ROLL BUMPERS - SAFE AND EFFECTIVE ADJUSTMENT

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Millwrights
Windsor Mill
CONTEX

- Domtar, Windsor mill, produces 630,000 tons 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.
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