The Economics of Forming Fabric Operation

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INTRODUCTORY ANNOUNCEMENT

United Wire Ltd. has been a regular supplier of metal wires to the Indian Paper Industry for many years.

With the rapid advancement in forming fabric development, however, we have become convinced that most machines throughout the world will eventually become converted to fabric operation.

We are also convinced that the attention that each machine requires when changing from metal wire to fabric operation and the subsequent supply and technical service requirements are best satisfied by local resources. It has therefore been our wish in the Indian Paper Industry to have the opportunity of transfering the technology required to manufacture and service forming fabrics to a domestic supplier with good facilities and reputation. I am happy to announce that we have now entered into an agreement with Shalimar Wires and Industries Ltd. To transfer the technology required to manufacture and service forming fabrics in the Indian market.

In the short term we will support Shalimar Wires and Industries Ltd. by assiting in the change-over from metal to fabric in many mills, and having our own personnel available for technical and commercial discussions, and for start-up assistance. In the longer term, we are obliged to maintain a steady stream of information and help which will enable your domestic producer to supply the most up-to-date product available.

ECONOMICS OF FABRIC OPERATION

There are many advantages available from the use of synthetic forming fabrics, the most obvious of which is available running time (life)-it is very common for a forming fabric to run in excess of ten times bronze wire life and this has great economic advantages. For example, A fabric normally costs approximately two and a half times as much as a metal wire but with a running time of only five times wire life, wire costs

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will have halved. Even more significant are the effects of the reduction in machine downtime for wire changes-for example, imagine the financial rewards of only having to shut the machine four times a year instead of thirty or forty times a year for wire changes.

Fabric technology is advancing very rapidly, and by careful selection of fabric weave patterns, yarn geometry, and finishing methods it is possible to produce additional benefits in terms of improved formation, wiremark, retention, increased machine speed and so on. To realise the benefits obtainable from fabrics on a given machine, it is firstly important to make a complete study of the machine characteristics to identify where the opportunities exist for proved machine performance. These are obviously dependent upon where restrictions occur to prevent better operation, and these vary from machine to machine.

As mentioned previously, the main capacity restriction or "bottleneck" may well be that frequent wire changes due to wire wear, edge cracks, or seam failures cause excessive downtime, but this is easily overcome with fabrics. Another very common bottleneck involves drainage capacity on the machine coupled with fines or filler retention, considerations which prevent the machine from running at a higher production speed. Fabric design can be a great factor in over coming these problems, and if combined with modern dewatering elements, for example Hydrofoils, great improvements can be achieved in machine production rates and paper quality. I do not intend to go into great detail in the field of Hydrofoil Technology, since I am sure aspects of this will be coveredd uring the conference, but dewatering technilogy is part of the know-how which is being transferred to Shalimar.

When converting a paper machine from metal wire to forming fabric operation, there are some machine conditions which have to be met-for example wooden suction box covers must be changed to plastic or ceramic covers, and the financial implications of these changes must be considered as an investment that the paper mill must make to reap the large scale benefits of fabric operation.

My colleague, Mr. MacDonald, made a presentation at the W. Region Seminar in Bombay, describing the machine changes necessary upon converting from metal to fabric operation and copies of his paper are available for those of you who were not at Bombay. Also presented was a paper dealing with fabric design and operation and copies of this are also available. A typical cost and profit analysis of a Paper machine converted from matal to fabric usage is demonstrated in this example.

1. COST SAVING DUE TO REDUCED CLOTHING COST

Bronze Wire Life	=	20 days
No. of wires per year	=	18
Wire cost	=	$ 2500
Wire Cost Per year	=	$ 45000
Average fabric life	=	100 days
No. of fabrics per year	=	4
Fabric cost	=	$ 6000
Fabric cost per year	=	$ 24,000
Reduction in clothing cost	=	$ 21,000

2. INCREASED REVENUE FROM DOWNTIME REDUCTION

No. of wire changes per year	=	20
No. of planned maintenance shuts per year to include all fabric Changes	=	8
Shutdowns saved	=	12
Average time for wire change	=	6 hours
Tons/hour Production	=	2
Increase in production	=	12 x 6 x 2
	=	144 tons
Selling price	=	$ 520/ton
Increased sales revenue	=	$ 74880

The increased production will be at gross margin, therefore only the furnish and variable costs will be deductible

Estimated increased profit	=	$ 30,000

3. INCREASE IN MACHINE SPEED

As a result of conversion to fabric operation coupled with new dewatering equipment, a production increase of 5% was obtained on this machine due to increased speed and reduced quality control rejects.

Wire-tons saleable paper made per year	=	16000 tons
Fabric-tons saleable paper made per year	=	16800 tons
Increase in production	=	800 tons
Selling price	=	$ 520/ton
Increased sales revenue per year	=	$ 416000
Estimated increased profit per year	=	$ 166,400

4. TOTAL INCREASED PROFIT PER YEAR = $ 217,400

5. COST OF CAPITAL EQUIPMENT

Hydrofoil equipment (Forming board, 2-5 blade)		
Foil units, 1-5 vacuum foil	=	$ 42,000
High pressure shower equipment	=	$ 4,500
3 suction box covers	=	$ 1,500
Total	=	$ 48,000
Pay back period	=	3 Months

This is an example of the financial benefits obtainable from this type of conversion, and the figures relate to a 4.0 metre wide mg kraft machine running at 250 M/min.

The capital equipment necessary to successfully run fabrics will off-cou rsevary from machine to machine and there are many examples where no

changes have been necessary in order to obtain the benefit of longer clothing life and reduced downtime due to wire changes.

I hope that this brief introduction to the commercial aspects of forming fabrics operation has whet the appetites of the conference delegates for the papers to come which no doubt will clarify some of the more technical aspects of paper machine operation. However, no matter how advanced a product is technologically, its use must be financially quantifiable, and I personally feel that the conversion of metal wire to forming fabrics is one of the easiest economically justifiable decisions that a paper mill can take.