



ROLL BUMPERS - SAFE AND EFFECTIVE ADJUSTMENT

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Windsor Mill



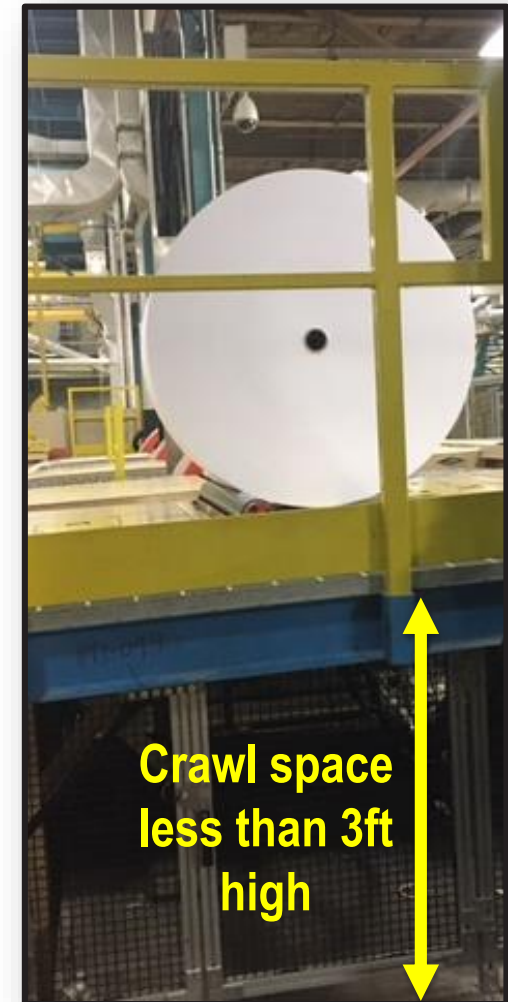
CONTEXT

- Domtar, Windsor mill, produces 630,000 st of fine paper grades
- Paper rolls are of various dimensions, from a few hundred pounds to 8500 pounds (wrap line design capacity). The wrap line typically handles 1100-1200 rolls per day.
- From the outlet of the winders to the roll storage area, through the wrap line there are several bumpers to stage rolls for the next process.



ROLL BUMPERS – THE PROBLEM

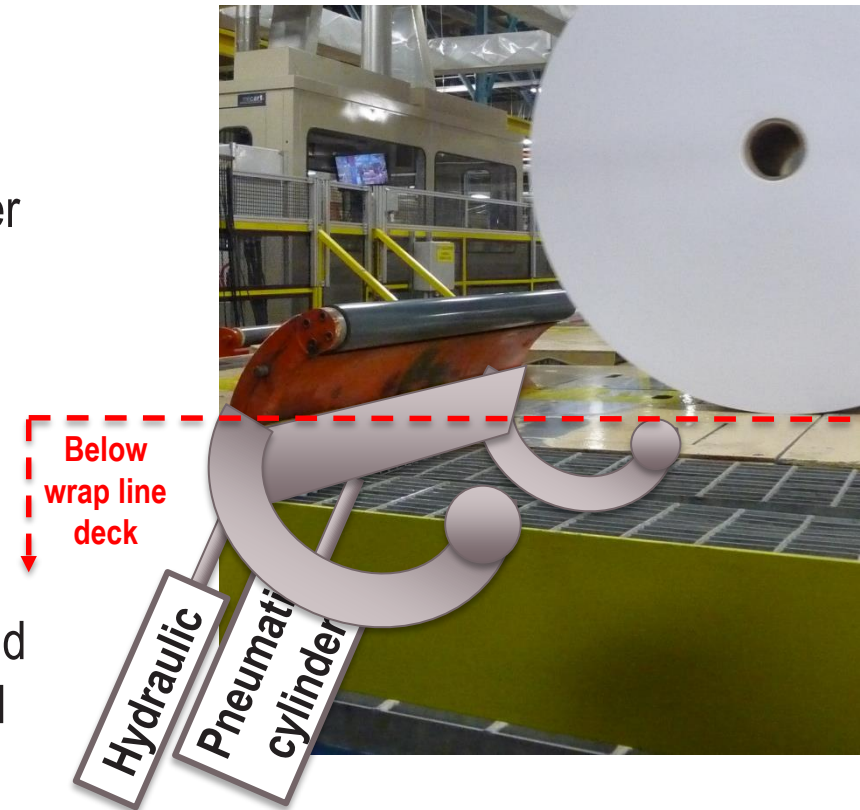
- From the point of view of a maintenance technician
 - Difficult access to adjustment controls, (access hatch in the table floor or under the wrap line);
 - Coordination of zero-energy, several trials and errors required to fine tune: frustrating
 - Adjustments difficult for heavy / light rolls = impacts
 - Poor ergonomics to access and repair frequent break down
- From the point of view of the organization
 - Damage to paper rolls
 - Unplanned break downs of the wrap line (bottleneck) could cause machine lost time
 - Cost of maintenance for cylinders and structure due to repetitive high energy impacts.



ORIGINAL DESIGN

■ Pneumatic and hydraulics

- A proximity sensor detects the roll as it comes down the incline
- The air is released from the pneumatic cylinder to start retracting the bumper
- A hydraulic cylinder takes over to “absorb” the weight of the roll.
- If the hydraulics are too stiff, the roll hits the bumper with considerable force.
- If the hydraulics are too « loose », the roll could carry over the bumper to the next process and cause damage
- The pneumatic cylinder either lowers or raises the bumper back to the receiving position



TWO STEP IMPROVEMENT :

- **Reduce exposure to ergonomic risk: Move controls to a safe area for adjustments**
 - Controls were moved to the side of the wrap line
- **Modified hydraulic controls to control roll deceleration, regardless of roll weight**
 - Richard and Felix designed and installed a mechanical device that changes the speed at which the bumper goes down for a smooth deceleration
 - Speed of decent is not sensitive to roll weight.
 - Ingenious and low cost vs what is available on the market

CONTROLS OUT OF THE LINE OF FIRE



VIDEO

BENEFITS

- No more need to access the crawl space under the wrap line for frequent adjustments
- Less damage to the equipment also means less need to access the crawlspace
- Adjustments can be made safely, with the process online without risking being in the line of fire
- Reduced maintenance cost
- Increased pride and ownership by the maintenance team since they were able to create and implement their idea with support from the site leadership.

THE HPI PERSPECTIVE

- 2 barriers have been reinforced with this project:
- Engineering barrier: much less exposure to ergonomic risks as well as line-of-fire
 - With typical human error rates, high exposure to a risk results in 100% probability that an event will occur at some point in time
- Cultural barrier: employee ideas were recognized and implemented which generates engagement

