Last summer I was operating a grain elevator. It was like any regular day; I was out on the pit emptying the trucks. The wheat dust billowing up and clouding my vision, the constant hum of machinery blocking out all other noise, and the smell of wheat overpowering even the exhaust of the truck. As I monitor the flow of wheat to ensure the pit doesn’t overflow everything changed in an instant. I heard what resembled a fully loaded freight train smashing through a steel wall come from the inside of the elevator. Metal screeching and clanging pure panic grips me for a moment as I come to the realization that the leg is back legging! I had to quickly spur myself into action as their were only moments before it turned into a disaster.

In a grain elevator, there is the leg. The leg is a vertical belt that runs up the entire height of the elevator, about 100 ft tall, that has buckets that scoop up the grain and take it to the top. It is very important to monitor the flow rate of wheat passing into the leg or you can overwhelm its capacity and start filling up the boot. You also need to be aware of what bin the grain is going into and that the distributor is lined up properly or else the flow is obstructed and could clog the pipe. When this pipe gets clogged that’s when you get a back leg.

A back leg is when the grain in the leg has nowhere to be dropped into because the pipe is full, and so the grain just falls down the back of the leg into the boot. When this happens the force on the leg is suddenly much higher than its used to, and can severely damage the machinery. The boot will also fill up with so much grain that it will no longer act as a fluid, but a solid. When this happens, the motor can no longer keep up and will grind to a halt.

If a back leg occurs, the leg will not be able to start again until the boot is clear of all grain. This means that the elevator will be out of commission and those farmers will not be able to continue harvest for as long as we stay closed for repair. This can potentially last for an entire day, since there can be upwards of 500 bushels, or 30,000 pounds, of wheat in the boot that needs to be manually scooped and bucketed out of the boot, and then back into the leg after it can start again.

All these consequences run through my head as I rushed into the control room. I was in a very strange combination of auto pilot and carefully thinking through each action. I first had to stop the flow of wheat. So, I shut the pit gate so that the pit would no longer empty into the boot, cause an overfilled pit takes 10 minutes to clear rather than the time for a back leg to be fixed. After there was no more new wheat flowing into the system, I had to quickly move the distributor to an empty bin. I was so concerned that the distributor was too clogged to be able to move to a new bin, but luckily it moved without a hitch. With the flow of wheat diverted and able to flow once more I had to simply wait to see if my actions were enough. After waiting for the longest three minutes of my life, the leg quieted down and the amps read that the leg was finally empty. With a sigh of relief, I opened back up the pit gate and was able to keep the elevator running, and keep the farmers harvest from being delayed.