Dow Jones Reduces Downtime and Wasted Paper With Tension Measurement Devices

The Dow Jones printing plant in Chicopee, Massachusetts has substantially reduced downtime and wasted paper by using tension measurement devices to eliminate paster breaks. In the past, problems with breaks at seams between rolls and broken blankets on Goss Newsliner four-color tower units caused hours of downtime nearly every night. *"We felt that problem was probably tension-related but had no way to determine where the high tension was occurring or what was the cause,"* said Darin LaFave, Production Manager for the Chicopee plant. *"When Goss introduced us to a tension measurement system, we installed it temporarily to get a handle on what was going on. We immediately identified extreme tension of up to 250 pounds in certain areas. We made adjustments to bands, nips, trolleys, and changed blankets and our problems went away. We decided to permanently install the measurement device from Dover Flexo Electronics (DFE) because we discovered that tension continually varied due to press setup, roll conditions, maintenance issues, etc. Now we receive direct feedback that helps us set up our equipment to maintain tension at proper levels."*

TI5 Left-Right-Total Tension Indicators

Dow Jones & Company experienced a production milestone when it ran the first full color advertisement for Cadillac in October, 1995. After much research, the company chose Goss four-color equipment for its Chicopee and South Brunswick plants, half-decks for its other Goss plants, and TKS half-decks and M-72 units for its TKS plants. More recently, the company added two 4/4 towers to each of its existing 10 Goss and nine TKS presses at 17 locations throughout the county. The other aspect of the press expansion and upgrade was to unify the press configuration of all 19 presses, some of which had a different number of units and different angle bar configurations. Having the same configuration on all its presses overcame limitations in section splits and the color positioning in The Wall Street Journal that had previously restricted the paper's flexibility to whatever the least capable press could turn out.

Maintaining acceptable tension is difficult

The Chicopee plant, for example, runs two press lines with 14 units each, both of which are capable of running twelve sheets, turning out about 60,000 copies per hour. Each line consists of 10 mono units, two headline offset satellite units, and two Global Newsletters that were added to provide four-color capabilities. *"When you stack this many units on top of each other, maintaining acceptable tension levels is always a challenge,"* LaFave said. The problems in the past typically came when the press encountered the pasters used to splice one roll to the next. Often the pasters would pull apart at the seam, and this often smashed the press blankets. On certain days, the plant would smash six press blankets in a single night, at a cost of $180 each. But that was the smallest part of the problem. Each time a blanket was damaged, it took a couple of hours of downtime to replace it and get the press running smoothly again. This included approximately 20 minutes of running to get back into registration after the repair, consuming a large amount of paper. Depending on the time of the break and the edition that was

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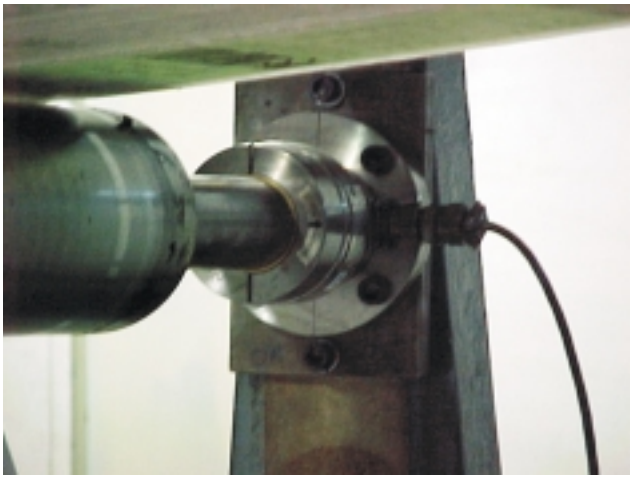
being run, early dispatches were sometimes affected.

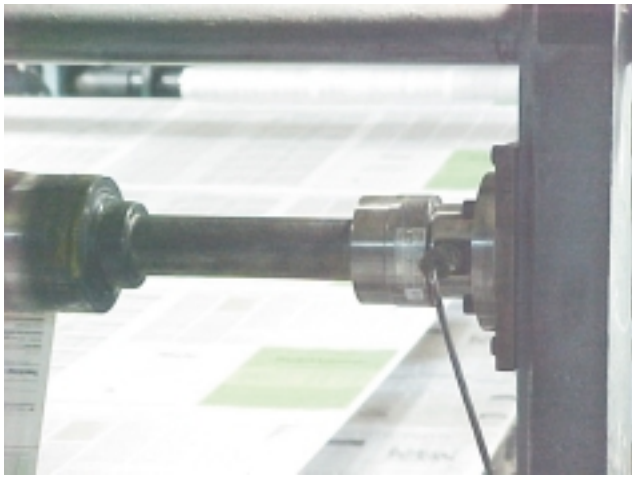
Trial and error was the only tool available in the past to address tension problems. Plant personnel tried different settings for each of the many adjustments on the press as well as different types of blankets but no combination worked consistently over time. *"There's no visual way to determine the tension of a sheet of paper so we had to operate strictly on a trial and error basis,"* LaFave said. *"Each of our operators had different opinions on what was likely to work best. We tried more and less aggressive blankets and different feeds on different levels of the press. Sometimes we thought we had made improvements only to have things suddenly go bad. The problem is that there are so many variables involved that even when we thought we had fixed the problem we didn't have any idea which of the different things we had tried had made the difference."*

Finding the right measurement device



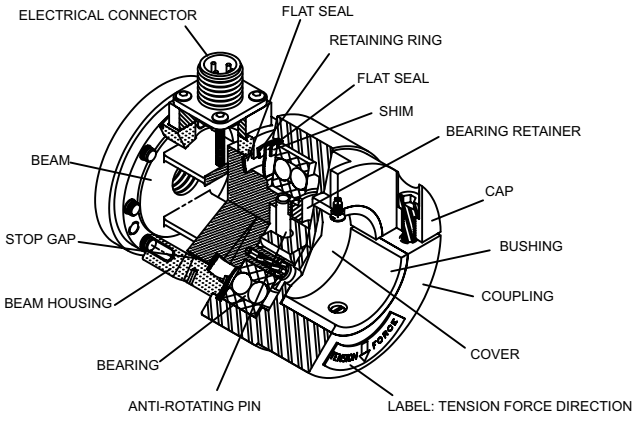
Model C tension transducer with flange mount

"We selected the DFE Model C because, unlike the other transducers we considered, it is designed to measure the tension on both sides of the sheet," LaFave said. *"This is important because it's entirely possible for total tension to be at the right level but for it to be so unevenly distributed across the sheet that wrinkles or other problems occur."* The press manufacturer recommended DFE Model C transducers.



The dead-shaft devices are sealed from dust and moisture and seals are recessed, blocking potential damage. A dual cantilever beam provides high strength and accuracy even at low tension. The device features built-in compensation for changes in idler shaft length caused by temperature changes and deflection.

CUT-AWAY VIEW OF DEAD SHAFT MODEL C TRANSDUCER



Four transducers are used on each line, with one positioned on each side of the last roller feeding each of the two sheets into the folder. Each pair of transducers is connected to a meter that can be set to read the tension on either side of the roller or the total reading from both transducers.

"When we first installed the transducers we could see that we were running at 260 pounds of tension," LaFave said. *"No wonder we were busting rolls! As long as we were running on a single roll we were OK but when the two rolls came together and fired a paster it disintegrated.*

It's critical in a four-color tower to keep tension the same from level to level in order to maintain consistent registration. We could also see that tension varied over a wide range during the press run based on circumstances that were within and outside of our control. For example, the tension varies over the diameter of the roll. Typically, the roll producer will start at a high tension to wrap the core tight, loosen up over the body of the roll, wrap it tight at the end to keep the roll together.

There are also many devices on the lead path that can affect the tension. The folder is the most critical area because everything comes together at that point. The most direct way to control the tension is to add or subtract nip, which adjusts the amount of pull on the paper. The blankets themselves also have an impact on tension through the amount of pull on the paper through the press."

Making decisions based on facts rather guesses

"Knowing exactly what tension we were running at and being able to immediately see the impact of changes let us make decisions based on facts rather than guesses," LaFave continued. *"When we saw that the tension was so high, we immediately switched to a neutral blanket that provided a significant reduction. In addition, we changed the settings, this time keeping an eye on the meter to see exactly what affect we were having. By making these adjustments, we had no difficulty reducing the tension to a range of between 80 and 110 pounds, which is a very safe place to operate. The press operators now watch the meters throughout the night and, when necessary, make adjustments to keep tension in that range. Whenever we make any change to the press, such as installing a new blanket or changing any setting, our press operators immediately look at the meter to determine the impact on sheet tension. In many cases, they spot large increases in tension and they immediately make adjustments to bring tension back into the target range."*

Based largely on the success of this arrangement, many other Dow Jones printing plants implemented tension measurement technology. Plants in Monmouth, New Jersey, Riverside, California, and Dallas, Texas, using Goss presses now use Model C tension transducers similar to those used in Chicopee.

Plants in Charlotte, North Carolina, Federal Way, Washington, West Des Moines, Iowa, and LaGrange, Georgia, using TKS presses have DFE TR2 tension roll transducers.

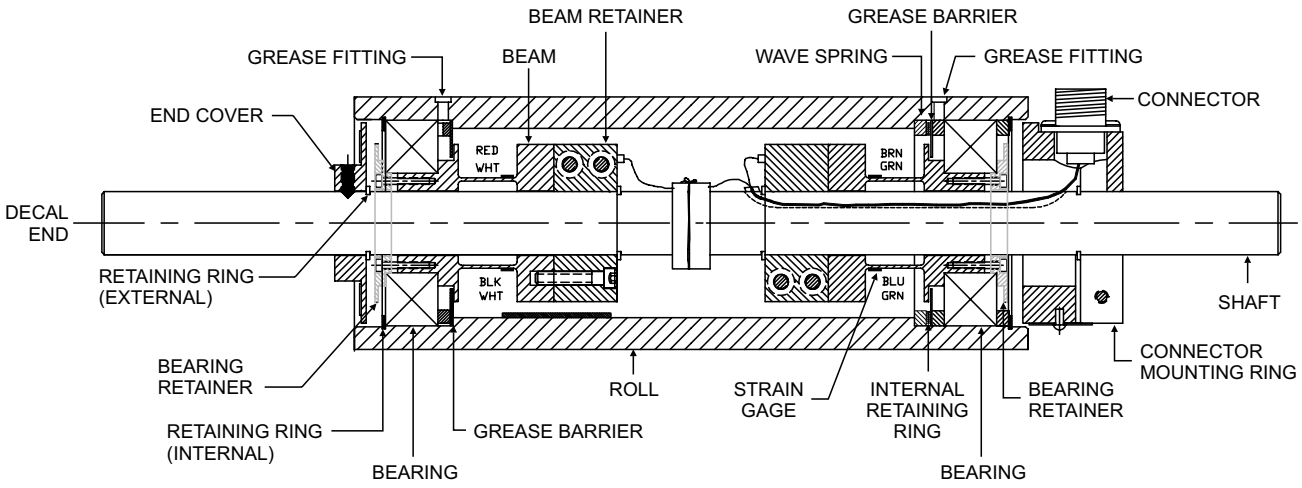
The TR2 consists of a dead shaft idler roll with tension sensors built into each end. This integrated construction makes the TR2 quick and easy to install on any dual-frame web press or machine by dropping it in place of the existing idler roll.

"The tension measurement equipment is valuable in three different ways," LaFave concluded. *"It's a production tool for making changes during actual press runs to reduce total web tension. It's a training tool for operators who can now see how various adjustments they make in the press affect web tensions. And it's a maintenance tool because it points out wear components on the press that may need to be changed for us to achieve our target tension."*

Dover Flexo Electronics, Inc.

www.dfe.com/776chDJChicopee.pdf

CUT-AWAY VIEW OF Tension Roll® TRANSDUCER



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