

Overall Setup reduction strategy

Total set-up time 70-100 minutes (61 minutes on timeline identified for opportunity)

Focus on four areas:

1. Reduce Motion and Movement
 - a. Tools to be located POU (point of use)
 - b. Spacers/knives closer to machine
 - c. Tape
 - d. Improve layout to reduce walking
2. Identify and convert internal tasks to external
 - a. Extra scrap reels
 - b. Dimension and wedge calculations
 - c. Pre-sharpened/clean/organized knives & tooling
 - d. Pre-located coils (inspected and ready to run)
3. Focus on “Choreography”
 - a. Review total set-up tasks and redistribute between helper and operator
 - b. Review Preparation tasks and redistribute between helper and operator
 - c. Identify actions that can be preformed in parallel (vs sequential)
4. Supplier quality
 - a. Review current suppliers for reject frequency
 - b. Identify key raw material problems
 - c. Identify actions to eliminate problems

Action items:

1. Document clearance calculation process **Pat/Terry to review/recommend 6/15**
 - a. By vendor/material (RG, Mittel, Maderas)
 - **Supplier RG (problem with quality) material is no longer used Complete 6/5**
2. Reduce movement of spacers/knives from storage bench to machine
 - a. Evaluate layout of the work area **6/15 Draft of layout complete 6/5** (see attached page 8)
 - b. Fix drawers
- 2a. Red-tag event to remove excess materials, tools, crap **Complete 5-17**
3. Improve communications between shifts **5/25**
 - a. install a white board to leave messages for next shift **Complete 5-20**
4. Store various tapes at machine **12 bins identified and located Complete 6/15**
5. Move bottom support bracket on hook rack to give more clearance **Complete 6/4**
6. Utilize a second set of scrap take-up reels to eliminate 6 minutes of reel change **Revisit with second set 2702. 6/10**
 - **Speed up crane and re-evaluate whether second set is viable choreography**
 - Not feasible 6/1**
7. Mount *working* grease guns on machine for faster access **Change grease fittings and grease tips twice monthly; get supplier to come in to look at process/problem 6/15**
8. Mount tools (cutting, crimping, wrenches) on machines for faster access **6/1** (reduced walking) Requires list of tools. **Complete 6/1;**

Action items:

10. Build extra set of inner slip rings for packing jobs **No**
 - **Get inventory of current slip cores Complete 5/24**
 - Locate B/P's in-house or call Straus for B/P's **6/15**
 - **Found 2 skids of rings; need repair by supplier 7/15**
12. New strapping tools (Battery powered, self crimping) **Not required 6/20**
13. Tare weight on skid provided by supplier
14. Attach a staple gun with chain to up-ender
 - **find alternative method to attach paper Complete. continue to use stapler**
 - **need 2 more staple guns 6/15**
15. Drill access holes in "V" blocks on up-ender for access to hold-down screws **6/15**
 - **design of blocks do not allow access holes; look at bolts/wrench vs Allen wrench using ratcheting wrench**
17. Make fork-lift available at slitter (eliminate waiting for driver) **Dom Compl.**
18. Assess ability to create knife uniformity (part of knife management program) **On-hold**
 - a. width at each machine
 - b. 3-drawer (holds new, 1-side worn, 2 sides worn)
 - look at grind and separate at Grind
19. Repair/replace knife taper switch on control panel **Complete 5/25**

Action items:

21. Buy pre-made clips (vs making metal ones) to be used to hold separators on coils
23. Identify what tools/supplies need repair/replace **all three machines**
 - ref Red Tag event # 2a above **Complete 6/5**
24. Combine computer screens at slitter (Jobs/Symix, coil tracker, setup program) **Complete 6/5**
 - Add a printer at other machines to get set-up programs **6/20**
 - Standardize setups based on successful setup data
25. Keep setup sheets to use for future setup reference **Pat to collect from Terry for 60 days**
26. Replace manual grease guns with air units **phase 2**
27. Quick change 16" – 20" capable on all machines **Maintenance vetoed(safety); look at air wrench 6/15**
28. Evaluate/separate repair/replace clutches and brass inserts **Dom/Bill Murray TBD**
 - **Have skid of bad rings identified for repair**
 - Replate/regrind rings **Need min/max measurements to assess good/bad. Compare to new one as standard Paul**
 - Design storage method using rolling cart **6/15**
30. Place individual paper towels at machines (box or machine) **Complete Dom/Terry 6/15**
33. Review turnstile to eliminate stripping tool and add second arbor **Not feasible 7/1**

Action items:

31. Central location for tape storage at machines. Add tape dispensers. Terry/Mike 6/15
32. Determine potential for extra tooling to allow for second set-up on slip core (see #28)
34. Cut slots in felt holder on “98” to eliminate removing nuts/washers Jack (req. maintenance help)
35. Machine long slot in selected slip rings
36. Eliminate adjusting O.D. on rings and set standard gap opening
 - May require discussion with all operators to set standard work expectations
37. Add White board to grinding room for priority to slitters (due date, size, sets)
 - Availability of person to grind is a capacity problem
38. Automate the centering of the arbor on the takeup (Big Reusch)
 - using arrows on “98”; have recommendation for limit switch to be installed.

Preparation activities: Helper Operator

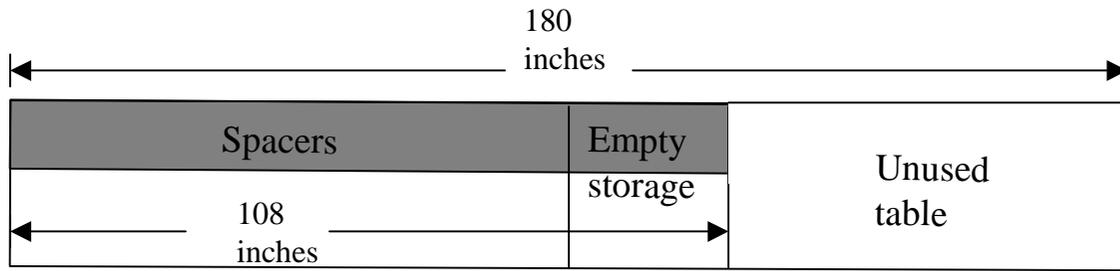
	<u>Current</u>	<u>Planned</u>
Attach paper to skids H	(Internal)	(External)
Setup takeup Spacers H	(Internal)	(External)
Make straps H	(External)	(External)
Confirm Material is available at machine for processing H	(Internal)	(External)
Retrieve coils of material H	(Internal)	(External)
Load coil onto payout H	(Internal)	(Internal)
Verify width H	(Internal)	(External)
Verify thickness O	(Internal)	(Internal)
Paperwork out of computer O	(Internal)	(External)
Identify scrap on reels (determine if removal is needed) H	(Internal)	(External)
Select knives for next job O	(Internal)	(External)

Current Timeline in minutes (61 total)

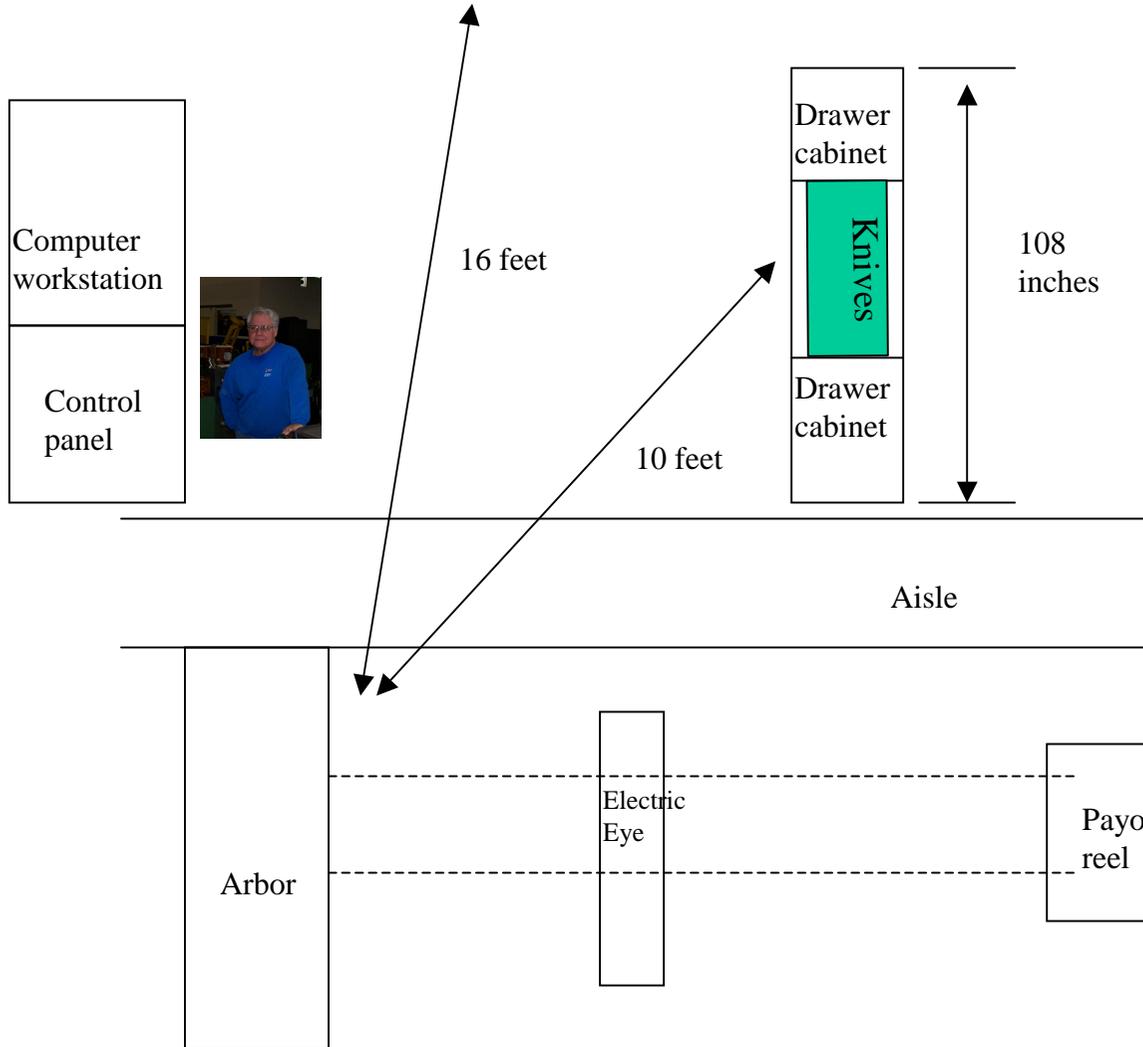
3	4	22	8	4	7	13
Paperwork	Remove knives, change depth	Install knives** ** varies with # of cuts	Change Hub to 16", load Material	Prep material	Remove Scrap reels	Feed material Verify Adjust
Task is done internally	Walking/ motion	Walking/ motion Poor material quality	Non-standard hub size No "quick change" tooling	Internal	Internal time to remove from machine and aside to scrap bin	Non- value material handling
Combine computer screens	Re-layout floor space	6S area; re-layout floor area to smaller footprint Better material from Supplier Eliminate impact of Wedge calculation	Re- design machine hub for quick- change	Perform in external mode	Remove from machine and aside to floor; scrap in external time	Change material feed method; implement knife management steps upstream

Planned Timeline in minutes (30 total)

2	2	10	5	1	3	7
Paperwork	Remove knives, change depth	Install knives** ** varies with # of cuts	Change Hub to 16", load Material	Prep material	Remove Scrap reels	Feed material Verify Adjust

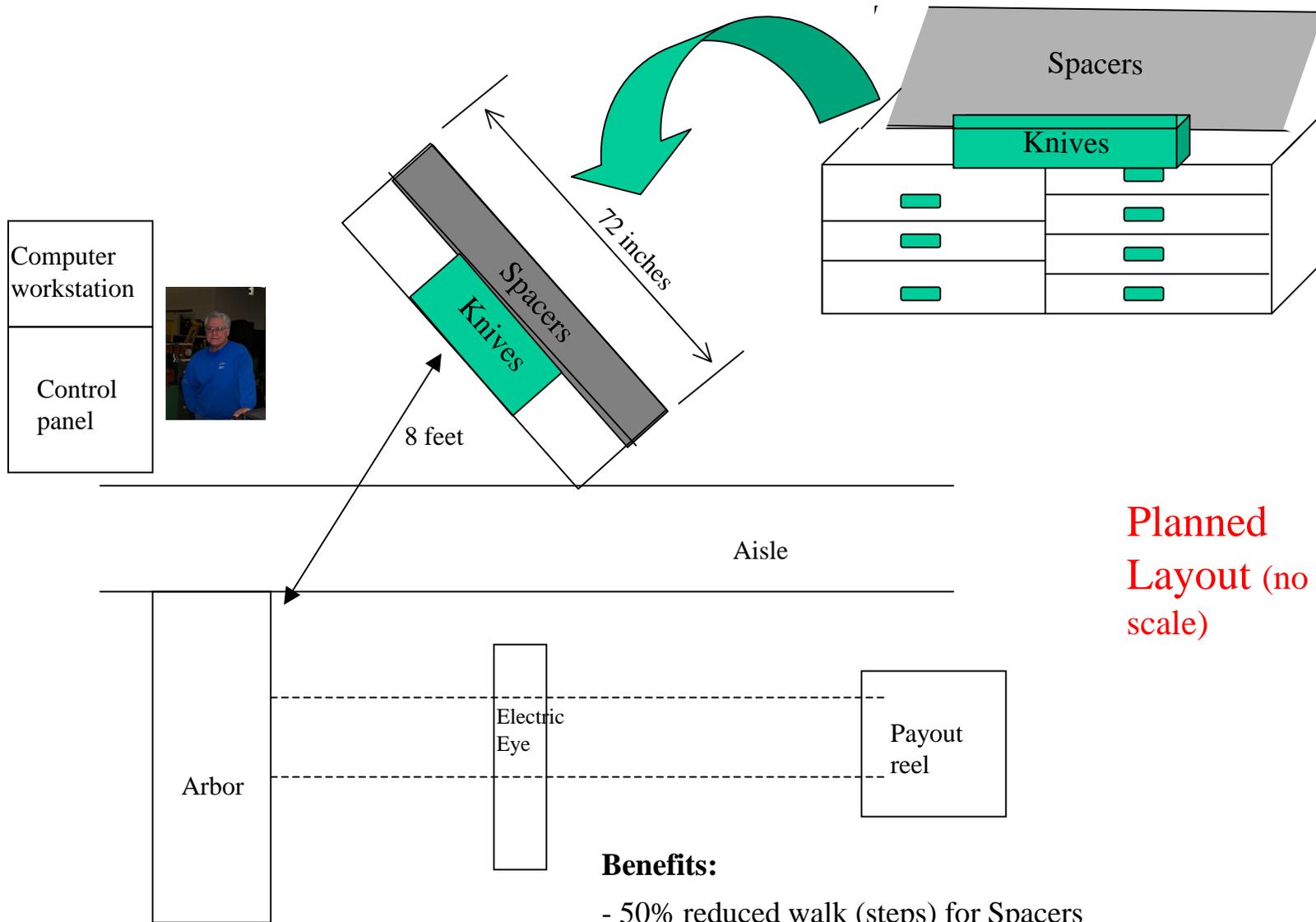


**Current
Layout (no
scale)**



Issues:

- Extensive NVA walking
- Ergonomic/safety issues for handling spacers & knives
- Cluttered floor space with empty cabinets
- No POU storage



Planned
Layout (no
scale)

Benefits:

- 50% reduced walk (steps) for Spacers
- 20% reduced walk (steps) for Knives
- Reduced ergonomic issues for handling spacers & knives
- Less cluttered floor space
- Single POU for storage

Results

Metric	Before	After	% Improve
Setup time	61 minutes	47-51 minutes	18 –22% reduction
Coils per shift	3	3.8	21% increase
OEE	21%	25%	17% increase