



University of Houston — College of Technology
Lesson Plan — PRESS I
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Class Session 9	Date	Topic Premakeready and Makeready
DeJidas, chapters 11–12		Text/Chapter
Preparation		
Take Attendance	Announcements	
None		Test
Lecture/Demonstration I. Types of Press Time A. Chargeable Time 1. Makeready 2. Running 3. Washup B. Nonchargeable time 1. Also known as downtime. II. Premakeready A. Premakeready consists of procedures that shorten makeready time and prevent downtime and other		

Lecture/Demonstration continued

issues that contribute to a press crew's productivity.

- B. Printing Plant Layout—helps to reduce downtime and increases productivity.
 - 1. Space Allocation and Equipment Location
 - a. Location of each item depends on sequence of normal activities. Talk about poor layout of Bosco lab.
 - b. Space around a press depends upon the need to move equipment such as fork lifts around and paper storage needs as well as physical comfort of the operators.
 - 2. Accessibility of Tools
 - a. Convenience to operators.
 - b. Each machine should have its own set of tools—sharing of tools decreases productivity.
 - 3. Floors and Aisles
 - a. Floors must be constructed of concrete that can withstand the weight of the equipment plus material handling equipment such as fork lifts.
 - b. Aisles should be marked with long-wearing tape or paint—nothing should be stored in aisles.
 - c. Aisles should be wide enough for fork lifts and palette jacks to be maneuvered.
- C. Tools
 - 1. Tools should be ready and available before the makeready begins.
 - 2. Hunting for tools during makeready wastes valuable time.
 - a. There are times during a press run when an operator may be idle. That person can prepare tools while waiting.
 - 3. Presses generally come with assorted hand tools and instruments. Others can be obtained locally:
 - a. Torque wrench for tightening blankets.
 - b. Wrenches, screwdrivers, Allen wrenches, sockets, ratchets, etc.
 - c. Specialized tools such as blanket gauge, micrometers, packing gauge.
 - d. Magnifiers
 - e. Densitometer
 - f. Specific gravity tester
 - g. pH tester or strips
 - h. Conductivity tester
 - i. Sword hygroscope
 - j. Durometer
- D. Materials
 - 1. Paper must be on hand and ready to use when the job is ready for makeready.
 - a. Purchased and delivered on time
 - b. Paper conditioning/temperature conditioning
 - c. Pressroom should be temperature and humidity controlled.
 - d. Paper should be checked for wavy edges
 - e. pH of coating should be checked
 - f. Straightness of gripped (head) edge should be checked.
 - 2. Ink
 - a. Inks should be tested, adjusted and color matched long before makeready.
 - 3. Blankets, dampeners, rollers
 - a. A spare set of dampeners, rollers and blankets should always be available.
 - b. Blankets should be rotated so that they can “rest”
 - 4. Packing sheets

Lecture/Demonstration continued

- a. Briefly explain what they are.
 - b. Should be hard, water-resistant, easy handling, and cut to the dimensions of the plate.
 - c. Several thicknesses should be available at each press.
5. Material Testing and Reporting
- a. Makeready of a particular job is not the time to test new materials.
 - b. Plants should test new materials before using them for production runs.
 - c. Only tested and acceptable materials and supplies should be purchased. Buyers should not purchase specially priced materials on a whim.
- E. Inking and Dampening System Washup
1. Washups are charged to the job that dirtied the press—the previous one, not the one being made ready.
 2. Good washups can be considered a part of premakeready because it will save makeready time
 - a. glazed rollers don't transfer ink properly and cause makeready times to be increased.
 - b. poorly cleaned rollers often results in dried ink particles that can cause hickies and decrease productivity during the makeready and press run.
 - c. single color presses often need a "color-wash" before a new color is run to prevent ink-color contamination.
 - d. Multicolor presses seldom need color washes because ink-color sequence is rarely changed.
 3. A clean dampening system works better and decreases makeready time.
- F. Teamwork
1. Many of the activities of premakeready can be performed by a junior member of the press crew while the previous job is being run.
 2. Each member of the crew should be assigned specific premakeready duties by the lead press operator.
 3. During the previous job, the following tasks should be completed (assigned by lead press operator)
 - a. cleaning up the work area
 - b. getting and replenishing supplies and materials
 - c. preparing blankets
 - d. getting, checking, and transporting paper for the next job.
 - e. adjusting ink
 - f. making fountain solution
 - g. putting tools away (cleaning them if necessary)
- G. Scheduling
1. Jobs should be scheduled so that the press can take advantage of similarities between jobs (relate ITEL plant) and so that jobs will be completed by their due dates.
 2. Every department in the plant should know what job is to be printed when. This is important for material procurement (especially paper ordering, receipt, conditioning, cutting, piling, delivery to press).
 3. The lead press operator should assign a member of the crew to start thinking about the next job while the current job is running. The operator should check for the following:
 - a. what the job order says and what its' job number is.
 - b. if the plates are ready
 - c. if the paper has been conditioned and piled
 - d. if there are any waste sheets available
 - e. if packing sheets, blankets, rollers, dampeners, etc. are available

II. Makeready

- A. Makeready is a series of operations that changes over the press from the settings required by one job to the settings required by the next.
1. Makeready begins when the crew starts to set the machine for a given job.
 2. Makeready ends when the press is printing acceptable sheets and the customer has "signed-off" on the

Lecture/Demonstration continued

quality.

3. An efficient makeready requires that all the materials and supplies needed for a given job are on hand before the makeready begins (premakeready).
4. Because makeready is chargeable time, the makeready start and end times must be recorded.

B. Types of Makereadies

1. Simple

- a. requires only changing a plate
- b. ink, ink fountain, dampening system, and paper remain unchanged.
- c. example would be a book

2. Partial

- a. Running previously printed sheets through the press for additional impressions. Examples would be printing a 4-color job on a 2-color press, or a 4-color two-sided job on a four-color single-sided press.
- b. Requires new plates, ink change, unloading delivery and reloading feeder.
- c. Feeder, registration system, and delivery settings are not changed (much).

3. Complete

- a. All steps necessary to start a new job from scratch
- b. Color washes are usually necessary on one- and two-color presses.
- c. Plates and packing are changed, blankets are washed, feeder, registrations, and delivery systems are adjusted.
- d. Feeder is loaded and delivery emptied.

C. An appropriate metaphor for a makeready is "pit-stop."

1. Presses are very expensive to own and operate—the more time they are producing, the easier it is to pay for their high costs.
2. To decrease makeready time, press operators should consider themselves part of a pit crew.
 - a. Each member of the crew has specifically assigned duties.

D. Makeready Procedures (note: changed order from text)

1. Prepare the press for the new pressrun.
2. Check copy, plates, paper, and ink against instructions (job ticket)
3. Prepare the makeready "books" and place them in the feeder
4. Set sheet-handling mechanisms.
5. Pack and mount plates.
6. Check and prepare new blankets (if necessary).
7. Prepare the dampening system.
8. Prepare the inking system.
9. Make trial impressions
10. Inspect trial impressions
11. Make adjustments to image position/register, impression quality, and density
12. Repeat 9-11 until job meets specifications.
13. Get OK (customer "signs off" on job).

E. The "team" and each members' responsibilities during makeready

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F. Inking system washup (only a few ideas to mention)

1. Two-step solution (water miscible to remove water-based chemicals and oil-based to remove ink)
2. Be sure to have MSDS on hand for every wash-up solvent.
3. Be careful not to use a rag to clean moving rollers.

Lecture/Demonstration continued

4. Don't neglect ink fountain (especially under it) and the edges of the fountain.
 5. Applying a copperizing solution to steel ink rollers—done to make the roller resistant to stripping—requires that the rollers be very clean.
 6. Durometer of rollers should be checked periodically. Some hardened rollers can be improved using special cleaners. If a too-hard roller cannot be softened, it must be reground or recovered.
- G. Cleaning the dampening system (a few ideas to mention)
1. Makeready is not the time to recover cloth dampening rollers—there should always be a clean set of dampeners available for easy and fast change-out.
 2. Cloth coverings should only be cleaned with specific dampener roller cleaner—ink must be removed in such a way that the cloth remains hydrophyllic.
 3. Changing covers or swapping rollers results in changed dampener-form to plate pressure that must be readjusted if the press is to print properly.
 4. Dampeners should only be run one direction in a press—if they are switched end-to-end, the cover will become loose.
- H. Checking instructions
1. Any variation between copy, plates, paper and ink and the job ticket must be reported immediately to the supervisor.
 2. This should be part of premakeready.
 3. Note: This step presupposes that job tickets have been completed and accurately completed—an important job for the order-entry personnel.
- I. The makeready “book”
1. 10 clean new sheets between 50 waste sheets.
 2. A complete book is about 1100 sheets—more if it is a complex job.
- J. Setting the sheet-handling systems—according to manufacturer's instructions.
1. Load the feeder with the stock for the job.
 2. Place the makeready book on top of the good stock.
- K. Installing the Plate: according to manufacturer's instructions—more about this in Press II.
- L. Preparing dampening system
1. Install clean or recovered dampeners if necessary.
 2. Set roller pressures.
 3. Prepare dampening solution.
 4. Check pH and conductivity levels—compare to standards.
 5. Turn on circulating pumps, fill fountain pan and tank with solution.
 6. Set ductor dwell
 7. Set fountain roller speed (initial setting)
 8. Procedures may vary for non-conventional dampening systems.
- M. Preparing the inking system
1. Check the work order for the proper ink to be used.
 2. Check ink for proper characteristics, such as tack number, etc. for the color sequence:
 - a. Most common sequence is KCMY (used 80% of the time)
 - b. CMYK is used 7%
 - c. YCMK is used 4%
 3. Fill the ink fountain
 4. Pre-set the fountain keys or edges by rotating the fountain roller manually when the ductor is touching it—look for an even flow (note: this can be done automatically with plate scanners)
 - a. Always feed ink to every part of the rollers—even if there is no image there. This ink is necessary for lubrication and to prevent ink “vacuums.”

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5. Ink up the rollers
6. Set the speed of the fountain roller.

N. Trial Impressions

1. Wash the gum off the plate(s).
2. Turn on dampening system(s) and check for even dampening
3. Ink the plate (sometimes the ink turns on automatically)
4. Start the feeder, put press on impression, and watch sheet(s) pass through press (check proper feeding)
5. Stop the feeder, take press off impression, the turn off the dampening and inking systems.

O. Checking trial sheets

1. Registration (to sheet and to other color(s)) (more covered in QC lecture)
2. Quality of print (more covered in Troubleshooting lecture)
3. Ink/water balance (more covered in Troubleshooting lecture)
4. Color (density of print) (more covered in QC lecture)
 - a. Be sure that overall color of print is examined under 5000° lighting.

P. When press operator is satisfied with the trial sheets, an OK must be received (usually customer or customer's representative is present for this OK).

Q. Run the job (some ideas)

1. Reset counter.
2. Take "pulls" during the run. Check same points as O above and:
 - a. plugging of halftones
 - b. scumming
 - c. excessive inking
 - d. printing defects (more in Troubleshooting lecture)
 - e. CONSISTENCY of color
 - f. Trapping (more in QC lecture)
3. Use anti-setoff powder if necessary (use minimum amount to avoid setoff)
4. Separate delivery load into small sub-stacks (draw diagram) if very shiny stock.
5. Run specified number of sheets, including predetermined spoilage allowance.
6. Perform premakeready for the next job.
7. If the job must be interrupted because of end-of-shift or other shutdowns, the plates must be completely cleaned and gummed (you can leave them on the press if you have a washup machine), blanket and impression cylinders cleaned, and the ink rollers and fountains washed (sometimes people use an anti-skin spray—it scares me!).