In Rolling,
The devil is in the details

DEVILSAM (C) SIMONE MAPOTTA

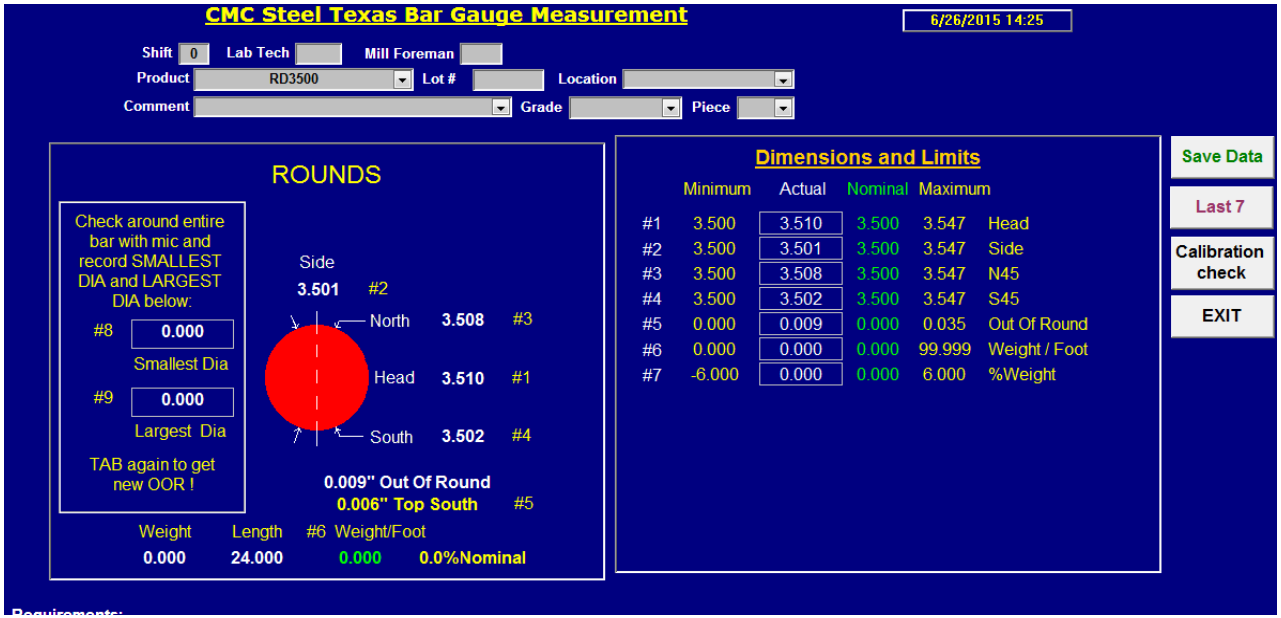
Changing of the Guard

This is very common in todays rolling mills. This will cause confusion in any enterprise especially between departments, veteran employees and recent hires .
A small thing like calling out cross rolls on rounds and squares and understanding the software, could be costly to the company.

Changing of the Guard

- Over time we had been noticing an increase in start-up delays for rounds and squares. Specifically relating to cross. Often times, in the comment field, notes included “moved the cross the wrong way”!
- After further investigation it was determined that not everyone was doing the same things.
- The software that records dimensions was graphically different than the process which made it confusing for newer hires.
- From crew to crew we realized that they were not interpreting the data the same because of this.
- Some crews were calling out the direction of the cross while some crews were calling out the direction to move the cross.

Modify the software



- Aligned the graphics to match the process.
  - Scale break is now shown vertically just as it comes out of the mill.

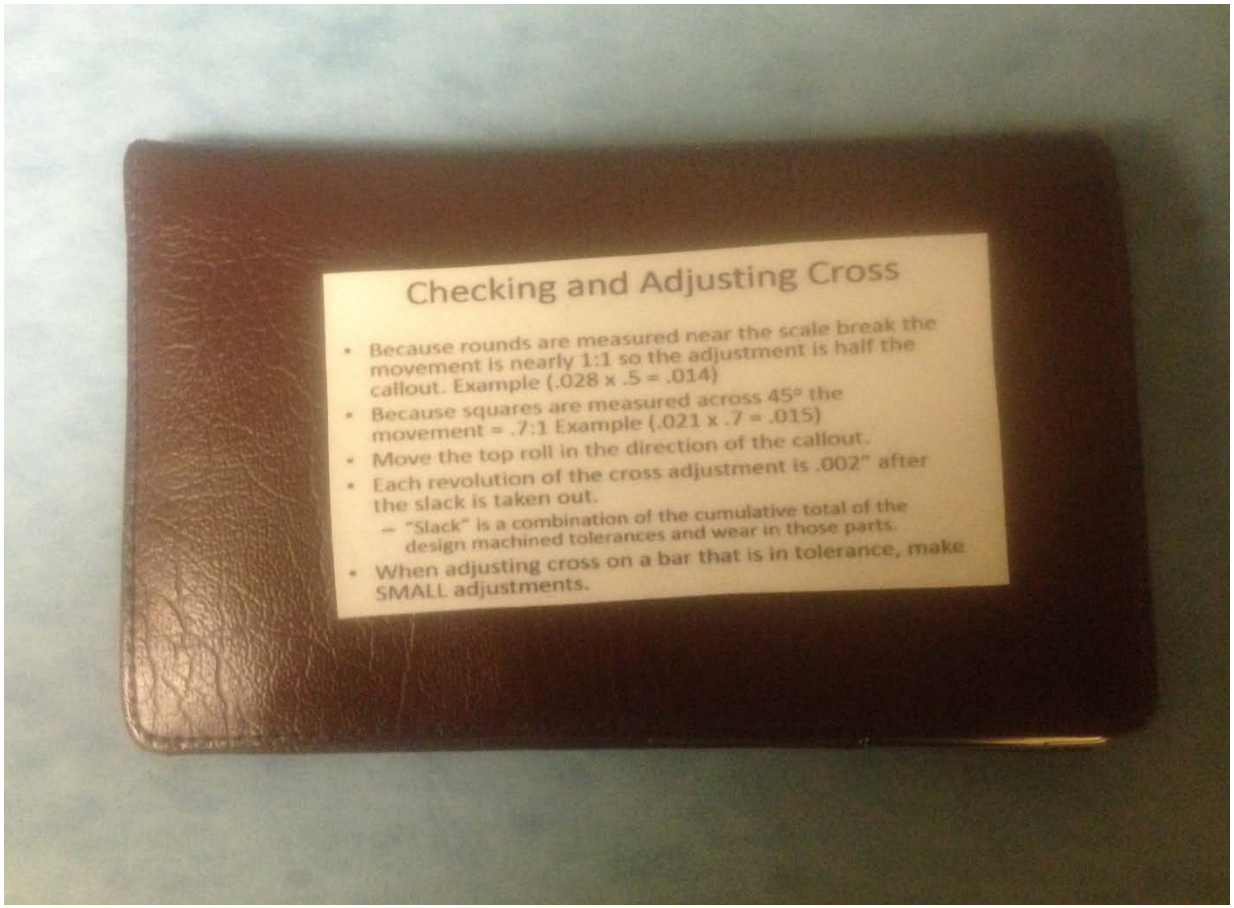
Reboot!

Getting everyone on the same page!

- Developed a training module that details the steps.
  - Including inspection and remediation.
- Gathered all the involved parties for review and discussion.

Follow up

Made up pocket sized, laminated reminders that covered the important bullet points of the training.



PRODUCT DETAILS

- Rolling mill XYZ Uses these grades of Carbide
- NTM 8 inch rings, 20 % cobalt binder with a nickel base, coarse grain size. 83 Rockwell
- NTM 6 inch rings, 15% cobalt binder with a nickel base, medium grain size. 85. Rockwell
- RSM rings, 10% cobalt binder with a nickel base, medium grain size.
- Rolling mill X will be trying to lower cobalt binder and different grain sizes in the future.

- The Devil does not like changes so why change?????

- Why use Nickle Base?
- Why lower cobalt binder?
- Why change grain sizes?

- Thank-you
- The devil

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Mill problem of pitting on final product

- *On May 2 2015, we noticed high spikes on our eddy current & upset failures. We conducted several mill inspections resulting in some roll changes and numerous guides throughout the mill. We finally changed 7 stand rolls because the top roll looked pitted after only 2,257 tons on that set of rolls where we usually can get up to 10,000 tons. That made the problem go away. This issue resulted in over 4 hours of down time and we scrapped out 144 tons of steel*

- *On June 19, 2015, we had to change rolls on 7 stand because the top roll was pitted after running only 2,668 tons.*

- *On July 7, 2015, we had to change rolls on 7 stand because the top roll was pitted after running only 3,386 tons.*
- How did you find and eliminate the problem? corrective action ???

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- *After this 3rd occurrence in just a few months, we noticed that each time this happened it was using the same mill sandwich.*
- *We inspected that mill sandwich and found the water header was loose and the nozzles in the header were plugged.*
- *Our level 3 procedure for building the mill sandwiches includes inspecting the water header nozzles to make sure they're not plugged but that wasn't being followed by at least this one operator.*
- *We took action against the operator who had built all 3 sandwiches,*
- *The message we reiterated to the entire mill.*
- *Not paying attention to details can have a huge impact on our costs and also on their gainsharing checks.*

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Standard Operating Procedures (SOP) Session

Understanding standard operating procedures

What it is

A procedure developed with operator involvement, incorporating safety, and simply but clearly documented (describes process step by step)

A procedure operators are trained on, and is directly observable on the shop floor operations

- *Impact of procedure on process continuously monitored and periodically revised*

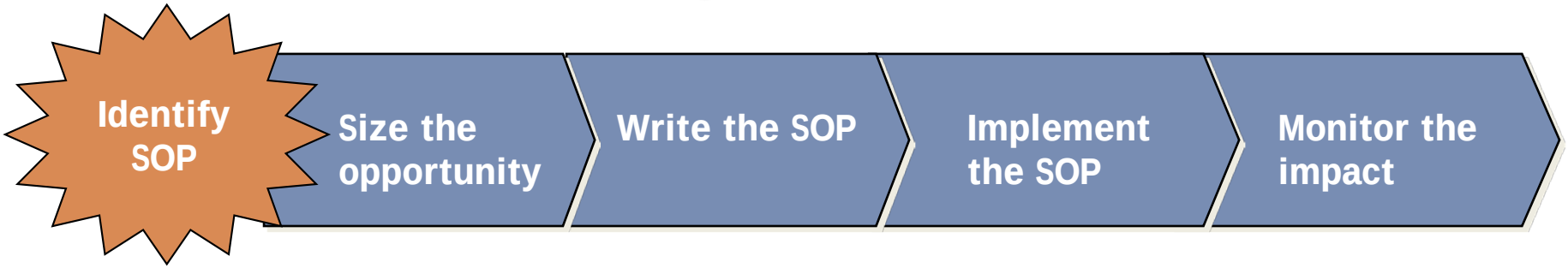
What it is not

- *The equipment's instruction manual*
- *A document developed by management, hidden in a folder in a cabinet, only pulled out when you have an ISO audit*
- *A procedure only referenced to when something goes wrong with the equipment*

Why focus on standardizing operational procedures?

- *Potentially a lot of value to unlock*
- *Relatively easy and quick to implement*
- *Does not require investment*
- *Reinforces operational discipline*
- *Reduces variability in the process, allowing development of stable (i.e., controlled) performance*
- *Fundamental operating tool, base for continuous improvement*

How to create and implement standard operating procedures



- Collect the data
- Analyse variation of Knowledge
- Quantify opportunity from reducing variation
- Understand the drivers of variation
- Meet with operators to get early buy-in
- Establish initial SOP target

- Ensure it addresses root causes of variation
- Involve operators, especially the best performer(s)
- Design standard operating procedure (SOP)

- Communicate the SOP to all concerned
- Create clear expectations from the top
- Train the operators, leveraging the best operator(s)
- Maintain dialogue and leverage early improvements to ensure buy-in

- Monitor daily/weekly the SOP s affected
- Communicate results to operators
- Gather further insight into root causes of variation
- Revisit and revise SOP and target accordingly until technical limit reached

Process comparison begins in your own shop

External benchmarking

- Compare your shop's against
  - Other Steel shops
  - Best in the industry
- Helps identify what is possible elsewhere and sets the challenge

Internal benchmarking

- Examine heat-by-heat/coil-by-coil/shift-by-shift/daily/weekly performance distribution for key drivers of performance
- Identifies opportunities to move to best internal performance

Consider the following examples…

SUGGESTED SOP LIST FOR ROD & BAR MILLS

SOP session should be discussed and then target the most valuable SOPs to be implemented your rolling mill.

- Gap time
- Mixed steel (high and low carbon)
- High and low carbon
- Establish reaction plans to quality defects
- Tracking and analysis of cobbles by shift
- Roll changes
- Start ups: getting/maintaining section
- Changing laying head pipe
- Guide and roll build up
- Pass changing

Each department should review their existing SOPs at least every 1 or 2 years..

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Thank-You

SOP

R.I.P.