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TRAINING NEW WORKERS QUICKLY

In The
TEXTILE INDUSTRY

Comprehensive plan
developed by textile
mill in South

in cooperation with
**APPRENTICE-TRAINING
SERVICE**

Reprinted through the courtesy of
TEXTILE WORLD

WAR MANPOWER COMMISSION

*Bureau of Training
Apprentice-Training Service*
Washington, D. C.

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FOREWORD

The textile industry, just as all major industries during the war emergency has been faced with the task of training thousands of new recruits to keep abreast of its manpower demands. The increasing pressure for greater and greater production and the continuously decreasing supply of available skilled workers has made it necessary to train completely inexperienced men and women, in record breaking time, for jobs requiring the skill and dexterity of seasoned employees.

How a large cotton textile plant in Georgia has solved its training problem is explained in the following pages. The comprehensive training plan adopted by this company, described herein, was developed in cooperation with W. Ernest Spain, Apprentice Training Technician, and other members of the staff of the Atlanta office of Apprentice-Training Service, War Manpower Commission. It is based on studies and surveys of manpower and production demand, and training facilities of textile plants in the South. As stated by an official of the company which adopted this system:

"The Apprentice Training Service made an intensive study of our problem and recommended the development of an over-all training plan, an adequate training staff, and job instructors to administer the training under production conditions within the plant. The service and assistance rendered our company by this agency enabled us to make use of the knowledge and experience of our older employees to prepare new employees more quickly and effectively to do their assigned jobs. These efforts also resulted in a method of training which considerably shortened the normal training time in most of the principle job classifications. This program was also the means of obtaining good results in retraining some of the old employees, both in effectiveness and new production procedures."

The system has been in effect at this company's plant since the first part of 1943.¹ Since many of the operations at this plant are similar to those in common practice throughout the industry, the training system established there may be used as a guide by other companies facing similar manpower problems, in the development of equally successful systems.

WILLIAM F. PATTERSON,
Director, Apprentice-Training Service.

¹ This explanation of the training system is reprinted through the courtesy of *Textile World*, which published it originally under the title of "Training New Employees Quickly." in its July 1943 issue.

TRAINING NEW WORKERS QUICKLY IN THE TEXTILE INDUSTRY

FOR TRAINING NEW EMPLOYEES QUICKLY and for upgrading experienced workers to more responsible positions, a comprehensive plan has been developed by WMC in cooperation with one of the larger southern textile mills. Essential features of the program include: (1) use of manning tables and replacement schedules, (2) training job instructions, (3) working out job progression charts, (4) drawing up operation sheets for each job, (5) training new employees, and (6) training maintenance men and loomfixers. In setting up the plan, management and supervisory personnel of the plant met with representatives of WMC's Apprentice-Training Service and exchanged information that contributed greatly to the development and execution of the training procedures adopted. The survey included consideration of labor and production requirements.

There was little uniformity in training methods, and few potential instructors had been given the principal job instruction techniques. For this reason, development of job instructor training techniques and of a well-trained staff of instructors consumed a considerable portion of the time required for formulating the over-all training plan.

A TRAINING SUPERVISOR was appointed to coordinate all the training. To provide him with first-hand information, a general training advisory council of management representatives and instructors, and various departmental advisory councils were formed. Training records and grading methods were established to serve as a part of the permanent personnel department file on trainees. Recommendations also were made to provide more orderly withdrawals of workers into military service.

PRODUCTION IN POUNDS IN EACH DEPARTMENT—40-HR. WORK WEEK						
Process	Units in Place	40-hour Units	Pounds Produced	Pounds per 40-hour Unit	Capacity 40-hours	Average hours per wk.
Picking						
Carding						
Drawing						
Slubbing						
Spinning						
Twisting						
Spooling						
Winding						
Warping						
Warp Twisting						
Filling Twisting						
Slashing						
Beaming						
Tying-In						
Drawing-In						
Weaving						
Cloth Room						

Figure 1a.—Form (face) giving important information on departmental loads shows how shifts can be arranged so that each department can relate its overall operating time to the anticipated production; form also provides the training supervisor with training schedule information.

The first step was a survey to determine those jobs in the plant where the need for replacement was greatest and to select the jobs which are best for beginning practice and skills. Analysis of production in relation to the setting up of a plant training program and replacement schedule was done on forms shown in figures 1a and 1b. To facilitate planning, work stations were diagrammed and the job assigned to each station was listed.

To develop a well-trained staff of teachers, methods were used

PRODUCTION SCHEDULE		
X represents units of 25,000 lb. O represents units of 25,000 lb. above actual prod.		
Department	Actual and Anticipated Production	Actual Hrs. Worked
Picking	XXXXXXXXXXXXXXXXXXXXX000000	
Carding	XXXXXXXXXXXXXXXXXXXXX000000	
Drawing	XXXXXXXXXXXXXXXXXXXXX0000000	
Slubbing	XXXXXXXXXXXXXXXXXXXXX000000000	
Spinning	XXXXXXXXXXXXXXXXXXXXX	
Twisting	XXXXXXXXXXXXXXXXXXXXX000000000000000	
Spooling	XXXXXXXXXXXXXXXXXXXXX00000000	
Winding	XXXXXXXXXXXXXXXXXXXXX00000000	
Warping	XXXXXXXXXXXXXXXXXXXXX00000000000	
Warp Twisting	XXXXXXXXXXXXXXXXXXXXX00000	
Filling Twisting	XXXXXXXXXXXXX0000000	
Slashing	XXXXXXXXXXXXXXXXXXXXX000000000000	
Beaming	XXXXXXXXXXXXX0000000	
Tying-In	XXXXXXXXXX000000	
Drawing-In	XXXXXXXXXXXXX00000	
Weaving	XXXXXXXXXXXXXXXXXXXXX000000000000000	
Cloth Room	XXXXXXXXXXXXXXXXXXXXX	

Figure 1b.—Form (back) showing actual and anticipated production in each department of the mill which indicates to training supervisor how training must be scheduled by each department so as to maintain or increase production, as may be required.

similar to those outlined under "Job Instructor Training," TEXTILE WORLD, March 1942. This training was spread to as many employees in all departments as was possible in order to speed the teaching program. Special attention was given by instructors to the introduction of trainees to their new jobs and surroundings. To assure proper induction, a check list of the information given a new employee was used.

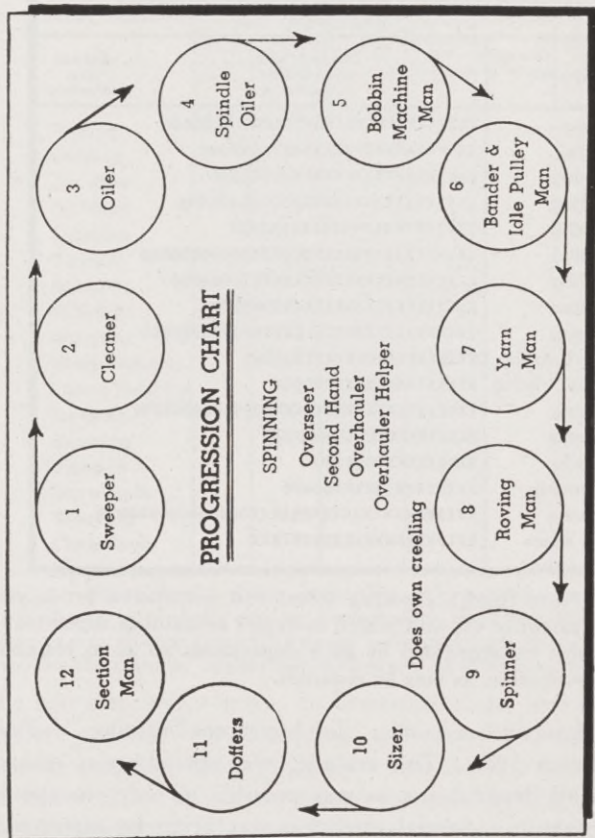


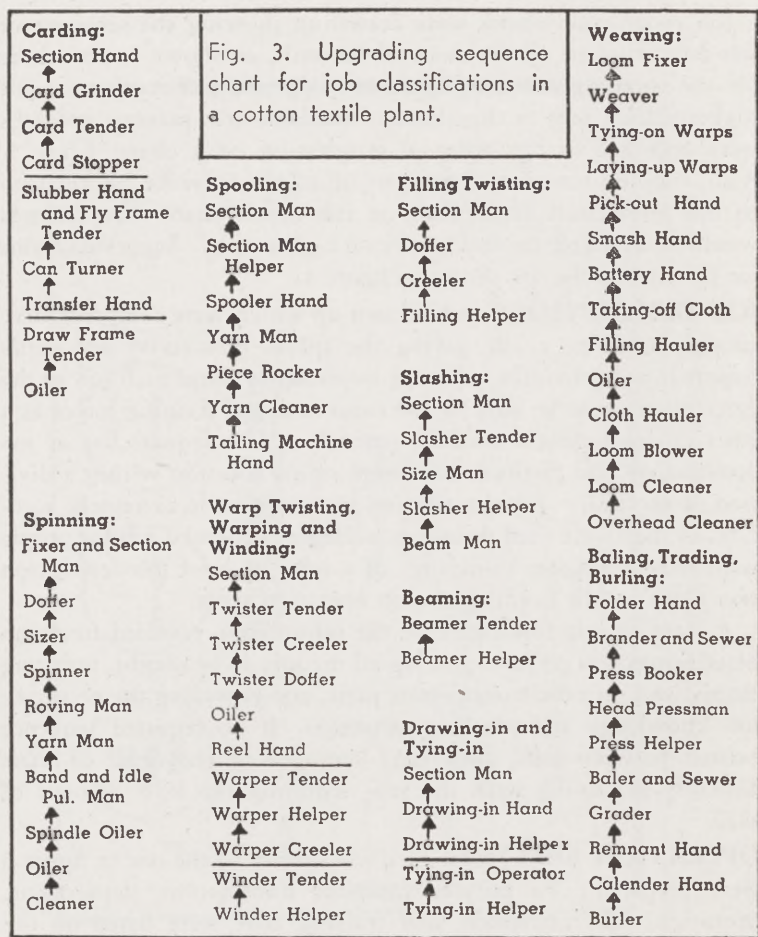
Figure 2.—This chart shows department jobs classified in the order of their difficulty. No 1 is the beginning job, thence through Nos. 2, 3, 4, etc.

Job progression charts were drawn up showing the sequence of job difficulties in all divisions of the mill, as shown in the chart for the spinning division, figure 2. Upgrading of workers to fill higher-skilled jobs as they became available was planned and jobs were arranged in the order of progression on a chart, figure 3. Also, training time tables were set up to give advance information to the production department on the approximate time trainees would be available for full service on a given job. Suggested forms for the time tables are shown in figure 4.

JOB DESCRIPTIONS were drawn up which were comprehensive enough to define a job, giving the sphere of activity and skills required, and providing sufficient information about each job so the description could be used by the supervisor and training forces as a basis of developing a training schedule. An adequate list of job descriptions also justified some form of job rotation within a division of the mill. Job descriptions were not made extremely accurate, as they were used mostly as a "fence" around a job for people with only a passing knowledge of a job. A brief job description was given on the heading of each operation sheet.

A training schedule based on the information revealed from job descriptions was prepared, listing all the jobs to be taught, breaking them down into their component parts, and providing the necessary job knowledge and teaching sequence. If no required sequence existed between jobs, they were arranged in the order of their difficulty beginning with the jobs requiring the least amount of skill.

OPERATION SHEETS for each job similar to the one in figure 6 were prepared. To provide complete information, department, operation, job description, and training time were listed on the heading. Based on the operation sheets it was assumed that the operations listed would represent the teaching units for that job. Not more than 8 or 10 new ideas were included in a teaching unit



in order to prevent confusion of the learner. Each operation listed was broken down into steps, and each step listed in the proper

TRAINING TIME TABLE				
Department <u>Weaving</u>		Date Report Submitted <u>1/22/43</u>		
		By Whom <u>John Doe</u>		
Name	Loom Cleaner	Oiler	Battery Hand	Smash Hand
John Reynolds	X	X	X	X
A.C. Crittenden	X	X	10-5	10-10
Oscar Sumner	-	-	11-2	11-17
Carl Bracks	10-1	10-10	X	X
R. Bannister	10-1	10-15	11-5	11-15

Note: X means the workers can now do the job,
 — means the worker doesn't need to learn the job,
 10-1, 10-15, etc. are the dates the supervisor has set
 for himself, to have the men able to do the job required.

Figure 4.—Time table of dates trainees should be ready to perform various jobs.

sequence for performance. In using the sheets for instructing, teachers divided the whole operation into groups of steps, and each step was based on material covered by the learner's previous experience, so that overlapping of training would not result. The instructor was then ready to proceed, keeping in mind that the trainee must master each group before proceeding to the next. Forms, figure 5, were prepared for recording the progress of trainees and are kept in a permanent office file. These forms include a suggested grading scheme which was also used in recording the progress of trainee workers.

Preemployment training of high-school students was conducted to form a reserve of new workers that could take jobs in the mill with little additional training. For those students desiring to enter the mill, practice machines and instructors were provided at

the school. Training away from the productive job required more time than training on the job; however, fundamental information and minimum practice in some basic job operations were given. In all courses of this nature the training followed the outline of actual work on the job. Each instructor had some practical knowledge of the job he taught, and worked closely with the plant training supervisor. Many of the operations of the teaching unit

TRAINING RECORD							
Department _____				Job Classification _____			
Name of Trainee _____				Age _____			
Previous Experience _____				Sex _____			
Date Training Began _____		Finished _____		Weeks Required _____			
Grade (Quality of Work) _____				Instructor _____			
Remarks _____							
Week Ending	Hours Worked	Days Out No Report	Pct Job Assigned	Instructor's Report			
				Interest	Coop- eration	Ability	Effort
1.							
2.							
3.							
4.							
23.							
24.							
25.							
26.							
Remarks: _____							

Figure 5a.—Sheet (face) used for grading a trainee's progress and response to training.

Name of Trainee _____														
	Week Ending							Week Ending						
	M	T	W	T	F	S	Total	M	T	W	T	F	S	Total
Hours Worked														
Job Assigned														
Interest														
Cooperation														
Ability														
Effort														
	Week Ending							Week Ending						
	M	T	W	T	F	S	Total	M	T	W	T	F	S	Total
Hours Worked														
Job Assigned														
	Week Ending							Week Ending						
	M	T	W	T	F	S	Total	M	T	W	T	F	S	Total
Hours Worked														
Job Assigned														
	Week Ending							Week Ending						
	M	T	W	T	F	S	Total	M	T	W	T	F	S	Total
Hours Worked														
Job Assigned														
(8) Eight hours worked							(R) Sent out to rest							
(S) Out Sick							(O) Out - no report							

Figure 5b.—Sheet (back) used for grading a trainee's progress and response to training.

were speeded up by having trainees study supplementary subjects such as cotton mill mathematics, cloth calculations, safety rules, and other subjects that touched upon his job.

APPRENTICESHIP TRAINING was conducted for a limited number of jobs. Relatively few cotton-mill jobs require all-around skill that classifies them as apprenticable. Among those that can be considered apprenticable are the jobs of general maintenance,

OPERATION SHEET

DEPARTMENT: *Carding*

TRAINING TIME:

OPERATION: *Card Tender*

Approx: 6 weeks

JOB DESCRIPTION: Operation of a card (carding machine) which converts lap into sliver, cleaning and straightening the cotton fiber in the process; under close supervision of card grinder.

STEPS AND NECESSARY INFORMATION

- | | |
|---|-----------------|
| <ol style="list-style-type: none"> 1. Lay full laps when old laps run out; place lap-rods on floor between the cards. <ol style="list-style-type: none"> a. Run old lap out as near as possible before laying new lap. Do not let the lump at the tail go through card. b. Lap hauler removes lap rods. Safety precaution: Do not leave lap rods in dangerous position. c. After a line of laps has been laid check back and see if there are any laps splitting or running crooked. If so correct them. d. Place all lap waste in waste can. 2. Piece up all ends in front. <ol style="list-style-type: none"> a. Observe front ends regularly between other jobs so that ends can be constantly kept up. b. Place all waste in waste cans. 3. Secure empty cans, doff full ones, and haul full cans to breaker drawing. <ol style="list-style-type: none"> a. Empty cans can be secured from slubbers or drawing frames. b. Be sure cans are empty. 4. Assist card grinder to move grinding rolls. <ol style="list-style-type: none"> a. Under direction of card grinder. 5. Clean fronts twice each shift. <ol style="list-style-type: none"> a. Use piece of strip waste. Dirty fronts cause ends to come down. 6. Mop card clean (once each week). <ol style="list-style-type: none"> a. At time convenient to operator. 7. Sweep beneath card. <ol style="list-style-type: none"> a. Front and back — once each shift. Put waste in boxes and push full boxes to end of line of cards. 8. Take down strips (just before stripping time); haul to end of card line. <ol style="list-style-type: none"> a. Strip off waste into box. 9. Clean scavenger (once each shift). <ol style="list-style-type: none"> a. If scavenger roll gets too large, it will not stay in place. | } Teaching Unit |
|---|-----------------|

Figure 6.—An operation sheet which can be used for planning the learner's training.

Figure 7.—Training time the maintenance apprentice is allowed for each job.

Maintenance Apprenticeship MECHANICAL	
Tool Room Clerk	6 Weeks
Drill Press Work	4 Weeks
Hack Saw	4 Weeks
Lathe Work—Roughing Steel	3 Weeks
Lathe Work—Semi-Finishing	8 Weeks
Lathe Work — Finishing	8 Weeks
Lathe Work — Cast Iron	4 Weeks
Key Seating	1 Week
Gear Cutting — Spur	4 Weeks
Gear Cutting — Worm	2 Weeks
Gear Cutting — Spiral	6 Weeks
Gear Cutting — Bevel	6 Weeks
Shaper Work	2 Weeks
Milling Machine Work	8 Weeks
Reading Mechanical Drawings	2 Weeks
Operation & Care of Pumps	4 Weeks
Operation & Care of Air Compressors	6 Weeks
Instruction & Practice in Humidification	10 Weeks
Plumbing	6 Weeks
Underground Piping	4 Weeks
Steam Fitting	8 Weeks
Operation and Care of Boilers	8 Weeks
Total Apprenticeship	114 Weeks

loom fixing, second hand, and supervisor. Apprentice training was given in the jobs of general maintenance and loom fixing, and charts were prepared listing the skills to be acquired and the approximate time that should be allowed for training. Figure 7 shows the chart

prepared for the maintenance apprentice. Sufficient time was allowed for the apprentice to reach a high degree of skill on each operation.

In conducting apprenticeship training, careful consideration was given to the selection of apprentices, the term of training, the supervision of apprentices, related instruction, work processes, apprentice incentives and examinations. The apprenticeship training was sponsored and supervised by the training advisory council in the same manner that it functioned on other matters of training.

Visual-aid devices which were considered in putting over the training jobs and for the general education of the worker, included such things as movie or voca-film on safety practices at home or on the job, fundamental manufacturing processes in textiles, mill short cuts and trade kinks, and the history of textile manufacturing. Other visual aids suggested were cut-away sections of machine models; glass inclosed samples of defects in cloth; case histories and illustrations of modern streamlined production methods. Adequate textbook and reference materials for supplementary reading were made available.

This plan was tailor-made for one plant. Therefore, it must be modified for other mills to suit local conditions and requirements.

TRAINING ASSISTANCE

Available Through

APPRENTICE-TRAINING SERVICE

Apprentice-Training Service, which was established in 1937 as a section of the Division Labor Standards, U. S. Department of Labor, was transferred in 1942, by Executive order, to the War Manpower Commission. Although originally set up as a peacetime agency concerned solely with apprentice training, when the call first came to this country in 1939 to speed up the production of war equipment, it focussed its sights to include short-term training. Since then, it has been helping American industry to build up the ranks of semi-

skilled specialists for the mass production line, as well as all-round skilled workers, by the development of over-all training programs, including both short-term and apprenticeship systems.

The services, briefly outlined below, are provided to industries without cost by field representatives of the Apprentice-Training Service.

1. *Training Apprentices*.—Assistance is given in improving or inaugurating apprenticeship programs and providing suggestions on methods and techniques relating to the operation of such programs and on adapting apprenticeship to war production needs.

2. *Training Advancing Workers*.—Advisory assistance is provided regarding the training of advancing workers as exemplified by the system described in the foregoing pages. These are workers being trained for skills of more limited scope than journeyman, but which require a fairly high degree of skill. The period of training for such workers is shorter than for apprentices but the problems of training are comparable.

3. *Labor Relations Affecting Training*.—Assistance is provided in dealing with labor problems encountered with the operation of on-the-job training programs. Typical problems applying to training include: Seniority rights, wages, number to be trained, hours of work, establishment of training schedules and breakdown of operations, establishment of shifts, standards of selection, and supervision of trainees.

4. *Supplementary Labor Agreements*.—In plants where employees are organized, assistance is provided in preparing supplements to established bargaining agreements where the existing agreement is not sufficiently flexible for the war training and employment situation.

5. *General*.—In many instances assistance is also provided with regard to occupational deferments, employment requirements of Federal or State laws, and problems of production as they relate to training.

REGIONAL OFFICES

WAR MANPOWER COMMISSION APPRENTICE-TRAINING SERVICE

For information regarding the services of field representatives of the Apprentice-Training Service in the establishment of apprenticeship systems and other types of in-plant training programs, communicate with the representative at the nearest regional office listed below:

Region I
(Maine, N. H., Vt., Mass.,
R. I., Conn.)

Region II
(New York State)

Region III
(Pa., N. J., Del.)

Region IV
(Md., Va., W. Va., N. C.,
D. C.)

Region V
(Ohio, Mich., Ky.)

Region VI
(Ill., Ind., Wis.)

Region VII
(S. C., Ga., Tenn., Miss.,
Fla., Ala.)

Region VIII
(N. Dak., S. Dak., Nebr.,
Iowa, Minn.)

Region IX
(Mo., Kans., Ark., Okla.)

Region X
(La., Tex., N. Mex.)

Region XI
(Mont., Idaho, Utah, Wyo.,
Colo.)

Region XII
(Oreg., Wash., Ariz., Nev.,
Calif.)

E. K. Jenkins, Supervisor
Room 744, 55 Tremont St.
Boston 8, Massachusetts
John M. Marion, Supervisor
Room 617, Old New York State Bldg.
New York, New York
Glenn H. Feller, Supervisor
Room 922-925, Stephen Girard Bldg.
Philadelphia 7, Pennsylvania
Robert F. Handley, Supervisor
Room 401, 1025 Vermont Ave., NW.
Washington 25, D. C.
John E. Morley, Supervisor
Room 674, Union Commerce Bldg.
Cleveland, Ohio
Cecil L. Utterback, Supervisor
222 W. Adams Street
Chicago, Illinois
J. M. Parmelee, Supervisor
Room 600, Grand Theatre Bldg.
Atlanta, Georgia
John F. Barrett, Supervisor
Room 500, Midland Bank Bldg.
Minneapolis, Minnesota
Taylor F. Custer, Supervisor
Room 1600, Fidelity Bldg.
Kansas City 6, Missouri
Travis J. Lewis, Supervisor
6th Floor, Mercantile Bank Bldg.
Dallas 2, Texas
Edw. E. Goshen, Supervisor
Room 614 Security Life Bldg.
Denver 2, Colorado
Broncel R. Mathis, Supervisor
Room 701, Western Furniture Exchange and
Merchandise Mart
San Francisco 3, California