**Outline**

**DF-1**

1. Shroud stocking for special cuts
   1. Install shelves under rack next to machine
      1. Need:
         * White board/marker
         * Sheet metal
         * 9-10 rack support arms
      2. Frequency of Stocking:
         * Daily
      3. Responsible Worker:
         * Operator/assistant operator
      4. Process:
         * RW will receive ship list, identify required sizes, transport from overstock rack
      5. Comments:
         * Need historical data of most commonly cut shroud sizes
   2. Gather affected employees and train
2. Install shadow-boards
   1. Fabricate & install shadow-boards to hold:
      1. Need:
         * Flathead screwdrivers
         * Hammer
         * Crimpers
         * Boxcutters
         * Hand planar
         * Brakleen
         * Alan keys
      2. Frequency of Stocking/Inspection:
         * Workers will ensure all tools are replaced by the end of each day to be checked by supervisor
      3. Responsible Worker:
         * Operator/assistant operator
      4. Process:
         * Beginning/end of each shift check for all tools. Missing tools will be reported to maintenance/supervisor.
      5. Comments:
   2. Gather affected employees and train
3. Create spec/setting/procedure sheet for new employees
   1. Self-explanatory.
   2. Quality will train on this once all changes are implemented and train new employees.
4. Install light for underneath RAM.
   1. Investigate model pricing and lumen rating and install between blade and hold downs.

**SH-1**

1. Cutting light
   1. Install a light that facilitates straight edge cuts & training.
      1. Need:
         * To investigate models of lights to determine appropriate steps moving forward with Tarl before finishing planning.
      2. Frequency of Inspection:
         * Daily
      3. Responsible Worker:
         * Operator
      4. Process:
         * RW will turn light on/off at beginning/end of each shift
      5. Comments:
         * Dependent upon price and reliability of laser, may just install a light in front of top blade.
2. Get squaring edge quote
   1. Installing a squaring edge can convert machine to a single operator machine.
      1. Need:
         * Already contacted Allsteel for a quote on one of these.
           + ROI: Potential for benefit to outweigh cost is extremely high.
   2. Gather affected employees and train

**SH-2**

1. Improve “back gauge” reliability
   1. Install tool-less change back gauge for singles and doubles.
      1. Need:
         * Adjustable bar that spans width of machine with:
           + Min length of 2 ¼”
           + Max length of 2 ¾”
      2. Frequency of Inspection:
         * Every new order workers will double check the hook type and adjust accordingly
      3. Responsible Worker:
         * Operator/assistant operator
      4. Process:
         * RW will assess blue and slide back gauge into appropriate position and lock into place.
      5. Comments:
         * Ideally install hand knobs or pin locks into a sliding rail that has an exact half inch adjustment range to avoid any uncertainty in adjustment.
   2. Gather affected employees and train
2. Cutting lights
   1. Install a light or laser that facilitates straight edge cuts & training.
      1. Need:
         * To investigate models of lasers/lights to determine appropriate steps moving forward with Tarl before finishing planning.
      2. Frequency of Inspection:
         * Daily
      3. Responsible Worker:
         * Operator
      4. Process:
         * RW will check the alignment of the laser each day to ensure it does not move.
           + If it does not, we will transition to installing a bar/wire under the light to act as a laser.
      5. Comments:
         * Dependent upon price and reliability of laser, may just install a light in front of top blade.
   2. Gather affected employees and train
3. Create spec/set-up/guidelines sheet to reduce single/double mix-ups.
   1. Install calipers at machine so that each wire diameter can be checked before each cut.
      1. Need:
         * Calipers mounted to station so that diameter of each screen can be checked
         * Single/Double differentiation sheet.
      2. Frequency of Inspection:
         * Before every screen/order
      3. Responsible Worker:
         * Operator
      4. Process:
         * Quality will train on this once all changes are implemented and train new employees.
      5. Comments:
         * This is just an added step so transition should be easy but may encounter resistance. Post-training, mistake consequences can be heightened per Jeff.
   2. Gather affected employees and train

**LP-1**

1. Make U-hook bars/punches more accessible
   1. Weld storage bars on bottom half of press to store U-hook bars & punches
      1. Need:
         * China bars or clamp rails
      2. Frequency of inspection:
         * Self-report to maintenance/supervisor
      3. Responsible Worker:
         * Operator/assistant operator
      4. Process:
         * Workers will make their first hit on the screen, then each will reach under and grab 1 of the 2 bars for final hits and return.
      5. Comments:
         * Will clean out rack behind machine to be used for shrouds. Discard all unnecessary pieces and move remaining to front of machine to re-purpose rack
   2. Gather affected employees and train on process
2. Remove tool storage bin/add hammer holder & shadow-board.
   1. Remove & discard storage bin, make shadow-boards for tools that cannot be held on magnets, weld holder for hammers onto front of machine.
      1. Need:
         * Pegboard
         * Mounting equipment (clips, bolts, nails, etc., as necessary)
         * Scrap metal for hammer holder
      2. Frequency of Stocking/Inspection:
         * Workers will ensure all tools are replaced by the end of each day to be checked by supervisor
      3. Responsible Worker:
         * Operator/assistant operator
      4. Process:
         * Cut bolts to old bin and take inventory of less-frequently used tools. Weld hooks for hammers to front of machine. Cut shadow-board to desired size determinant upon quantity and size of tools it will hold. Trace out tool locations and install mounting equipment. Mount board to wall and instate tools.
      5. Comments:
         * Front mounted magnets will be used for frequent use tools like hand crimpers, flathead screwdrivers, tapes, etc., with the new hammer holsters.
3. Instate Hydraulic lift carts/latching mechanism
   1. Implement hydraulic cart & install latch onto machine to enable tandem operation
      1. Need:
         * Blueprints/list of materials from Candiac
           + Or pre-made cart, whichever is fastest
         * Latching mechanism
      2. Frequency of Inspection:
         * Will monitor over first few weeks to verify safe & reliable operation.
         * Goal is to adjust piston speed to between average and fastest safe speed.
      3. Responsible Worker:
         * Use:
           + Operator/assistant operator – anyone who might use it must understand!
         * Tuning:
           + Maintenance as needed.

May need to be adjustable by operator.

* + 1. Process:
       - Put system in place and monitor speed. If goal is to assist in lifting the screen, it will need to move at a speed between the average and fastest possible speeds across all wire sizes. Too slow and it serves no purpose; too fast and it will push against larger wires creating potential for breakage against excess pressure or improper heating.
    2. Comments:
       - Will likely have to have workaround to adjustment of pistons since they each have their own pressure valves. Need to investigate a simple way to adjust both in unison.
  1. Gather affected employees and train

**Miscellaneous**

1. Straighten out furnace brace
   1. Replace existing brace with a straight bar that is a uniform distance from flame.
      1. Need:
         * 10-12’ 2”x2” tube stock, preferably at least ¼” tick.
      2. Frequency of Inspection:
         * Annual/by request
      3. Responsible:
         * Taylor Smith
      4. Process:
         * Cut existing bar, determine desired distance from flame, install new brace.
      5. Comments:
         * Need to coordinate downtime with Jeff to do this. Should not take longer than 3 hours to cut and re-weld – likely 2 hours.
2. Investigate improving process of screen transfer/storage for faster identification of orders.
   1. Hold meeting with heads of Hooking/Shearing & Overlap/Repair for brainstorming
      1. Need:
         * Cart identification system
         * Paper holder for blues.
         * Dividing system to facilitate inserting screens into middle of pile.
         * May need new tables, dependent upon system agreed upon.
      2. Frequency of Stocking/Inspection:
         * Each screen added to each cart will be placed with the other screens in the order.
           + No 2 screens from any one order should be on two separate tables
      3. Responsible Worker:
         * Overlap/Repair responsible for procedural compliance
         * Hooking/Shearing responsible for process maintenance
      4. Process:
         * Preliminary process:
           + Blues will be placed in front of one another so that first blue indicates top screen and backmost blues indicates bottom screens.
           + Shares burden of locating screens between Overlap/Repair & Hooking/Shearing so that identification time is equally split
         * Further details to be determined by meeting
      5. Comments:
         * Likely pushback from Repair/Overlap – process needs to be tailored to minimizing excess change or strain to encourage compliance.
   2. Gather affected employees and train
3. Overstock shroud rack system by saw.
   1. Remove old saw and install a racking system to stock all common shroud sizes
      1. Need:
         * Racking system
           + Investigate feasibility of purchase vs fabrication due to size.
         * Historical data of most commonly used shroud sizes to label racks
         * Designated shroud cutter.
      2. Frequency of Stocking/Inspection:
         * Daily
      3. Responsible Worker:
         * TDB
      4. Process:
         * RW will inspect quantity of each shroud size and stock to a predetermined maximum number after each machine has gathered their daily required shrouds.
         * They will use blue carts to transport shrouds from overstock rack to the rack designated to their machine, separating with cardboard shims between sizes.
      5. Comments:
         * Need historical data on shrouds and an RW to do this daily.
           + Bernea?
   2. Gather affected employees and train
4. Magnetic tape mounts for every machine x2 (8 total)

**Acquisition of Materials**

1. Identify desired materials & determine what can be used that we already have.
   1. DF-1:
      1. Need:
         * 10x short arm braces
         * Light
         * 5x sheet metal to bend into troughs
      2. Have:
         * Shadow-boards/particle board
   2. SH-1
      1. Need
         * Light
         * Squaring arm
   3. SH-2
      1. Need:
         * Caliper/mount
         * Light
         * 100”x2” steel bar, approx. 3/8” thick
      2. Have:
         * Swing arms/handles
   4. LP-1
      1. Need:
         * Hydraulic lift carts or blueprints & materials
      2. Have:
         * Existing racking system – move to front of machine
         * Shadow-board materials
   5. Miscellaneous
      1. Need:
         * Racking system for overstock cut shrouds
         * 2x(2”x2”20’) tube stock – ¼” thick for furnace
         * 8x magnetic tape mounts
      2. Have:
         * Tables
           + May need more
         * Blue/Order holder – dependent on agreed upon system.
2. Compare prices between types of remaining items needed & decide on cheapest
   1. Short arm braces ✓
      1. Investigating options
         * Rusty Rack Guys – Didn’t have it, Tarl getting lead time to order
         * Northwest Handling – Checking stock
           + Tarl has ordered custom parts from Mr. Rack 4/3/19
   2. 5x(48”x72”) sheets of 16g galvanized steel ✓
      1. Ordered by David 4/2/19
         * Delivers 4/3/19
   3. Lights ✓
      1. 4x 4’ LED magnetic lights for DF-1 & SH-2 - $50
         * 4x Ordered by David 4/3/19
         * Still need 1 for SH-1
   4. Squaring arm
      1. Contacted company requesting a quote 4/2/19
         * Likely only one option from Allsteel
         * 4/10/19 – discovered out of business
   5. Caliper
      1. Purchase will be requested of David/Lani
         * Will do toward end of project to prevent loss/damage
   6. 8x Magnetic tape mounts ✓
      1. Ordered by Dave 4/2/19
   7. 100”x2” steel plate, 3/8” thick & 2x(2”x2”20’) tube stock – ¼” thick
      1. Gave to David for ordering 4/2/19
         * Requested quote 4/3/19
   8. Hydraulic lift carts ✓
      1. Being shipped by Candiac
   9. Racking System ✓
      1. Compared options with needs, only one type worked.
         * Ordered by David 4/2/19

**Priority of Tasks/Desired Timeline**

1. Install new shroud racks and solidify stocking system procedure with Jeff & Barrett. ✓
   1. Fabrication complete 4/4/19
   2. Installation completed 4/10/19
   3. Installing 4/9/19
   4. System to be finalized alongside spec sheet/guidelines 4/18/19
2. Install overstock shroud rack by band saw ✓
   1. Complete 4/4/19
3. Meet with Mike to schedule meeting about screen identification/transfer process to eliminate single/double/general order mix-ups ✓
   1. Discussed 4/5/19
4. Create spec sheets/guidelines for each machine with Barrett & Jeff ✓
   1. Rough draft created 4/9/19
   2. Will continue to polish and finalize by end of project.
5. Install lights ✓
   1. Completed 4/10/19
6. Install magnetic tape holders ✓
   1. 4/16/19
7. Install fans on LP-1 to replace standing fans ✓
   1. Complete 4/18/19
      1. Need to re-mount further apart
8. Remove trough from press ✓
   1. 4/22/19
9. Cut rack behind LP-1 and install on front ✓
   1. 4/23/19
      1. Cut rack into pieces, fabricate mounts/brackets
10. Remove old brace for furnace and Install double bar ✓
    1. Began 4/16/19
       1. Cut 2x2 tube & 4x4 clamp rails for feet
       2. Drilled anchoring holes
    2. 4/23/19
       1. Welded support bars to feet - ready to install
    3. Complete 4/25/19
11. Install new DF-1 back gauge ✓
    1. 4/25/19
       1. Received back gauge, drilled out holes to 5/8” for stronger pistons
       2. Fabricated mount/bracket for air shutoff valve
    2. 4/26/19
       1. Installed bracket, mount, and valve
       2. Had to order new valve to accommodate varying wire thicknesses
       3. Ordered new springs for back gauge to accommodate heavier bar
    3. 4/29/19
       1. Installed new springs, received drill bit/tap for pistons
       2. Once new valve arrives, <30 minutes downtime to complete
    4. Update 5/26/19
       1. Waiting on air reservoir to ensure adequate resistance from pistons
12. Fabricate new back gauge for SH-2 (90% complete)
    1. Began 4/16
       1. Marked locations for holes on new bar
       2. Ordered threaded spring pins for position locking.
       3. Ground angle iron for slide brackets
       4. Coordinating milling/tapping of part for smoother movement w/ Will
    2. 4/18/19
       1. Welded L bracket and support/handle bar
    3. 4/23/19
       1. Drill/tap holes for new bar – installed
    4. 4/26/19
       1. Need William to mill ¼” off edge of new bar morning of 4/29/19
       2. Will drill positioning holes once complete
          1. Need approx. ~3-4hrs down time
          2. Complete
    5. 5/26/19
       1. Only need to install guides/locking pins.
       2. 100% operable until then

**Waiting for Approval**

1. Investigate better screen transfer/identification process
   1. Meeting 4/30/19-5/2/19
      1. Ideas: Colored carts (single/double), poles with paper holders for blues (no more than 5 orders/cart) in chronological order, writing order number on first strip while second strip is cooling, 2 days no repair (weekend) to allow a buffer, mobilize tables under machines
      2. Needs further input: separation of galvanized & OT, HOT cart/dealing with re-runs/changing lines/hooking while extruding (Texas: separation of blue and white)
2. Install “shadow-boards”
   1. Implementing 5/3/19
      1. Scratched physical shadow boards:
         1. Will be taping off sections of machines, painting, and mounting directly to machine
      2. \*Moved to last day to prevent tools going missing
3. Finalize process with Mike, Jeff, & Barrett
   1. 5/3/19
4. Implement training to employees
   1. 5/3/19

**Removed from Timeline**

1. Install latch mechanism to press for hydraulic cart.
   1. 4/1/19 - Yves has stated that questions about this must go through Tarl. We were told it is ready to ship and we would be given a tracking number, but there has been no follow up.
   2. 4/12/19 – Tarl received word that it is not yet ready to ship. It is still 1 week from being ready, and we will then wait 1-2 weeks for delivery, making this outside the scope of the project.
2. Order squaring edge to make SH-1 a single operator machine.
   1. Company is out of business
3. Install linear laser for SH-2 alignment (50% complete)
   1. 4/24/19
      1. Received laser
      2. Ordered rod & articulating bracket
   2. 4/26/19
      1. Received parts, fabricated bracket for laser
   3. 4/29/19
      1. Laser will not work, tilting causes a rainbow effect
         1. William is going to look for other lasers – may scrap/rethink