export, and both of them are products that are produced in excess. The Indonesian government started the incentive policy for export by paying 15% of the check price to the exporter. The export target as set by the government for 1984 is 70,000 tons. Whether or not this goal can be achieved depends on how all enterprises can build the international competitive power by fully utilizing this subsidy system.

The Indonesian government is planning expansion of production by 830,000 tons in 1985 and 1,430,000 tons in 1990, and these exceed the estimated domestic consumption by 40,000 and 150,000 tons respectively.

Since it is estimated that the quantity of imported paper will stay at a level of 200,000 tons, the overproduction problem cannot be solved unless 200,000 to 400,000 tons are exported. The most important matter is that the Indonesian paper manufacturers become competitive in the international market both in quality and cost.

3-7-2 Import

Since about 1975, Indonesian import of paper has been at a level of 200,000 tons a year, Many paper manufacturing companies were established and started production in succession since 1975, but the quantity of import has not declined. The most important matter in relation with the paper import is that Indonesian paper manufacturers become internationally competitive in the grade of paper where they have enough production capacity.

3-7-3 Tariff

Table 7-3-1 shows Indonesian tariff rates of major paper products.

Generally, the tariff rate is low on paper that is politically important (newsprint paper) and those used by government-owned enterprises (kraft paper for cement and fertilizer). However, the level of duty is generally high (import duty 60% and sales tax of imported goods 10%).

No duty is charged to imported waste paper and pulp at present, but there is a sign of applying protective tariff in the near future. If protective tariff is applied to pulp, government-owned mills that produce pulp become very advantageous. The tariff policy of the government plays a very important role in the rise and fall of the pulp & paper industry and it is assumed that the high tariff policy will last until the Indonesian manufacturers develop themselves to be internationally competitive.

Table 3-7-1 Main Paper Import Tariff Table

Description of goods	Tariff Rate	
	Imp. Duty (%)	Sales Tax (%)
News Print	20	10
Printing/Writing	60	10
For News-Printing	30	5
Kraft Liner	60	10
Sack Kraft Paper	60	10
For Cement/Fertiliser Sacks	0	0
Kraft Paper Board	60	10
For Formica Industry	20	10
Semi-Chemical Fluting Paper	60	10
Suiphite Wrapping Paper	60	10
Paper Board	60	10
Cigaret Paper		
In Sheets	60	10
In Rolls/Bobbins	30	5
Blue Match-Box Paper	15	5
Basic Paper For Duplicating and Carbon Paper	10	5
Glazed Transparent Paper	60	10
For Industry	30	5
Kraft Paper	30	5
Tissue Paper	30	5
Carbon and Similar Copying Paper, Stencil	60	10
Duplicator	40	10
Metallic Paper for Paper Condensor	20	5
Pattern Paper for Formica Industry	30	5
Punch Cards	0 – 5	0 – 5
Cigarette Paper		
In the fForm of Ribbon or Rolls	30	5
In the Form of Booklets or Tubes	60	10
N.C.R. Paper	60	10
Heat Transfer Paper	10	5
Confectionary Wrappers	30	5

3-8 BRPP Evaluated from Viewpoint of Sales

3-8-1 Product grades

BRPP produces fine paper of HVS and HVO, litho paper and drawing paper, but none of these have characteristics that are unique to the mill.

The mainstream of basis weight from now on is 45 to 80 g. The average selling price in 1982 was RP 591.14, the average price in May through December 1983 was RP 603.82. When this is compared with the VHS selling price of RP 665 to 740 in the general market toward the end of 1983, BRPP products are sold 10 to 23% cheaper.

The ratio of second grade paper among the whole production is about 15%, which is abnormally high. The second grade paper is sold to a subsidiary notebook company (located on the same premises) at a discount of 20%.

3-8-2 Locational conditions

Being located at a place about 300 km from Surabaya and about 1,100 km from Jakarta, BRPP is quite far from the main market, and when compared with competitors like Ciwi Kimia, Surya Kertas and others, BRPP is handicapped in the location. The breakdown by selling districts is 70% in Surabaya, 20% in Semarang and 10% in Jakarta.

The transportation cost is RP 11/kg to Surabaya, RP 20/kg to Semarang, RP 31/kg to Jakarta. The comparatively large share of Surabaya district in the total sales is appreciative, but the sales in this district must be expanded since BRPP is still behind the others.

3-8-3 User configuration

Since BRPP manufactures and sells ordinary product of printing/writing paper, it has no special user, with an exception of HVS for notebooks, which BRPP sells to notebook companies of their own and others.

BRPP has two selling channels, one directly to end users and the other through agents and dealers. Inspite of the fact that BRPP is a mill operated by the government, it has no customers among enterprises that are operated by the government. We seriously question about this and believe that BRPP should take more positive actions to sell to enterprises operated by the government.

We also think that, as long as BRPP has its own notebook plant, the plant should be extended to increase the ratio of processing its own products, as well as adding more value to the products, thereby increasing the profit.

3-8-4 Equipment and cost

General type paper like printing/writing paper be overproduced in Indonesia even now, and as is clear from the governmental plan for the future, the degree of overproduction will become even greater.

Accordingly, we recommend that the equipment is renovated to be able to produce paper of higher added value (low basis weight high quality paper, specialty paper, etc.)

With regard to the finishing process we can say that the finishing work, product warehouse space, transportation equipment within the plant, and packaging are all in good state.

the administrative practice is excellent.

3-8-5 Quality evaluation in the market

Within the limited research done by ourselves, visiting users in Jakarta, not a few of them, even dealers, were aware of what kind of paper BRPP was producing. Therefore, we cannot report about the evaluation of BRPP products in the market.

In Surabaya, which is the main market of BRPP, BRPP products are ranked at the lowest position as described in 3-5. BRPP products are evaluated very low and this is attributable to the unstabilized quality. Even sample books, which are very important for sales activities,

contain dusts, or the color shade is different even on the same type paper. The stabilization and improvement of the quality is the key to getting better selling prices.

3-8-6 Recommendable New Production Items

The details are described in 3-10, but we recommend that BRPP produces form paper, oil-proof paper and paper for lamination in consideration of the market scale, degree of necessary renovation to be given to existing equipment, and accumulation of production knowhow.

Glassine paper is being imported and it is a promising product, but the paper machine must be completely renovated to produce glassine paper. Glassine paper cannot be produced if the current facilities are renovated partially.

Production of carbon paper or onion skin paper is even more difficult.

3-9 PPM Evaluated from Viewpoint of Sales

3-9-1 Product grade

1) Unit I (Old Plant)

Most of the No. 1 and No. 2 machine products are delivered to organs related to the government, and the production and sales of PPM are at more favorable position when compared with other paper mills.

However, as a result of active sales campaign of other mills to organs related to the government, the growth of the demand is now limited, and there is a trend of the demand for Unit 1 group products not growing any longer. PPM also produces ordinary paper and is trying to enter the market, but PPM is not competitive price-wise.

Accordingly, Unit I must make efforts to increase the share on the traditional products that it has been selling by fully utilizing the unique production facilities, and whatever excess in the capacity (estimated to be about 400 t/y) after implementation of this renovation project, of which expanation is given later, should be used for production of middle grade cigarette paper.

2) Unit II (New Plant)

No. 3 machine has now been operated for about 10 years as the only exclusive cigarette paper machine in Indonesia. The initially designed production capacity of five tons a days has been increased to ten tons a day, and on the production capacity, No. 3 machine is by no means inferior to other machines world scale.

However, the product quality is behind others on a world scale and this is due to improper stock furnish combination, inadequate details of the equipment, and improper operation control, and the production is limited to manual rolling middle class cigarette paper only.

According to official statistics, about 9,000 tons of cigarette paper is imported every year, and early expansion of No. 4 machine is greatly expected.

A piece of information we heard is that cigarette manufacturers, Gudang Garam, Delitua Delta and Jatelhul are planning the production of cigarette paper.

As the immediate steps to realize expansion of No. 4 machine, the following must be pursued:

a) Unit II produces cigarette paper to compete with imported cigarette paper. Efforts must be made to improve the production technologies and to expand the sales outlet.

b) Unit II must plan increase of production after reducing the production of non-profitable grade products and stabilizing the paper quality. The excess of production capacity thus realized should be used for middle grade cigarette paper production.

3-9-2 Locational conditions

PPM is located about 150 km from Jakarta, about 30 km from Bandung and about 1,000 km from Surabaya. Although this location is not as advantageous as most private paper mills are, PPM is more favorably located than other government-owned paper mills are.

The selling district varies by paper type, but roughly products of Unit I are sold in the metropolitan area and products of Unit II are sold in central Jawa. The breakdown of Unit I product selling district is 58% in Jakarta area, 25% in Bandung area, 11% in central Jawa, and 6% in other areas.

Since the majority of Unit II products are cigarette paper, they are sold in central and eastern Jawa where most of the cigarette manufacturers are located. Since the selling price per kg of cigarette paper is high, differences of transportation cost can be absorbed by the selling price.

Since Padalarang is close to Bandung, PPM has the advantage of using the Institute of Fibre Technology for quick testing and research. This institute must be actively used for testing of developing products.

3-9-3 User configuration

Due to the purpose of mill establishment, Unit I sells the products to governmental and municipal organs. The breakdown of users is 10% to governmental offices, 70% to agents and dealers, and 20% to converters, but more than 50% of end users are governmental organs. The largest user is Perum Perce Takan Uang Republic Indonesia (Government Security Printing Company) and this consumes 30% or more of Unit I products.

The main agent is P.T. Margono Dian Graha, who handles much of cigarette paper as well.

The users of Unit II products are cigarette companies which form one of very important industries in Indonesia. Because of quality problems, Unit II products are not sold to the three largest tobacco manufacturers, and the sales are limited to small to medium cigarette manufacturers, most of which are located in Bandung, Semalang and Kudus areas.

3-9-4 Equipment and cost

1) The characteristics points of Unit I, as evaluated from the viewpoint of sales are that it has straw pulp making equipment and is suitable for small lot production. On the other hand, its production cost is high.

It is estimated that the production cost is RP 200/kg higher than competitors, comparing the cost on the same product. Therefore, Unit I must produce specialty paper that make the best use of the equipment.

On the finishing process, the following improvements are necessary to raise the image of the product.

a) Wider space in the product warehouse

b) Complete pavement of the floor of finishing plant and product warehouse

c) Improvement of transportation equipment (installation of clamp forks, for example)

d) Better product handling (The current handling damages the product too much.)

e) Driving out of poor packing materials (The packing kraft paper easily breaks, the plate for bale packing are not uniform, etc.)

f) Improvement of pallet and bale legs to facilitate the handling

g) Better looking labels

2) Unit II has no serious problem with the equipment to produce cigarette paper. The production capacity is about ten tons a day, which is not bad in the international comparison.

However, a quality guarantee system must be established as quickly as possible.

Unit II has no equipment to produce rolled paper, and the current product cannot be sold for use for machine rolled cigarette which is increasing in the market.

Additional finishing machine and slitter are absolutely necessary. Since Unit II has the grounding in competing with imported paper, we certainly expect that it changes the production and sales to compete with imported paper by improving the manufacturing technologies and quality control system.

3-9-5 Quality Evaluation in Market and Selling Price

Table 3-9-1 shows the product prices of Unit I, and except for HVS there is no objective to compare the price with. There is a large difference in the quality between items that are profitable and not profitable. We hear that Perum, governmental organ, evaluates Unit I products low and users say that almost no paper is produced to the specifications. The basis weight, paper thickness and sizes are always varied and the paper always contains stains.

The number of sheets per ream is not steady, or less than 500 in most cases. The designation position of water mark is shown in the reverse way, and thus there are many complaints.

The prices of Unit II products are shown in Table 3-9-1, and these prices indicate that products are sold about Rp 1,000 per kg lower than imported paper. Also, there is a weight loss of about 8% in the basis weight (24 g/m^2 on imports and 26 g/m^2 on PPM products).

For all these reasons, the establishment of production and control technologies to compete with imports and establishment of sales outlets are required as quickly as possible.

Table 3-9-1 Sales Price of PPM (1984 Budget)

Unit I Brand	Rp/Kg	Unit II Brand	Rp/Ream
H.V. Offset	872	Silver Bird	6,300
H.V.S. Export	335	Golden Bird	6,500
Cyclostyle	671	Eagle Bird	8,500
Mailzegel	2,155	Eagle Bird Special	11,000 – 12,000
Bandrol 60 g	2,027		
Reform	933	Imported from France	12,000 – 15,000
S.P.R.	2,133		
Cheque Note	951		
Kertas Water Mark	1,659		
Post Wesel	824		
Kartu Post	870		
Door Slag	915		
Bank Post	861		
Sigaret	1,191		
Couverture	644		
H.V.O. 80 g	434		
H.V.O. 200 g	363		
H.V.O. Birtua 70 g	295		
Kraft Coklat 45 g	316		

3-9-6 New Products Recommended for the Time Being

We recommend that the production of non-profitable items of Unit I are sequentially changed to production of middle grade cigarette paper.

As to Unit II, we think it important that it can produce grades that can compete with import and machine rolled cigarette paper.

3-10 Investigation of Specialty Paper

In 3-3, we listed oil-proof paper, paper for lamination, computer form paper and cigarette paper as recommendable items. This clause describes these items and NCR.

3-10-1 Computer form Paper

There are several types of computer form paper; 52.3 g/m², 64 g/m², 104.7 g/m², 127.9 g/m² and 157 g/m², and the common types are 52.3 – 64 g/m².

There are two types of colors, solid (white) and colored, and the majority is in solid. In Japan, the quotation of base paper is ¥270–280/kg, and since the computer form paper quotation is 80% of that, the price in Japan is ¥216 to 224/kg.

The price of imported form paper is about Rp 1,700/kg including 70% of tariff and commission, and it is a high price grade for wood-free paper.

Since this paper has a rather high growth rate, we recommend that the paper be trially made by both mills and the two mills be made ready to start any time. We recommend that BRPP produce the form paper in the category of 52.3 to 64 g/m² and PPM 104.2 to 127.9 g/m².

The paper making conditions are rather severe on (1) elongation/shrinkage, (2) of paper for mounting ranges widely form 8.6 inches to 18.2 inches.

3-10-2 Base Paper for Lamination

Various type of paper like pure white machine-glazed paper, fine paper, one-side coated paper, glassine paper, separate paper, and kraft paper are used for lamination depending on the usage. We are recommending fine paper as a type that can be produced by both of BRPP and PPM.

The basis weight of fine paper ranges from 40 to 80 g/m², and it can be used for either printing/writing or lamination. In using it for lamination, at least one side should be glazed, and since it is used for foodstuff wrapping often, all virgin pulp must be used. The base paper is laminated with an aluminum film, polyethylene or OPP or aluminum is vapored on it.

The price of base paper in Japan is maker price ¥200 per kg. The export price is about ¥185/kg, FOB Japan, which comes to about Rp 1,500/kg when sold in Indonesia.

Depending on the usage, either domestic or imported paper is used and the ratio between the two is unknown.

The following precautions must be paid when making base paper for lamination:

No dust
The thickness must be uniform.
A certain strength is necessary since it is processed from roll to roll.

Also, the paper mill must consult with the laminator on the requirements of paper in advance.

3-10-3 Oil-proof Paper

Oil-proof paper is made in the material furnish combination of fine paper but added with oil-proof agent. Since the paper has a grease-proof effect, it is used for wrapping or bags for bread, doughnuts, fried bread, fried food in which edible oil is used.

At present, Indonesia imports most of the oil-proof paper from China, Japan, Taiwan, and West Germany. The oil-proof paper from China is low priced, those from Japan are priced higher and those from Europe are priced highest.

The price of oil-proof paper is about Rp 1,260 per kg, which is about twice as high as that of general wood free paper.

There are two basis weights; 38 g and 40 g. Since oil-proof paper is much used for wrapping of popular food like bread, fried bread, the paper is S old to small to medium size foodstuff processors, and naturally the paper is sold in the flat form (75 x 100) mostly.

Although it is conceivable that the share of oil-proof paper will be taken by CPP and others gradually, the demand will slightly increase in the sense of absolute quantity.

3-10-4 NCR

The customs clearance for import of NCE in Indonesia for 1982 is 372 tons, and the quantity of import may be interpreted as the quantity of consumption. However, during 1982, Japanese customs clearance of NCR for export to Indonesia was 1,896.2 tons (investigated

by Japan Paper Manufacturers' Association), and we think that the statistics of the Indonesian side is incorrect. When smuggled NCR and NCR imported from other than Japan are calculated, the demand exceeded 2,000 tons even in 1982.

In the coming ten years or so, an increase of demand of 5% per year is expected. Pusakaraya Co. introduced the coating technique from West Germany and started the production in 1983. The daily production capacity is said to be 5 t/d but the actual coating is 3 t/d, with sure expectation of reaching 5 t/d by the end of this year. This is equivalent to 1,500 t/y. Since the target is 10 t/d, or 3,000 t/y, the demand in Indonesia is exceeded by the production of Pusakaraya only. Ciwi Kimia has also determined to obtain a license from the United States, and the company will start the production in 1984.

There is information that Pakerin mill starts the production of NCR in the near future. In addition, we hear that several printing companies are planning the production. Accordingly, the plan of PPM and BRPP starting the NCR production at this point is a plan that neglects the actual situation.

In addition, production of NCR bears the following risks:

a. Development of base paper

b. A capsule production unit must be installed anew.

c. Coating equipment must be installed.

d. It takes at least two years before Items a, b, and c are completed.

e. The production capacity of two years later will substantially exceed the domestic demand.

f. Even if the production is in excess, exporting NCR would be difficult because of the licensing arrangement.

Even if it could be exported, there is simply no prospect of winning the competition with advanced countries (Japan, USA, West Germany) in the quality, price and production scale.

g. Extreme care is needed to transport NCR since the NCR color develops when a shock is given. The handling equipment, packaging and transportation system with shock prevention effect are needed, and the current handling of PPM and BRPP is not suitable at all.

This is especially serious to BRPP since it is away from large consuming areas of Jakarta, Surabaya and Semarang, and to transport NCR for such long distance is not normal.

h. The price obtainable for NCR is about double of the base paper.

i. We have obtained product samples of Pusakaraya and conducted a coloring test. The response is not quick, and anyone who has used NCR of advanced countries tend to dislike the Pusakaraya product.

Thus, the mill will have to carry much risk on the production and sales of NCR final product. Therefore, even if steps could be taken for development and production of base paper for NCR, we cannot recommend PPM or BRPP starting the vertical production of NCR up to coating.

With regard to the development of base paper for NCR, Pusakaraya uses imported base paper for their production of NCR at present, and it looks as if satisfactory NCR cannot be made out of base paper domestically produced under the current technology. Therefore, we recommend that efforts are made to develop such base paper, thereby raising the demand in this aspect.

Chapter 4.

CURRENT SITUATION OF PADALARANG PAPER MILL

Chapter 4. CURRENT SITUATION OF PADALARANG PAPER MILL

4-1 Mill History

It was in 1922 (Indonesia was still under Dutch rule) when Padalarang Paper Mill was founded in the suburbs of Bandong as the first paper mill in the history of Indonesia.

The Mill was originally organized as an Indonesian branch of NIJMEGEN Paper-making Co., a Dutch limited private company, starting its operation with No. 1 paper machine in 1924 along with the production of straw pulp. During the initial phase of its operation the main product of the Mill was printing and writing papers for official use for the government and other public authorities. Then in 1932 the Mill introduced No. 2 paper machine, and subsequently in 1938 Leces Mill II was constructed in Probolinggo. After the Independence War the Mill was taken over by Indonesian people. With the nationalization of companies of Dutch origin in 1961 the original Mill was separated from Leces Mill II, to independently restart as a government own company named Padalarang Paper Mill under the supervision of the Directorate General of Basic Chemical Industry, Ministry of Industry.

In 1973 a small-scale modification was carried out for both No. 1 and No. 2 paper machines and for the pulp section; in 1975 a new No. 3 paper machine was exclusively installed with the cooperation from Japan, for production of cigarette paper. This additional equipment is the only cigarette paper machine currently existing in Indonesia while the No. 1/No. 2 paper machines continue to be used exclusively for the production of lightweight printing and writing papers for official use.

4-2 Location

Padalarang City, Bandong Prefecture, West Jawa State, the Republic of Indonesia, about 18km northwest from Bandong City.

4-3 Site Area 10ha

4-4 Sales Record

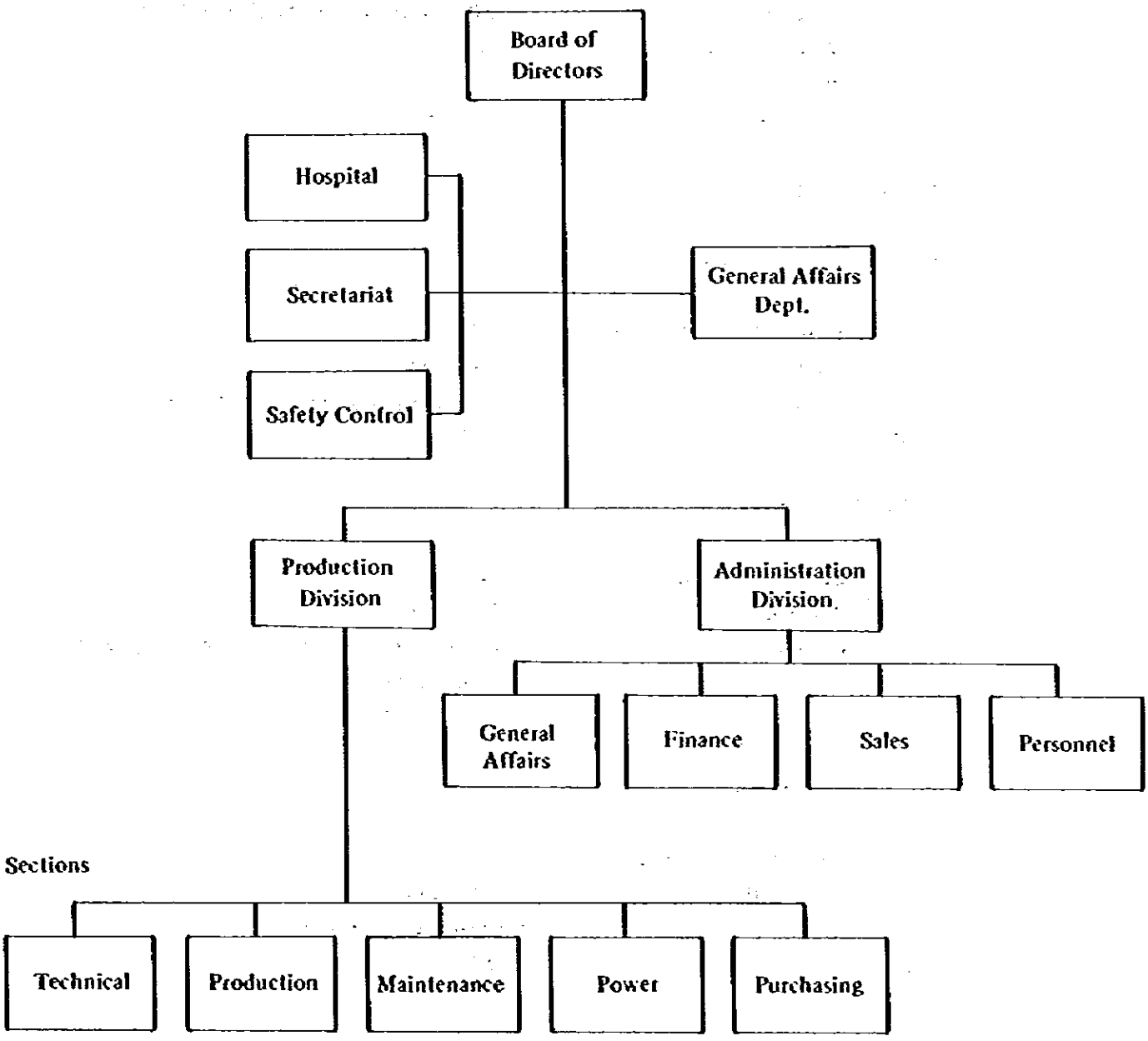
*Figures for pulp section indicate output. (in tons)

Year / Section	1979	1980	1981	1982	1983
Pulp	1,587	1,050	1,241	1,345	1,108
Unit I	4,408	4,748	4,361	4,172	4,067
Unit II	2,687	3,163	3,193	3,533	3,007

4-5 Labor and Organization

1. Number of employees : 785 (1981)

2. Organization Chart



4-6 Main Equipments

4-6-1 Pulping equipment

- Current production capacity : 5.9 ADt/day
- Straw treating equipment : X 1 set
- Digesters : 30m³ vertical X 5; 24m³ global X 1
- Washing screen : X 1 set
- Bleaching equipment : X 1 set
- Wet machine : X 1 unit

4.2.2 Paper machines

1) No. 1 paper machine

- Current production capacity : 10t/day
- Wire width : 2,400mm
- Grades : Printing/writing and specialty papers

Refiners : C.R. X 2

2) No. 2 paper machine

- Current production capacity : 5t/day
- Wire width : 2,250mm
- Grades : Lightweight writing papers, special type of cigarette papers

Refiner : D.D.R. X 1

3) No. 3 paper machine

- Current production capacity : 10t/day
- Wire width : 2,440mm
- Grade : Cigarette papers only

Refiners : D.F. X 7

4-6-3 Finishing equipment

*( ) indicates semi-idle equipment.

- Double cutter : X 2 units for Unit I and II
- Guillotine cutter : X 1 unit for Unit II
- Supercalender : X (2) units for Unit I
- Bobbin slitter : X (2) units for Unit I
- Single cutter : X (3) units for Unit I

4-6-4 Utility service

- Electric power :
  - Consumption : 1,000 – 1,200 MWh/month
  - Generator : X 3 units (220 kW – 275 kVA)
  - Contract : 3,120 kVA

- Steam
  - Boilers : Water tube boiler X 1 X 2t/day
    Smoke tube boiler 1 X 2.5t/day
    Lancashire boiler X 2 X 2.5t/day

- Water
  - Source : A fountain located at about 5km north from the Mill (Cisusupan); The source will be wasting away year by year.
  - Consumption : 8,630 m^3/day (excl. well water)

Chapter 5.

MILL CONTROL AND THE SUMMARY

Chapter 5. MILL CONTROL

It is a mill with history succeeded from Holland as a state paper making company and is a good mill which has recently turned to a profitable operation through the skillful management strategy.

As a state enterprise, it must aim at a stable expansion of employment and effective use of the existing equipment and is not allowed to parsue "scrap and build" method, and therefore, its major subject is how to improve the existing equipment and increase the productivity.

Under such a background, the survey of this renovation project was started.

Therefore, it is urgently required to increase the earnings by solving the problems of the existing equipment, increasing the total yield, manufacturing efficiency and reducing the production cost and at the same time to take various measures to establish a competitive quality to cope with the severe competition in the market, i.e..

1) It is necessary to establish the control standard and intensify the limit control by making a proper equipment investment and reducing and stabilizing the variating factors in quality and efficiency.

2) Complete cost control and reduction of manufacturing cost based on it

3) Promotion of quality control and establishment of production cost based on it

4) Complete market control. It is necessary to take measures to be the winner in the overcompetition with the private companies by catching the needs of the market in advance and promptly and effectively coping with them.

5) Establishment of equipment control system and enhancement of self-improvement will.

6) Promotion of TQC and awareness of the need for innovation.

7) Establishment and utilization of jobsite circles

The above measures are urgently required.

PPM is used to its management method based on its long history, i.e. the "seller's market" attitude, and it is urgently required of it to acquire a strategy to cope with the increasing "buyer's market" tendency.

This chapter describes the quality control, product and market control and equipment control which are required to be intensified after the improvement work.

To the end of this chapter a control chart of the present situation of the production control to serve as an aid to the intensification of the control after renovation plan.

5-1 Quality Control

5-1-1 Outline

1) The quality control is a method to solve problems which was invented at the time of mass production and supply of arms during the World War II.

2) Recently the quality control means all the systems used to produce products economically with the quality to meet the needs of the market which are being sophisticated at an accelerated pace.

3) The quality control consists of physical quality control and mental quality control and the TQC (Total Quality Control) often heard recently means the latter and its technique is supported by the physical quality control.

4) As a generally accepted idea, it is necessary to establish an economical quality (mutually acceptable limit quality) to conclude a commercial transaction based on mutual trust, and it is necessary to have information exchange between the seller and buyer on basis of which the standard and control limit are set.

5) By restricting the shipment of defective products through the market is made unnecessary and the wasteful expenses can be reduced. Depending on the degree of

the deffectiveness, the will to improve the equipment and operation is created and the lifting of consciousness toward innovation of the entire mill will be developed.

6) The quality control in the process industry is a minimum requirement for increasing the efficiency, improving the quality and reducing the cost.

5-1-2 Effective Quality Control

1) The quality control is to develop, design, produce, sell and service a product of the quality which is most economical, most useful and satisfactory to the buyer.

2) In order to achieve such objective, it is necessary for all the departments and sections including management, production, engineering, facilities, research and development, administration, accounting, purchasing and sales to cooperate in a unified way and for all the organizations to become one group to set the "standardization" and implement it.

3) The term quality has a small effect if it is interpreted to mean only the quality of product, but if it is more widely interpreted to mean the quality of management, a big effect can be obtained. The spiritual and technical quality control tackled through the unified efforts of the management and mill with such a wide interpretation is called TQC which is now widely used in the world.

4) But the basis for the TQC is the QC technique and this QC technique must be understood first, and then the subsequent application to the technical and spiritual quality control should be expected, and one way directions from top to bottom should not be used unreasonably.

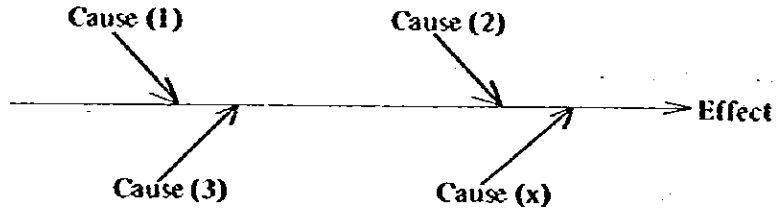
5) As an application method of bottom-up QC, the QC circle, i.e. jobsite circle is to be cited.

5-1-3 Application of Cause/Effect Diagram

1) In order to recognize the latent problems in the mill and to solve them, enhancement of the progressive mind is desired. If only the top management recognizes the problems, concrete measures and efficient improvement cannot be expected.

2) In order for all the employees to have the critical mind and to acquire the will to improve the things it is the shortest way to understand and apply the cause/effect diagram.

3) The cause/effect diagram can be used in the stage of quality design and also for clarifying the problems in the operation, i.e. for analyzing multiple causes as the cause-effect characteristics.



The cause/effect diagram is also called fishbone diagram.

4) The analysis of causes is very important in the mill equipment, especially in pulp and paper industry. It is recommended that the cause/effect diagram be prepared for each problem through discussion in the QC circle, etc. and be made as an operation standard.

5-1-4 Application of PDCA

1) PDCA is a name for the QC cycle and means a series of looping work of Plan-Do-Check-Action.

2) PDCA should be effectively used for the improvement and adjustment for the preceding and following processes by combining the rating and judgement of the standard work as a means and the product quality as a result and the judgement of the factors by means of the sampling inspection in the preceding process concerning the daily work and the instructions (target) prior to working.

3) PDCA is also used for research and development of new products, design of experiment in the table test in a testing room, etc., and for the experiment on a change of pulp furnish in order to reduce the cost of the existing brands.

4) PDCA can be viewed as management with a target to be pursued.

It is used as a means to set long-, mid- and short-term targets as the diversified management strategy and to reach the final goals.

5) Since PPM has many problems to be solved in the future, such as production planning and minimization of changeover loss from grade to grade because it produces a number of products in small lots and has quantitative restrictions with the time of delivery required for the products, the PDCA should be effectively utilized.

5-1-5 Application of Control Chart

1) Variation of quality

(1) When products of same specifications are repeatedly produced in a large quantity in accordance with a specified operation standard, the quality does not become same whatever efforts you may make, because the products are affected by unknown or unexpected causes.

(2) When it is possible to estimate, from the past experience, by showing at least a limit, how a phenomenon will change in the future in the quality of not only the paper product but also other industrial products, the phenomenon is "controlled".

(3) The "estimation by showing a limit" means the possibility of indicating at least approximately the probability of the phenomenon observed being within the specified limit.

(4) The estimation is always accompanied by the element of chance, and this is taken into consideration when the foundation for scientific estimation is fixed.

-1. (Controlled variation)

Variation whose cause is not worthy to be identified, i.e. the variation due to change only.

-2. (Variation not controlled)

Variation, where to locate and eliminate the cause for the variation leads to a profit.

2) Wrong actions

The operator engaged in production may sometimes cause the variation of quality by taking a wrong action under wrong recognition.

(1) Error to make adjustment of a production process through the efforts to locate a cause while there is no such cause for variation.

(2) Error to neglect the investigation of a cause while such cause for variation exists, and not to take a corrective step.

The above two errors are wrong operation, but the human being cannot avoid them completely.

If instrumentation is promoted in the future through the improvement of equipment, the wrong operation of case (1) will increase.

From this viewpoint, too, it is desirable that the field control is intensified by using the control chart and setting the control limit.

3) Control chart

(1) The control chart is a record where the quality is graphed but is different from the ordinary record in that control limits and centerline are written.

This control limit becomes a yardstick for judging the characteristics of the quality variation (i.e. whether it is a cause from the preceding process or a cause in own process, etc.), i.e. if a point plotted is outside the limit, it should be judged that there is a latent "assignable cause" and the efforts should be made to locate the cause and eliminate it. If the plotted point is within the limit, no action is required judging that a stable operation is on.

(2) It is desired that the finishing yield be improved and the credit recovered from the users by plotting this control chart every hour on the field and using it as a tool to minimize the production of non-conforming products.

4) Application of control chart

(1) On the basis of the control chart, it is possible to conduct various analysis, to know the quality characteristics of each lot, and to control the shipment by users respectively.

(2) It is also possible to analyze the cause when a claim occurs and to be released from the one-sided discount deal.

5.1.6 Standardization of Quality and Operation

1) Considerations on standardization

(1) When an article or operation is judged good or bad or a method to guide how to proceed with a work is determined, a fair and reasonable judgement cannot be made without the standards.

(2) The standard is to specify as a yardstick for judgement, the quantity and quality of an article, method, human action, how to pass memos, procedures, terms, to be used etc..

The standardization means that the standard is prepared through the study of objective and the use of rational methods and such standard is observed throughout the organization.

(3) It is expected in the future that the improvement work will be carried out and the operation with new equipment will start, and prior to the operation, these quality and operation standards should be prepared without fail.

2) Company standard

It should have the contents everybody can observe it and should be easy to use.

(1) Practicability

It must be practicable. If it is difficult to put it in practice, there is a fear of inviting a feeling of loading the standard.

(2) Codification

It must be equipped with objectivity and concreteness, quantified and codified, otherwise it can be hardly maintained because of the lack of reproducibility.

(3) Completeness

There should be no conflict or discrepancy among the standards by items.

(4) Clearness

It is useless if it is difficult to be understood.

Also useless if it can be interpreted in several ways.

5-2 Marketing

5-2-1 Necessity

1) Marketing control means that the standards of information to the marketing forecast and its marketing strategy for what man produces or what man will produce in future are set and controlled.

2) The system of the marketing research organization itself has not yet been established in Indonesia. PPM also is no exception from viewpoints of the organization and personnel stationing.

3) To strengthen the marketing control, it is necessary to reform the business organization. Namely, the present sales department performs mere office work. Therefore, it is not too much to say that it is a nominal business department. It is a prompt requirement to expand the sales department and the number of salesmen. As stated in Chapter 3, the staff in charge of the job, who should be active selling personnel, keep staying in the office and only the top instead of going out to the front line, the market, management of the company execute sales activities. Under such circumstances, the range of the sales activities should be limited extremely.

4) The big paper users in Indonesia are very limited, such as Dainippon Printing, Toppan Printing, Victory Offset, etc..

Paper products of the Governmental own company are hardly delivered to such big users. Consequently, the present PPM sales department is not in a position to get the information from these users. Accordingly, the department is currently unable to win and get new users. (That is another matter when the new user visits PPM and requests to purchase the products.)

To control the market, the information must be gained via the sales specialist by all means.

5-2-2 Recommendation from the result of Marketing Research

1) Developmental Promotion to Branch Office from Jakarta and Surabaya representative sections.

The present representative sections are very much different from the sales execution departments.

They should be the departments mainly concerned with sales activities and be a salesman-cum-representative.

Respective branch offices should consist of 3 staff.

2) Two representatives should be resident in Semarang and win to get users with the cigarette maker in central Jawa territory as a main user.

3) PPM head office should be in charge of Bandung territory.

On the above-mentioned business organization, information gathering functions are advanced and marketing research is executed.

Based upon this, it is important to determine the sales policy with the business information and full worth of the company in combination.

Marketing control items are price trends, market size, other companys' trends, distribution, change of quality demands, etc.

The contents of the job are analyzed as follows:

(1) Data making of market needs

-1. Contacting with reliable information sources to get data

-2. Examination of rearrangement and conformity of data obtained from reliable information sources

-3. Comparison with previously obtained data and other information

-4. Selection and rearrangement of necessary data

(2) Feedback of data to top management, factory top management, and necessary sections.

(3) Summarizing analysis of judgement and answer by top management concerning the possibility of the execution.

(4) Prearrangement with the production site.

(5) Trial products production and negotiation with the user.

(6) Trial-use in the presence of the user.

(7) Setting of the price and setting of the marketing route

As stated above, the job should be controlled by the data.

5-3 Product, Order-receiving and Shipment Control

5-3-1 Product Control

For the foundation of the product control, checking of actual stock against the product ledger should be made. Consequently, it is unavoidable to arrange the work environment (finish factory and warehouse) easy to make the product ledger.

1) Making of Product Ledger

When the control system where the stock up to the previous day, receiving of daily finished products (production), daily delivery (selling) and the stock of the day can be recorded without mistake, is established, monthly, semi-annual and annual ledgers can be made.

2) Revision of Product Ledger

If the revision is not executed on the spot when the appropriation and entry error between the products are found out, the revision become hard as time goes by.

3) Utilization of Product Ledger as Auxiliary Measure of Selling Means

(1) Based upon the completed product ledger, the standards of reduction or adding-up of the stock and sales policy for the faulty products are made.

(2) Graph-making of Daily Account Table, Monthly Account Table, Term Account Table and Annual Account Table

The trends of production, selling and stock of each product through the graph are considered, budget for the production and selling is controlled and advantageous and disadvantageous brands are carefully selected.

5-3-2 Order-receiving and Shipment Control

1) The same control as the product control should be executed. More sophisticated actual stock control than the product control is required.

2) Shipment system different is many cases according to the difference of the order-receiving system (letters, received order table, telephone, telex, facsimile, etc.)

Order-receiving items are made into format and the users need to be made to understand the items.

Note) Making into format:
Standardization of ordering customer and delivery destination and its telephone number, delivery time, product name, basis weight, dimensions, quantity, price, packing, delivery means, etc..

3) Next, it is necessary to arrange the system for which the judgement of the realization of order-receiving is made by confirming the stock generally and instantly such as from the aspect of the delivery time and quantity or from the aspect of the quality and price.

4) The response whether to accept or reject the order should be made without delay.

5) At the time of delivery, it is necessary to deliver the products by securely confirming whether or not they are the products as ordered.

6) At the time of delivery, it is necessary to handle carefully in the way of sticking the easily legible label, making a contract with the reliable transportattion company, effecting the nonlife insurance on the way to transportation. The issuance and re-

ceiving statement, etc., at the time of delivery also are necessary to be attached and confirmed.

7) Finally, the necessary items should be filled in the product ledger securely after delivery and should be the basic data for the claim and re-ordering of the same users.

5-4 Process Control

5-4-1 Outline

1) The Process control means gerneral control of direct and indirect production facilities for the profit-making enterprises and is to make an effective use of the equipment in possession through the expansion and modification of equipment, procurement of parts, equipment maintenance to assure normal operation and renewal of the equipment. And especially for the pulp and paper industry, a process industry, it is one of the most important controls which affects the quality of product and earning of an enterprise.

2) Generally the equipment used to become superannuated or old-fashioned, redeem and renewal are required. Unit then, it is necessary to ride on the wave of the times by continuing the necessary improvement from time to time to cope with the advancing technological innovation and price escallation. A proper investment attitude will be highly appreciated as a positive management strategy.

3) Of the equipment controls, the productive maintenance is most important for the earnings of an enterprise, and it relates to the equipment maintenance. It is very important to concentrate on the preventive maintenance and reach the region of productive maintenance as soon as possible.

4) We hope that this project should be met with an opportunity to make a first step toward the scheduled process control.

5-4-2 Objective of Process Control and Operation Policy

1) Scope of control

It covers all the controls of the equipment of an enterprise concerning the planning, procurement, maintenance and renewal.

(1) Land and buildings
(2) Direct productive equipment
(3) Transportation equipment

(4) Auxiliary equipment and utility equipment (electricity, steam, water, air)
(5) Safety equipment
(6) Office equipment

2) Objective of control

In a mill, all the above process must be economically procured, arranged and maintained to produce good products quickly and at low cost without troubling anybody. It is progress in the industrial technology. The objective is to perform a rational process control to achieve them.

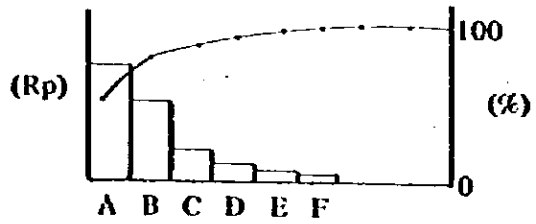
3) Operation policy

In order to achieve the above objective, a radical change is in progress from the passive attitude such as repair activities for the damage and failure of the equipment to preventive maintenance, to productive maintenance aiming at higher productivity and further to the positive renewal of the equipment which brings much higher productivity.
That is, the recent general situation is that a big change is occuring in thinking from the passive equipment control to repair the superannuated or worn equipment. Also attention should be paid to the measures to increase the operating efficiency of the equipment, standardization of the proper use method of the equipment, and increase of the effective operation time and faster preparation for servicing and repairing works for shortening of the starting time, etc.

5-4-3 Method of Process Improvement with the way of Analysis.

1) Application of Pareto's diagram

(1) Pareto's diagram shows the problems analyzed by phenomenon and arranged in the sequence of largeness.



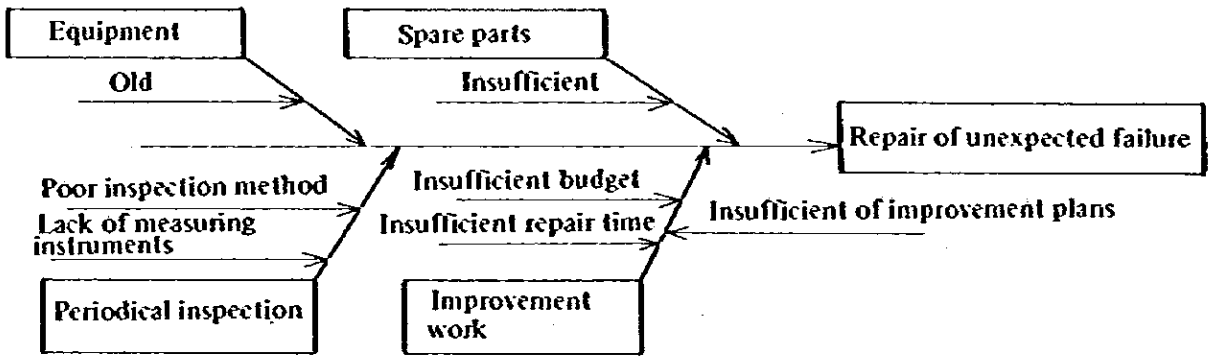
(2) It should be used when totalization is made by using the annual statistics such as frequency of machine failure.

(3) This Pareto's diagram can also be used for pigeonholing of the problems in a job site circle and explanatory data for improvement proposals.

2) Cause & effect diagram

(1) It is also called fishbone diagram. See the explanation in 5-1 Quality Control.

(2) For example, it can be used as follows for the process control.



3) Application of KJ method

(1) It is used when there are those who cannot speak out in front of other people when a small group of about 5 persons discuss on the process improvement (such persons often have good opinions) or when they want to talk frankly without need of paying attention to the echelon in the office.

(2) About 10 pieces of small paper of about 5 x 10 cm are distributed to each person and everybody writes his proposals in a legible form without consulting with other people. Their names are not written.

(3) After totalizing, the proposals are grouped by content and by function and classified by block.

(4) The theme names are written at the top and a line is drawn from each block.

(5) The content in each block represents a factor to be connected to the theme.

5-4-4 Control of Utilities

(1) The utility process is the equipment to supply the fluid and energy necessary for the operation of the factory. It includes the generating, supplying and treating equipment of electricity, steam, industrial water, gas, fuel and compressed air, etc.

(2) In the pulp and paper industry the utility has a big share in the production cost and often becomes the main cause for "below cost" due to the cost push by prices escallation.

1) Heat Control

(1) The share of the steam cost in the production cost of pulp and paper is very big. The steam cost in PPM is high at 20,600 RP/t (1983) and shares as much as 10 – 30% in the production cost.

(2) The heat control includes the fuel control, combustion control, transportation control, use control, waste heat control and instrument control and is a generic name for the controls for which the establishment of control system is desired, covering a wide area of maintenance control, operation control and safety equipment control of the heat related equipment.

(3) The recovery of waste heat directly affects in improving the thermal efficiency. Positive improvements are desired, such as the use of the waste heat boiler, preheating of air, and heating of water through the recovery of the waste heat.

(4) The control of the steam generating source is the most important of heat loss in the piping, leakage control and efficient use at the users. The steam consumption depends on how effectively the heat is supplied to the product.

(5) A key to the boiler efficiency is to return the condensate of the steam in big quantity and at high temperature. In the case of the pulp and paper industry, it cannot be expected to return the steam for cooking in the pulp plant and the direct blow-in steam in other plant. But the steam for paper machine can be recovered and re-usable.

Presently PPM has 3 paper machines and the paper production is about 25 ADt/d, and therefore, if the unit ratio of steam consumption is, for example, 5 t/t, the amount of steam is 100 tons/day and theoretically there must be return of 100 t/d, and if not, it should be considered that there is leakage somewhere.

(6) The term of evaporation rate of a boiler is equal to the amount of steam (ton) generated when 1 ton of fuel oil is burned. Generally, in the case of a new water-tube boiler, the evaporation factor is unit calorie of fuel oil/unit calorie of steam in atmosphere, and therefore:

9,800 x 0.85/640 = 13.0 (kg/kg = t/t)

In this case the fuel consumption rate is 1,000/13.0 = 76.9 kg/steam ton, but if the average thermal efficiency increases to about 90%, it becomes 14.0 t/t.

Presently PPM has 4 boilers in total, and the fuel consumption and evaporation factors are as follows:

	(Fuel consumption)	(Evaporation factor)
Lancashire No. 1	104 lit/t	10
Lancashire No. 2	103	10.1
LVW smoke tube	103	10.1
Kure water tube	87	12.0

That is, in the case of 200 RP/t, the steam cost is 20,600 RP/t for Lancashire and LVW, and 17,400 RP/t for Kure. It is 21,670 RP/t in the budget of 1984 of PPM.

(7) Fuel control

The KURE boiler operation was started in 1975 and nearly 10 years have passed, but the evaporation factor is low at 12. This may be due to the incompleteness of the boiler maintenance control, improper combustion control or low quality (calorific value) of the fuel purchased. When the fuel is selected, not only the price but also the unit price per effective heat value should be taken into consideration.

(8) Combustion control and operation control

Since the boiler is to evaporate water by transferring the combustion heat to the water via iron pipes, the maintenance of the heating surface is required to keep better thermal conductivity. If scale is accumulated in the piping or soot is sticking to the outside of the piping, most of the heat is discharged into the atmosphere. Therefore, the measurement of the smoke is a requirement for the operation control of a boiler.

(9) According to the annual report from the manufacturing department, the annual steam cost in 1983 is big at 8,138,351 kg and 167,650,000 RP. A graph on the consumption attached at the end of this chapter should be referred to and the control should be intensified.

2) Electric energy control

(1) The pulp and paper industry is one of the typical process industries and the consumption of the electric energy as its power source is big, and in the case of PPM, the unit price per kWh is about 70 Rp and its share in the production cost is big at 5 – 15%.

(2) Recently the oil price is considerably escallated in Indonesia despite the fact that it is one of the oil producing countries and for this reason the electric charges are also rapidly escallated.

(3) The power consumption in PPM in 1983 is big at 12,861.3 MWh and 90,029,000 Rp/y.

(4) The energy saving through the control of the electrical equipment includes the power factor improvement.

(5) Also there is an energy saving policy which requires equipment improvements such as reduction in friction loss of rotary section of machinery and equipment, and switching to the equipment with higher efficiency, thus can also be able to improve the total power consumption.

(6) A graph on the consumption attached at the end of this chapter should be referred to and the control should be intensified.

3) Control of mill water, effluent and piping system

(1) The pulp and paper factory cannot be built at a place without water. The control of the water is very important because improper control of it will cause variation in product quality and may result in credibility problem with the users.

(2) Even if a water source is secured, it will be nonsense if it is not a stable water source for the main purpose of paper making.

(3) The elevated mill water tank should be used for stabilizing the water pressure and the periodic maintenance cost is to be considered.

(4) The effluent treatment is required for protection of the social environment and reduction of flow loss of the material.

(5) The environmental regulations now in force are severe. But PPM is protected by the local law. However, if the investment is neglected for taking advantage of the protection, the low total yield cannot be improved.

(6) It is of course necessary to try to recover the effluent after discharging it outside the system, but efforts should be made to intensify the maintenance of each process and to minimize the discharge from each section.

(7) It is effective small group activities for everyone to propose improvements on the cost reduction through the daily inspection of water and effluent and try to make an efficient investment.

5-5 Purchasing Control

If one-sided control is enforced too vigorously, it often tends to result in bargain hunting by paying little heed to the quality of purchased goods. Cost reduction can also be effected, however, by using material of good quality in as little quantity as possible (by improving yield). This method will also contribute quality improvement, and, as a result, to reduction of total cost.

In this section, we are giving an outline of, in particular, purchasing control on straw material.

5-5-1 Influence of Purchased Straw Quality against the other Plants

1) Unit Ratio of Steam for Self-made Bleached Pulp

(1) Fig. 5-5-1 attached shows, in graphs, monthly unit ratio of steam consumption in 1983.

(2) The straw harvesting areas around PPM are met by the rainy season from October to March, hence the dry season extends from April to September.

(3) Why is it that unit ratio of steam varies according to the season ? The point to which special attention should be paid, is that variation in such ratio amounts to as much as a little over two times.

As simple factors, this may be attributed to the moisture contents of straw before the loading on tracks from farmhouses, and storage of insufficiently dried straw in the rain. Another contributing factor may be absorption of rainwater in transit.

(4) As corrective measures, in addition to the method of raw straw collecting control as described in Chapter 6, conceivable methods include collecting and storing the material energentically during the dry season and, then, practising vigorously in-plant storage control, among others.

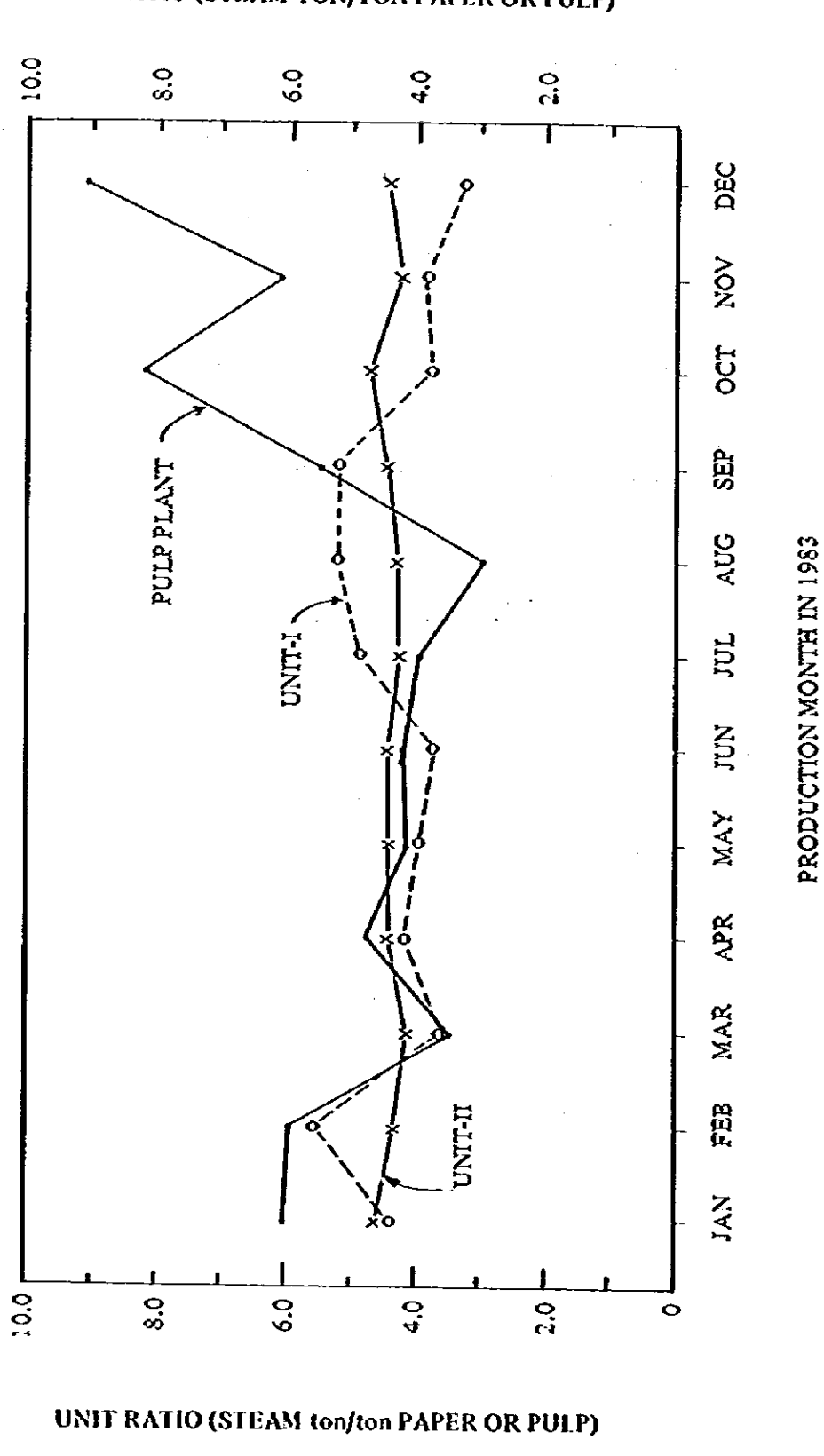


Fig 5.5.1 MONTHLY UNIT RATIO OF STEAM CONSUMPTION IN 1983
FROM ANNUAL PRODUCTION REPORT

(5) It is an obvious fact that the difference in unit ratio of steam shown in Fig. 5-5-1, is attributable to decrease in cooking yield in consequence of deteriorated quality of purchased straw. Thus, this difference is nothing but a result of calculation produced by the fact that pulp output relatively decreased in relation to given steam consumption.

Note: The deteriorated quality of straw means a quality of straw in a state easy to spoil. Straw of this quality loses, under the action of cooking chemicals, its fiber during the ordinary cooking process, and changes the fiber into black liquor to be discharged into effluent as dissolved solid.

2) Calcium Carbonate ($CaCO_3$) and Imported French-Made Cigarette Paper

(1) By the method described in Chapter 6, it would also be possible to produce cigarette paper as good as imported French-made paper.

(2) Specifically, through decreasing blending of Flax and, instead, blending imported French-made $CaCO_3$, it will be possible to produce a kind of paper, porous and with less pinholes, like the French counterpart.

In this respect, a too shortsighted view of cost reduction is apt to "give a wide berth" to the purchase of costly French-made Calcium Carbonate ($CaCO_3$) also from managerial standpoint. In consideration of the recent quality analysis of the French made cigarette paper as well as its prospects in the future, however, it will be necessary, as well as, beneficial to have a try in this direction.

5.6 Operation Control

5.6.1 Formulation of Production Plan

1) Table 5-6-1 Selling Price and Production Cost Actual Results List of February 1984 (Budget table in March for PPM) was attached to the next page.

2) In the project, besides this table, the table showing settlement of account for fiscal 1983, the Production department annual report for fiscal 1983, production plan for March 1984 and annual budget for fiscal 1984 were fully checked up and were the basis of calculation.

3) Table 5-6-1 is called "Budget Statement for March" and its contents were analysed hereunder. Therefore, it is desired that the future production plan after renovation would be applied with this calculation methods.

4) Production Rate

The figure shown here shows the production per operation shift.

(1) Namely, the amount of production designated per shift, so-called "the piecework system" is reminded. Consequently, since the policy which takes precedence of the capability evaluation for each shift is submitted beforehand, the information exchange and communication at the time of the shift change for each shift are hard to occur and further the lateral connection at each plant is liable to be disrupted. The system is close to the contract piecework system depending upon the skilful operators.

When the shift changes, the quality changes accordingly.

(2) From this viewpoint, production should be planned for 24 hours, shift communication and confirmation should be closely made at the time of each shift change and efforts should be made so that the revenue improvement can be grappled in cooperation.

Table 5-6-1 List of Actual Result for Selling Price and Production Cost of Feb, 1984

No.	Product brand			Basis weight (GSM)	Production (AD t/8h)	Yield (%)		Unit price (Rp/kg)		Actual selling price of February (Rp) + 2½ % Ppn	Profit and loss per kg 7 : 8	
						Production on reel	Production finished	Selling price + 2½ % Ppn	Production cost + 2½ %Ppn			
	1	1	2	3	4	5		6 (PER kg)	7 (PER kg)	8 (PER kg)	9 (PER kg)	%
I- 1	H.V.S.. Warna	Printing and Writing Color	65 x 100 = 26 kg	80	3.2	81	80	–	1,237.68	–	–	–
- 2	H.V. Offset		62 x 88 = 16.37	60	3	81	82	893.46	1,246.06	–	–	–
- 3	H.V.S. Putih	Printing and Writing White Color	55 x 75 = 10.31	50	3	81	80	343.38	1,275.67	–	–	–
- 3a	Kertas Water Merk Pth	Water Mark White Color	65 x 100 = 22.75	70	3	80	81	–	1,432.55	682.41	(750.14)	(52.36)
- 3b	Water Merk Warna	Water Mark Color	65 x 100 = 22.75	70	3	80	81	–	1,347.51	716.49	(631.02)	(46.83)
- 4	Cyclostyle Ef	Duplicater	21.3 x 33 = 2.43	69	3.5	84	93	688.22	982.22	703.99	(278.23)	(28.33)
- 5	Zuurfroef		101 x Roll = 140	70	2.5	84	86	–	1,440.49	915.00	(525.49)	(36.48)
- 6	Mail Zegel	Instant mail	61 x 86 = 20.98	80	2.2	90	80	2,208.77	1,508.30	2,175.89	667.59	44.26
- 7	Banderol	Stamp duty	75 x 102 = 22.95	60	2.8	84	87	2,071.20	1,201.74	2,411.78	1,210.04	100.69
- 8	Banderol	Stamp duty	73 x 102 = 18.62	50	2.8	84	87	2,071.20	1,201.74	2,530.27	1,328.53	110.55
- 9	Reform	Drawing	157 x Roll = 9.42	120	3.2	87	84	956.56	1,206.92	1,324.66	117.74	9.76
-10	SPR. Water Merk Ind	Bond Water Mark	67 x 100 = 26.80	80	2.2	90	80	2,186.09	1,645.95	–	–	–
-100	SPR. Biasa	Bond Ordinal type	67 x 100 = 26.80	80	2.2	82	82	2,186.09	1,588.19	2,476.20	888.01	55.91
-11	Cheque Putih	Cheque White Color	65 x 100 = 32.5	100	3.2	84	84	975.24	1,205.18	–	–	–
-12	Ijazah (STTB)	Bond	71.5 x 92.7 = 43.08	130	3	86	50	–	2,403.64	3,283.86	880.22	36.22
-13	Post Wesel	Post Money Order	65 x 97 = 55.17	175	3	84	88	844.90	1,243.30	940.25	(303.05)	(24.37)
-14	Kartu Post	Post Card	60 x 85 = 44.63	175	3	84	88	891.33	1,198.77	844.76	(354.01)	(29.53)
-15	London Warna	London Color	61 x 86 = 49.84	190	3.4	84	84	–	1,238.56	–	–	–
-16	Doorslag Putih	Manifold	44 x 69 = 4.25	28	1.4	82	80	937.43	1,170.39	858.82	(311.57)	(26.62)
-17	Doorslag Warna	Clored Manifold	44 x 69 = 4.25	28	1.4	82	80	–	1,735.50	905.88	(829.62)	(47.80)
-18	Bank Post Putih	Bank Post	65 x 100 = 14.30	44	2	81	82	882.50	1,504.36	–	–	–
-19	Corona	Holy Qur'an Book	46 x 69 = 5.87	37	1.8	82	82	–	1,653.45	–	–	–
-20	Buku Telephone	Telephone Book	62 x 88 = 9.8	36	1.9	82	80	–	1,553.42	–	–	–
-21	Sigaret Putih	Cigarette White Color	46 x 89 = 5.32	26	1.4	76	80	1,221.19	1,783.11	1,303.44	(479.67)	(26.90)
-22	Sigaret Nankin	Cigarette Nankin	46 x 89 = 5.32	26	1.4	76	80	–	1,892.78	–	–	–
-23	Coverture Warna	Packaging Color	65 x 100 = 19.5	60	3	86	88	660.22	629.46	732.66	103.20	16.40
-24	H.V. Omslag	Book Cover	65 x 100 = 26	80	3	84	92	444.80	724.90	452.15	(272.75)	(37.63)
-25	H.V. Omslag	Book Cover	73 x 100 = 87.6	200	3.4	84	92	371.97	667.57	413.80	(253.77)	(38.01)
-26	H.V. Omslag Biru Tua	Book Cover Strong Blue	65 x 100 = 22.75	70	3.2	84	92	302.69	701.11	–	–	–
-27	Kraft Coklat	Packaging Charcoal Colored	90 x 120 = 24.30	45	2.6	84	92	323.86	642.60	–	–	–
-8a	Water Merk	Water Mark	65 x 100 = 32.5	100	2.2	90	80	1,700.23	1,511.75	–	–	–
II- 1	Sigaret GB	Cigaret GB	51 x 76.5 = 5.07	26	440 kg/J	96	88.5	1,371.93	1,540.07	1,562.13	22.06	1.43
- 2	Sigaret SB	Cigaret SB	51 x 76.5 = 5.07	26	431	96	90	1,315.14	1,448.60	1,502.96	54.36	3.75
- 3	Sigaret Eagle	Cigaret Eagle	51 x 76.5 = 5.07	26	400	96	87.5	1,809.63	1,851.64	2,021.70	170.06	9.18
- 4	Sigaret Coklat	Cigaret Charcall	51 x 76.5 = 5.07	26	400	92	87.5	1,712.96	2,239.95	2,268.24	28.29	1.26