



Western Michigan University  
**ScholarWorks at WMU**

---

Paper Engineering Senior Theses

Chemical and Paper Engineering

---

4-1975

## An Examination of Paper Manufacture Quality Control Methods and How They Effect Consumer Complaints

Ian R. Paisley  
*Western Michigan University*

Follow this and additional works at: <https://scholarworks.wmich.edu/engineer-senior-theses>

 Part of the Wood Science and Pulp, Paper Technology Commons

---

### Recommended Citation

Paisley, Ian R., "An Examination of Paper Manufacture Quality Control Methods and How They Effect Consumer Complaints" (1975). *Paper Engineering Senior Theses*. 402.  
<https://scholarworks.wmich.edu/engineer-senior-theses/402>

This Dissertation/Thesis is brought to you for free and open access by the Chemical and Paper Engineering at ScholarWorks at WMU. It has been accepted for inclusion in Paper Engineering Senior Theses by an authorized administrator of ScholarWorks at WMU. For more information, please contact [maira.bundza@wmich.edu](mailto:maira.bundza@wmich.edu).



AN EXAMINATION OF PAPER MANUFACTURE QUALITY  
CONTROL METHODS AND HOW THEY EFFECT  
CONSUMER COMPLAINTS

by

Ian R. Paisley

A Thesis submitted to the  
Faculty of the Department of Paper Science and Engineering  
in partial fulfillment  
of the  
Degree of Bachelor of Science

Western Michigan University

Kalamazoo, Michigan

April, 1975

## ABSTRACT

Information gathered by means of a consumer survey indicates that the majority of problems affecting roll runnability are caused by employee work habits and supervision, rather than machinery, during the manufacture of a roll of paper.

A second survey, in the form of a three-part questionnaire, was sent to mills in the United States and Canada, producing newsprint, fine paper, groundwood printing and specialty papers. The survey obtained information about testing and supervision procedures plus the formal training of those responsible for quality control. The conclusions indicate that the lack of professional training may contribute to potential customer complaints.

## TABLE OF CONTENTS

	PAGE
INTRODUCTION . . . . .	1
LITERATURE SURVEY. . . . .	2
HISTORICAL BACKGROUND AND DEVELOPMENT OF THE PROBLEM . . . . .	4
Printers Survey . . . . .	4
Questions . . . . .	4
Replies . . . . .	4
Fine Paper Printers . . . . .	7
Groundwood and Specialty Printers . . . . .	7
Conclusions . . . . .	7
PROCEDURE. . . . .	8
Preparation of the Questionnaire for Paper Mills. . . . .	8
Part A-Papermaking Evaluation . . . . .	8
Part B-Slitting and Rewinding . . . . .	8
Part C-Wrapping, Storage and Shipping . . . . .	9
DISCUSSION OR RESULTS . . . . .	11
Return Success. . . . .	11
Analysis of Returns . . . . .	11
Part A-Papermaking Evaluation . . . . .	11
Part B-Slitting and Rewinding . . . . .	12
Part C-Wrapping, Storage and Shipping . . . . .	14
CONCLUSIONS. . . . .	15
RECOMMENDATIONS. . . . .	17
BIBLIOGRAPHY . . . . .	18
APPENDIX . . . . .	20

## INTRODUCTION

Traditionally, the factors affecting web runnability have been approached by the detailed examination of specific and recognized mill tests that have a bearing on roll performance. This paper represents an attempt to go beyond this classical approach, to find out some of the other causes of poor runnability created at the manufacturing level.

## LITERATURE SURVEY

The literature, as a primary source of information, yielded a lengthy list of sheet properties that contribute to roll runnability. Some of these were moisture, basis weight profile, tensile, caliper and the many factors that go into the winding of a reliable roll. The foregoing physical aspects of papermaking appeared to be constantly researched and examined by members of the paper industry. Hazelwood (10) examined the development of the Beta Gauge and what it measured. Delaunoy (13) discussed the work done to improve paper flatness through electrostatic moistening of kraft and coated papers. However, both these papers failed to mention that the effectiveness of these instruments depended on the actual operator and his monitoring of the information produced.

Merrick and Massey (3) discussed the utilization of dynamic caliper measurement on a paper machine. They reviewed the use of an instrument system based on an operating principle of variable reluctance. At no point did they mention that oversize caliper paper, if not spliced out by the operator at the rewinder, could cause folder or binding difficulties for the future consumer.

Rand and Erickson (6) analyzed theoretically and experimentally the stresses in large newsprint rolls created during mill winding. The fact that these internal stresses caused web rupture during printing and must be removed or improved by a mill operator was not mentioned.

It soon becomes evident that the mechanical control of the foregoing physical properties resulting from industry wide research has improved markedly. However, there was nothing to indicate what was being done by the industry to research and improve the human factor. This element, when applied, establishes the degree of success of all the preceding mechanized control used during the manufacturing process.

## HISTORICAL BACKGROUND AND DEVELOPMENT OF THE PROBLEM

### Printers Survey

A second source of information examined was the web printer. It was thought that the more efficient, technical-minded printing plants could well have certain mill-test results or specifications that they considered to be good indicators of a roll's runnability.

The selection of a survey sample of printers was made from those having medium to large plants and from plants where the researcher, during the past twelve years of sales experience, had formed a good rapport with knowledgeable members of the production staff.

The sample was composed of newsprint, fine paper and groundwood and specialties\* consumers.

The newsprint group consisted of eight daily newspapers, ranging from three of the largest dailies in the midwest to a paper with a daily circulation of 30,000.

Included in the fine paper group was the largest producer of continuous forms, a book publisher and a printer of coated advertising brochures. In all, five plants were contacted.

The largest consumer of catalog and directory stock and the largest producer of catalogs were two of the four plants contacted in the groundwood and specialties section.

---

\*Glassine, corrugating medium, board and kraft.



A standard set of questions was prepared and asked of all the printers contacted in the initial survey.

### Questions

1. What specific runnability problems are encountered?
2. What is the frequency of their occurrence?
3. What degree of importance are these problems assigned on a cost basis?
4. Does the customer have any definite incoming quality control procedures? If so, what tests are performed to predict runnability?
5. What sheet properties best improve runnability?
6. What procedures, if any, do you have for reporting paper defects to the manufacturer?
7. Does your firm have any specific plans now, or for the future, to establish a formal method of working with a mill to attempt to reduce paper defects?

### Replies

Newsprint Users - The above questions were first posed to the newsprint section. The responses were identical for each member of the sample. Briefly, the printers indicated that the short supply of newsprint at the time of the survey (October, 1974) had removed all but minimal quality checks on incoming mill shipments; that is, their need for material, which at the time was in short supply, resulted in only cursory inspection upon

its receipt. All these plants reported an increase in web breaks.

Investigations of the break causes by the newspaper production departments indicated that the steep rise was due to faculty mill workmanship rather than poor paper machine operation. The technical people consulted were positive in their agreement that the recent industry-wide basis weight reduction to 24 x 36 - 30# had not been the complaint-rise contributor. To the contrary, it was felt that mullen, tensile, porosity, surface smoothness and furnish cleanliness were reliable.

The newspapers described, as a common occurrence, pieces of scrap paper between the roll plies. Excessive slitter dust and slime holes were other problems believed, by the respondents, to be an indication of lax mill inspection procedures. Poor application of the web to the core caused the rolls to telescope or the cores to break loose, thereby making it impossible to apply good press tension control. Splicing glue or tape adhering to adjacent plies, was another very common press operator complaint. Poorly applied edge protection during wrapping contributed to increased roll damage. One very large newspaper's production manager commented that the use of flying pasters was often discontinued because the rolls had edge cuts or excessive wrapper glue, which made successful pastes almost impossible. Loose winding and varying roll hardness were also unanimously cited. Roll labeling and little or no application of splice indicator arrows to warn pressmen of pending splices, had noticeably diminished. These were the major faults, all of which represented workmanship rather than structural faults.

Transit damage, on the other hand, was reported to be declining slightly due to the increased web of trucks over rail.

#### Fine Paper Printers

This group listed complaint causes that paralleled those of the newspaper group plus the additional problem of slitter dust and other dirt specks that had not been properly vacuumed or culled at the mill.

#### Groundwood and Specialty Printers

A list of problems identical to those cited by the other two groups was given. The users of coated groundwood stock reported that additional calendar faults were compounding their problems. These, it was felt, should have been rejected before leaving the mill.

#### Conclusions

The conclusions drawn from this consumer survey were:

1. The major physical sheet properties affecting runnability were being adequately controlled and improved in the mill through the industry's technical efforts.
2. The cause of increased runnability problems appeared to be one of people, not machines.

The area of runnability problems was defined as that which resulted in costly, lost press time.

## PROCEDURE

### Preparation of the Questionnaire for Paper Mills

To learn more about the technical expertise and quality control applied to various stages of the paper manufacturing process and how they related to the conclusions drawn from the consumer survey, a three-part questionnaire (Exhibit A) was designed and sent to a select sample.

### Part A - Papermaking Evaluation

This part of the questionnaire was aimed at that portion of the paper manufacturing process up to and including the machine winder. The information sought included such items as the professional training of those directly responsible for supervision; what tests were used by the control departments to predict runnability; how often these tests were used; what, if any, test or tests aided strongly in evaluating a roll's press potential. By asking about complaint procedures, it was hoped that a correlation might emerge between a mill's attitude towards complaints and workmanship at the operator level.

### Part B - Slitting and Rewinding

An attempt was made here to zero in on that part of the process having the least amount of quality control automation. This area relied heavily on the work habits of the individuals involved. Most of the runnability complaints referred to in the consumers' survey originated here.

By listing the separate manufacturing steps where complaints originated, and asking for some indication of the frequency with which these were monitored, it was hoped to learn of a possible relationship between limited professional training and complaints.

This section also included questions asking for complaint handling procedures.

### Part C - Wrapping, Storage and Shipping

The finishing process again relied heavily on the individual's performance. A list of final steps in the manufacturing procedure, that result in the completed roll, was presented in Part C. Additional emphasis was placed on learning the extent of control in these areas. Questions were asked concerning professional training and supervision, and the formal complaint handling procedures.

A covering letter was directed to one person within the mill who, it was hoped, would act favorably and promptly. In most cases a Paper Science and Engineering graduate was sought within a mill whose position enabled him to oversee the distribution and completion of the three-part questionnaire.

The letter asked that each part be completed by that person directly responsible for the day-to-day control procedures. It was hoped to reach the foremen of these separate areas-that person with the immediate responsibility.

The mailing list consisted of mills in Canada and the United States.

The numbers in each category were as follows:

Newsprint	17
Fine Paper	33
Groundwood & Specialties	<u>6</u>
Total	56

Two weeks after the initial mailing, a follow-up letter (Exhibit B) was sent to those mills which had not yet replied.

## DISCUSSION OF RESULTS

### Return Success

Of the 56 separate mailings, four destinations were disqualified because of the Ontario mill strike. Thirty-five mills returned all three completed parts resulting in an overall return success of 56.45%.

The percentage response by individual sample categories was:

Newsprint	38.5%
Fine Paper	60.6%
Groundwood & Specialties	68.7%

### Analysis of Returns

#### Part A - Papermaking Evaluation

Examination of Part A replies showed that care and consideration had been taken in completing the form. 81.8% of all replies indicated a professional engineering background of the supervisory staff directly responsible for quality control.

A 01.5% use of all standard tests including basis weight, moisture, caliper, mullen and tear, was indicated by the 41 mills replying to Part A of the questionnaire. However, no individual test was considered to be a standout indicator of runnability. Tensile and internal bond testing was done by only 15%.

Not only were the standard tests being used, but they were being used with an organized frequency. The responses here were varied - "each reel," "all the time," "each swing up," "each log," "on line-continuous,"

"computer-continuous." However, though varied, these responses all indicated a systematic persistence.

Basis weight and moisture were continually monitored by:

Newsprint mills	83.3%
Fine Paper mills	62.0%
Groundwood & Specialty mills	38.0%

Five of the mills reported computerized control to be in effect.

In Part A, that section directly concerned with the handling of customer complaints (see question 11 of Exhibit A-Part A) received very positive attention. The indication was of strong, well-established procedures such as the examination of machine logs and careful test analysis of defective production. The newsprint mills were significantly more detailed and elaborate in their replies describing their complaint handling procedures.

#### Part B - Slitting and Rewinding

The replies in this section were less carefully completed. Answers to the questions were not as definitive and informative. The percentage of professionally trained supervisors was:

Newsprint	0%
Fine Paper	39%
Groundwood & Specialties	27%

The replies to the various subitems of question 2, (that section concerned with potential defect occurrence) were such that it was difficult to trace a pronounced trend.



The three types of mills reported definite steps for testing the relative humidity of paper and, 76% indicated the use of automatic void detection equipment.

Responses to the next items (splicing procedures, slitting knife maintenance, core starts and tension control during roll building), were such as to indicate absolutely no uniform approach by the majority of mills. The range of monitoring these very critical areas went from "every reel" to "when trouble occurs." The majority of mills reported that inspection was done on an "as needed" basis. Tension control during roll building (item 2F) had no pattern of quality control at all.

Question 3 (what other tests or procedures, that might reduce runnability complaints, would you like to see performed?) produced a variety of responses. Most frequent were requests for more audit inspections and, in the newsprint section, a number suggested that hardness testing equipment and a method for splice checking would be useful. The groundwood coated group were unanimous in replying that they were testing adequately.

Questions 4 and 5, dealing with complaint reporting and handling procedures, were answered much more casually in comparison with replies to related questions in Part A. All mills reported the existence of some formal investigative procedures. However, only 32% indicated that the treatment of complaints was used as an educational tool to improve efficiency rather than a routine, somewhat mechanical system.

### Part C - Wrapping, Storage and Shipping

This section was completed with more care than Part B but less than Part A.

17% of the Newsprint mills reported professionally trained supervisory staff; 21% for the Fine Paper mills and 9% for Groundwood and Specialties.

Items 2a and 2c (core plug applications and roll wrapping and labeling) could be classified as secondary contributors to web breaks, as they make the roll more vulnerable to handling and transit damage. These areas indicated no set pattern of supervision. The percentage breakdown between continuous monitoring, defined as "once a set" and "casual" (meaning less than once per shift) was:

Newsprint	50% casual supervision
Fine Paper	63% casual supervision
Groundwood & Specialties	82% casual supervision

In the loading procedures and shipping vehicle condition inspection categories, the results were very positive and showed 90% of all mills as having continuous supervision.

The complaint section of "Wrapping, Shipping and Storage" revealed a much stronger participation in the investigation and reply to formal complaints than did slitting and rewinding. However, the trend was much less than that indicated in Part A.

## CONCLUSIONS

The trends displayed throughout this survey support the conclusion made earlier from the initial Consumer Survey - that increased runnability problems appear to be people, not machine oriented.

In the area of sophisticated machinery, that is, the actual paper-making process, quality control was rigid, organized and systematically administered by, for the most part, professionally trained personnel.

In the areas of Slitting and Rewinding, Wrapping Storage and Shipping, the human element comes more obviously into the operation. The less sophisticated equipment and automated control places the quality results at the mercy of an operators personal work habits.

Further and more extensive testing would be required to determine the true effect of professional versus non-professional supervisory staff on the success of effective quality control.

In any study of this kind, the effectiveness of the questionnaire is a very critical factor. In the areas of quality control procedure, this survey brought forth very general information without the detail desired.

The asking for the specific educational background of those completing the forms appeared to have caused many to take offense. This could have been a major factor in the poor number of returns. Conversely, this very lack of professional training becomes evident in the way the various parts were completed. This is a significant point that the survey

illuminates. The slitting and rewinding steps in the manufacturing process are where most runnability complaints originate. The evidence suggests that the lack of professionalism may contribute to these complaints.

However, despite the obvious shortcomings of the questionnaire design, the trend is still evident-that the cause of the increased runnability problems could be attributed to people rather than machines.

## RECOMMENDATIONS

This survey, to a limited degree, has revealed that the scientific approach to controlling the variables that affect the runnability of a roll of paper has been increasingly effective on the paper machine. It may not be time for a concentrated examination of the human factor and how best to reduce the obvious problems that this element is causing.

A detailed and probing industry study would be required to more accurately obtain the breadth and depth of this problem.

A portion of the capital that is being spent on instrumentation research and process control to the machine winder should now be diverted in an attempt to minimize this largely neglected area.

A careless or haphazard approach by an employee or supervisor can very quickly and simply nullify the benefits gained through the most careful technical control.

## BIBLIOGRAPHY

1. Morris, C. V.  
Understanding the Problems of Roll-Papers On-Press Web Printer, No. 13, 171, p 6, (4p).
2. Miller, L. and Springer, G.  
A New-On-Line Caliper Gauge, Tappi Vol. 56, No. 2, Feb. 1973, (p. 45-47).
3. Merricks, J. A. and Massey W. M., Jr.  
Utilization of Dynamic Measurement of Caliper on a Paper Machine, Tappi Vol. 56, No. 2, Feb. 1973, (p. 83-86).
4. Factors Affecting Paper Runnability, Printing Trade Journal, No. 988, 55-6, June, 1969.
5. Bureau, W. H.  
Static Electricity: Friend or Foe?, Graphic Arts Monthly, 44, No. 9: 106, 108-9, No. 10, 108-11, (Sept.-Oct. 1972).
6. Rand, T. and Erickson, L. G.  
Physical Properties on Newsprint Rolls During Winding, Tappi Vol. 56, No. 6, June 1973, p. 153, (4p).
7. Anon  
Why Paper Won't Stay Put, Printing World, Vol. 91, No. 25, Dec. 20, 1972, p. 564, (1p).
8. Byers, N.  
Handling Coated Papers, Part I, Graphic Arts Monthly, Vol. 44, No. 12, Dec. 1972, p. 74, (3p).
9. Campbell, J.  
Suddenly, Paper Runs Better for Offset Daily, Printing Managements, Vol. 101, No. 4, Jan. 1971, p. 54, (1p).
10. Hazelwood, E.  
What the Beta Gauge Measures, What are its Limitations, Paper Trade Journal, Aug. 6, 1973, p. 33-38.
11. Beyne, H.  
Papers: Their Adaptation to the Printing Press, A.T.P., Rev. 25, No. 1:21-8, 35-46, 197- , (FR).

12. Paasche, P.  
Problems of Printability of Papers During Letterpress Printing,  
Papier Druck, 20, No. 3, 37-40, No. 4, 57-60, March-April, 1971,  
(GER).
13. Delaungy, M.  
Improving Flatness of Paper Through Electrostatic Moistening,  
Papier, Carton Cellulose 21, No. 4, 42-5, April, 1972, (FR).
14. Verschuur, A. C.  
Processing Problems in Web Offset Printing as a Result of  
Out-of-Round Paper Rolls, I.G.T.-Nieuws, 24, No. 3, 34-7,  
1971, A.B.I.P.C. 42, abstr. 10052.
15. Lyne, L. M.  
The Use of Tappi Standard and Routine Control Methods by  
Paper Coating Mills and Converting, Tappi Progress Report  
on C. A. 1053.

APPENDIX



**WESTERN MICHIGAN UNIVERSITY**

COLLEGE OF APPLIED SCIENCES  
Department of Paper Science & Engineering

616 383-1804

KALAMAZOO, MICHIGAN  
49008

## EXHIBIT A

Dear

The enclosed survey is intended to obtain a cross section sampling of mill attitudes towards paper testing, roll building and roll handling as they relate to runnability in web-fed printing processes. A preliminary survey of printers and publishers indicated a need to delve into some "Post Manufacturing" areas not usually considered in a survey of this sort.

Since this survey is being conducted as a senior thesis project, we must have all returns by February 28, to allow completion of the survey within the winter term 1975. Your prompt cooperation will be greatly appreciated.

Please be assured that all information obtained will be treated with strictest confidence and only averages and trends which will not reveal individual mill positions will be made public.

Thank you for your time and interest in making this a worthwhile survey.

Sincerely,

James E. Kline  
Associate Professor  
Department of Paper Science  
and Engineering

JLK/slw  
Enclosure

# **WESTERN MICHIGAN UNIVERSITY**

COLLEGE OF APPLIED SCIENCES  
Department of Paper Science & Engineering

616 383-1804

KALAMAZOO, MICHIGAN  
49008

February 24, 1975

Mr. H. G. Ingram  
Technical Director  
Spruce Falls Power and Paper Company Ltd.  
Box 100  
Kapusking Ontario  
Canada

Dear Mr. Ingram:

As yet we have not received your replies to our questionnaire.  
If at all possible we would appreciate receiving them within the  
next few days.

Thank you for your cooperation.

Sincerely,

James E. Kline  
Associate Professor  
Department of Paper Science  
and Engineering

JEK/slw

GENERAL INSTRUCTIONS FOR COMPLETION

The accompanying survey has three parts that correspond to the following areas of the manufacturing process.

Part A - Papermaking Evaluation

Part B - Slitting and Rewinding

Part C - Wrapping, Storage, and Shipping


It is very important that the above sections be completed by the person directly responsible for the day to day control procedures in each of the three separate areas.

Each section of the questionnaire has a self-addressed, stamped envelope attached to it. The individual completing each part can then mail it directly to us.

Thank you and your associates for your cooperation.

James E. Kline  
Associate Professor

Department of P Science and  
Engineering

  
Ian R. Paisley  
Senior Thesis Student  
Department of Paper Science  
and Engineering

# PAPERMAKING EVALUATION

PART

Tests applied during manufacture to predict WEB-RUNNABILITY

A

Mill: \_\_\_\_\_ Location: \_\_\_\_\_

Grade(s): \_\_\_\_\_

Department responsible for quality control in this area: \_\_\_\_\_

Questionnaire completed by: \_\_\_\_\_ Position: \_\_\_\_\_

Formal Training: \_\_\_\_\_

	Used	Not Used	Frequency
1. Basis Weight (non-instrumental) Basis Weight Profile			
2. Moisture (non-instrumental) Moisture Profile			
3. Caliper (non-instrumental) Caliper Profile			
4. Mullen			
5. Tear			
6. Tensile			
7. Internal Bond (which test machine or method)			

8. Other tests you use: \_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_

9. Which of the above are considered most reliable? \_\_\_\_\_

10. What other tests would you like to have performed? \_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_

11. How are customer Runnability Complaints brought to your department's attention?  
\_\_\_\_\_  
\_\_\_\_\_

Any additional comments may be continued on the back.

PLEASE RETURN IN ATTACHED, READY TO MAIL, ENVELOPE, AS SOON AS POSSIBLE.

THANK YOU.

# SLITTING AND REWINDING

PART

Tests and QUALITY CONTROL procedures applied to improve WEB-RUNNABILITY

B

Mill: \_\_\_\_\_ Location: \_\_\_\_\_

Grade(s): \_\_\_\_\_

Department responsible for QUALITY CONTROL in this area? \_\_\_\_\_

Questionnaire completed by: \_\_\_\_\_ Position: \_\_\_\_\_

1. What formal training do those responsible for the supervision of this area have?

\_\_\_\_\_

2. POTENTIAL DEFECT OCCURANCE	DEGREE OF INSPECTION BY SUPERVISION		
	Every Reel	Once per Shift	How Often
a. Relative humidity of paper _____			
b. Void detection method _____			
c. Splicing procedures _____			
d. Slitter knives (frequency changed) _____			
e. Core starts _____			
f. Tension control during roll building _____			
g. Calendar tension controls _____			
h. Tensile _____			
i. Caliper _____			
j. Other tests performed _____			

3. What other tests or procedures, that might reduce runnability complaints, would you like to see performed? \_\_\_\_\_

\_\_\_\_\_

4. Is your department informed regularly of FORMAL COMPLAINTS due to problems emanating from your area? \_\_\_\_\_

5. How, or to what extent, does your department enter into the investigation of such complaints? \_\_\_\_\_

\_\_\_\_\_

Any further comments you may have concerning the relationship between your department and paper-performance may be included on the back.

PLEASE RETURN IN ATTACHED, READY TO MAIL, ENVELOPE, AS SOON AS POSSIBLE.

THANK YOU.

# WRAPPING, STORAGE, SHIPPING

PART

Tests and QUALITY CONTROL procedures applied to improve WEB-RUNNABILITY

C

Mill: \_\_\_\_\_ Location: \_\_\_\_\_

Grade(s): \_\_\_\_\_

Department responsible for QUALITY CONTROL in this area: \_\_\_\_\_

Questionnaire completed by: \_\_\_\_\_ Position: \_\_\_\_\_

1. What formal training do those responsible for the supervision of this area have?

\_\_\_\_\_

2. POTENTIAL DEFECT OCCURANCE

DEGREE OF INSPECTION BY SUPERVISION

	Every Roll	Once per Shift	How Often
--	---------------	-------------------	--------------

a. Core plug applications _____			
b. Roll identification marking procedure _____			
c. Roll wrapping and labelling procedure _____			
d. Clamp truck jaw pressures _____			
e. Shipping vehicle condition (cleanliness, nail free etc.) _____			
f. Loading procedures _____			
g. Other areas your company monitors _____			

3. What other procedures or tests, that might reduce runnability complaints would you like to see performed? \_\_\_\_\_

\_\_\_\_\_

4. Is your department informed regularly of formal complaints due to problems emanating from your area? \_\_\_\_\_

How, or to what extent, does your department enter into the investigation of such complaints? \_\_\_\_\_

Any further comments you may have concerning the relationship between your department and paper-performance may be included on the back.

PLEASE RETURN ATTACHED, READY TO MAIL, ENVELOPE, AS SOON AS POSSIBLE.

THANK YOU.