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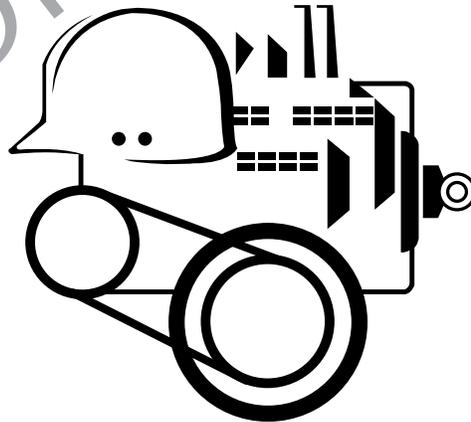
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EMPLOYEE RELATIONS

Lesson One

**Defining the
Supervisor's Job**



TPC Training Systems

90601

Lesson**1*****Defining the Supervisor's Job*****TOPICS**

Administrative vs. Job-Related Duties
Performance Evaluations
Orientation and Training
Discipline

Job-Related Supervisory Duties
Budget Your Time
Improving a Difficult Job
Symptoms of the Supervisor in Trouble

OBJECTIVES

After studying this lesson, you should be able to...

- List the elements of the supervisor's administrative duties.
- Calculate workload.
- Explain why a strong preventive maintenance program is desirable.
- Calculate crew efficiency.
- Explain the values and uses of counseling, progressive discipline, and training.
- Calculate productivity.
- List the elements of the supervisor's job-related duties.

KEY TECHNICAL TERMS

Workload 1.02 type and amount of maintenance work required

Resources 1.04 available labor, materials, and tools

Preventive maintenance (PM) 1.08 scheduled inspection and care of equipment

Crew efficiency 1.09 manpower use measured against job goals

Productivity 1.17 the amount of work performed during a certain time

Overall, supervisors perform five management functions as part of their job. The five are: planning, organizing, staffing, leading, and controlling. They are used to identify and organize the total workload, as well as individual jobs.

Part of your job is managing the total workload. To do this, you must plan how to obtain needed resources such as materials, parts, and tools. You must also determine your manpower needs and decide if your workers have the right skills. You must train, counsel and rate your employees, and evaluate job costs. These are all administrative duties.

You perform the same management functions again when supervising an individual job. This time, though, your work is focused on the details of the work at hand.

In this lesson, you will learn how to manage administrative and job-related duties. You will also learn how to control labor and material costs and how to evaluate crew performance.

Administrative vs. Job-Related Duties

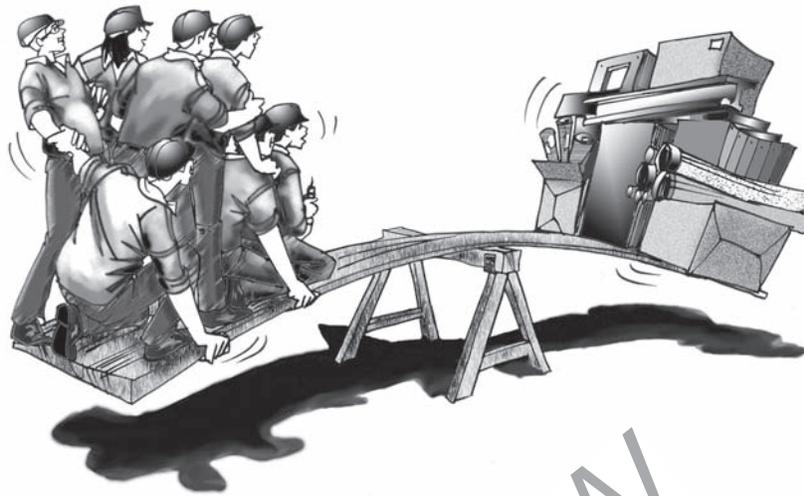
1.01 Your administrative duties refer to the total workload. Your job-related duties refer to the details of an individual job. A chart comparing the two types is shown in Fig. 1-1.

1.02 **Planning.** Your first step should be to identify the *workload*. This means knowing both the type and the amount of work to be done. The type of work defines the skills needed. The amount of work and the time you have to complete it indicate the manpower needed (Fig. 1-2 on the following page). Consult job

Fig. 1-1. Scope of supervisor's responsibilities

Type of function	Administrative duties	Job-related duties
Planning—Describes the workload in terms of labor and materials needed.	<ul style="list-style-type: none"> Identifying total crew workloads Determining needed labor and materials Developing equipment, facility, and tool inventories 	<ul style="list-style-type: none"> Identifying scope of individual jobs Determining specific labor and material needs Providing tools and work facilities
Organizing—Applies the needed resources to the required work to make up a schedule.	<ul style="list-style-type: none"> Justifying total resources required for workload Determining suppliers of labor and materials Applying controls to labor and materials 	<ul style="list-style-type: none"> Specifying job instructions Obtaining resources from suppliers Maintaining job records
Staffing—Lists craftsman needed, being sure that necessary skill levels are reached.	<ul style="list-style-type: none"> Assessing crew capabilities Assigning personnel to jobs 	<ul style="list-style-type: none"> Determining specific job skills Approving overtime as needed
Leading—Motivates crew to reach performance goals.	<ul style="list-style-type: none"> Orientating, training, and disciplining employees Rating individuals; awarding raises and promotions 	<ul style="list-style-type: none"> Giving specific job instruction Directing on-site work
Controlling—Acts to be sure work done conforms to plan and to desired performance levels.	<ul style="list-style-type: none"> Ensuring adherence to schedule Setting quality control standards Evaluating costs, including scrap rates 	<ul style="list-style-type: none"> Being sure jobs are completed promptly Confirming quality control conformance Accounting for rejects and scrap

Fig. 1-2. Balancing workload and personnel



records for information on manpower requirements. Add data on recent projects and new equipment to bring the records up to date.

1.03 Once you have identified the workload, you are ready to specify and budget the resources needed to handle it. Your facility probably has budget and cost control procedures. Ask for an explanation of

how these work. You may find similar procedures useful in your own budgeting process.

1.04 **Organizing.** Before you can organize your labor and material *resources*, you need to know where to get them. Stock materials usually come from a control stockroom or warehouse (Fig. 1-3). Some parts may be fabricated in the shop. Identify where you can get extra manpower, parts, and tools for peak workloads. The ability to quickly find labor and material sources should become second nature so that you can fill these needs in a hurry. Failure to think about resources in advance means you may be caught short in an emergency.

Fig. 1-3. Know your material needs and their sources



1.05 **Staffing.** Can your crew do the job? To employ your crew members effectively, you must know what each person can do. Compare your crew's capabilities with the workload. Only then can you determine your staffing requirements. Perhaps you need a larger crew. Or you may need more advanced skills than your crew can supply.

1.06 Several other conditions affect your staffing decisions. Is yours a single- or multi-craft crew? Will you include other supervisors in the planning process? Is this a task that requires the effort of several crews? Will your crew have to wait for another crew to finish its work before beginning the job? The answers to these questions will determine some of your hiring decisions.

1.07 **Leading.** Do your employees have good work attitudes? Are they cooperative? Try changing

disinterest with corrective measures such as special awards. Conduct skill and attitude evaluations frequently. Do you see any improvement? If not, plan to use further training, counseling, discipline, or merit increases. In a union shop, of course, some of these factors are set by contract.

1.08 **Controlling.** The workload is balanced when enough of the right craftsmen are available to handle the assigned workload. At this point, you can divide the workload into the following categories and assign personnel accordingly:

- **Preventive maintenance.** Scheduled inspecting, lubricating, testing, adjusting, and cleaning the equipment.
- **Scheduled maintenance.** Component replacements, rebuilds, overhauls, and other major equipment actions that require downtime.
- **Emergency work.** Unexpected situations that could result in injuries, equipment damage, product loss, or unusual downtime.
- **Nonemergency work.** Short-duration repairs that can be done at any time.

Performance Evaluations

1.09 Suppose you have several jobs to do tomorrow. You will inspect and oil a punch press (preventive maintenance), overhaul a conveyor system (scheduled work), and carry out an unknown amount of unscheduled and emergency work. Determine the crafts you need and distribute your crew according to the kind of work each person will be doing. Estimate how long each task should take. Your estimates then become the job goals. To test the *crew's efficiency*, measure the manpower actually used against the job goals (Fig. 1-4). Your goal is to perform all preventive and scheduled maintenance on time, respond quickly to emergency and nonemergency repairs, and minimize equipment downtime.

1.10 Even though they are part of a team, individual crew members may ask for certain types of work. Keep these preferences in mind when making job assignments—if they fit the crew's objective.

1.11 Look for individual differences as the work progresses. Do some people enjoy the challenge of a real emergency? In contrast, do others carefully diagnose a problem and then search for the correct solution? Can you depend on those who like to be told

Fig. 1-4. Compare manpower actually used to your goal

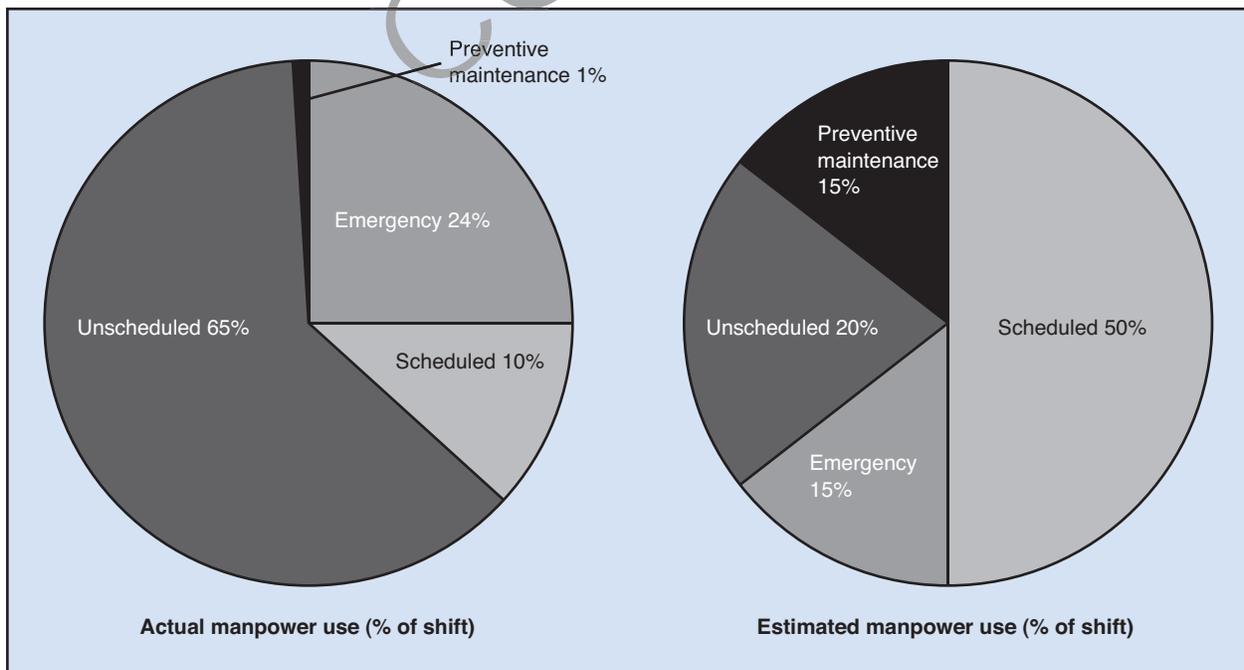


Fig. 1-5. Counsel your craftsmen and encourage them to improve their performance



what to do to follow your instructions step-by-step? And what about unexpected complications that show up on the job? You have to consider all these characteristics when assigning crew members to particular tasks.

Orientation and Training

1.12 Be sure you let crew members know the kind of effort you expect from them on the job. This simple idea is often overlooked, and can be quite effective in cases where the training is adequate. Both orientation and training may be given to a group or to an individual, and both may benefit you as job performance improves.

1.13 Some cases, such as a craftsman who turns in low-quality work, require individual counseling (Fig. 1-5). First, show the worker how his or her current performance or behavior is not up to standard. Then ask him or her if they know why their work is suffering. Is something at work—or at home—affecting their performance? Offer help by building on whatever individual strengths there are, emphasizing the need for acquiring additional skills or modifying behavior. Continue the counseling sessions in order to point out improvements.

Discipline

1.14 Sometimes, despite counseling, an individual's job performance does not improve. Then you may have to discipline him. Progressive discipline is

a form of punishment that starts off as a mild warning, followed by time off without pay, eventually leading to discharge if there is no improvement. Use counseling at the same time you discipline an employee. The combination of discipline and counseling is effective in reducing some problems, such as taking unauthorized breaks on the job.

1.15 As another example, suppose two crew members don't get along and bring their problem to you. What do you do? The smart thing is to listen to both sides before trying to solve the problem. If you can't solve it, you will have to submit it to the next higher management level. Follow the same method if an employee disagrees or finds fault with you. Perhaps a dissatisfied employee states a grievance against a certain action or working condition. If you cannot resolve the grievance, you should submit it to the maintenance manager or labor relations representative. No doubt your company has a grievance procedure. Be sure to follow it. The important thing to remember is that the employee has a right to a satisfactory explanation of an action or working condition. You cannot just ignore his complaint.

1.16 Whether you are counseling, evaluating, or disciplining someone, be sure to follow the rules and time intervals prescribed. Your evaluations must be objective and complete. Most likely you will have to fill out a performance evaluation form (Fig. 1-6). Pay or promotion awards depend on your judgment. You

can look forward to good crew morale and a satisfactory supervisor/worker relationship if your evaluations are consistently fair and objective.

1.17 **Controlling productivity.** *Productivity* is a measure of how much work is done during a given time. Low productivity means the crew is not working to full capacity. What are some of the problems that interfere with the job? Can you correct them easily? There's no need to wait for independent evaluation. You can uncover some of these problems just by making your own check:

- crew members waiting for missing tools or parts
- work slowed due to poor instructions
- a job slowed or stopped because needed craftsmen are missing.

1.18 Preparing a budget showing the costs of your jobs is one kind of cost control. Use actual labor and material costs to figure each job and compare real costs with cost targets.

1.19 Usually you will have to justify the materials, staff, and services you request for a job. Your best answer is to spell out what you expect to do and what you need to do it. Know the workload before estimating needed labor. Labor is generally more difficult to justify than tools and equipment unless your estimate is accurate. Materials are easier to justify because you need only specify the spare parts, tools, and equipment needed.

1.20 Manpower and work controls can help you get the job done. You will probably develop some of your own control measures, such as the way you assign work. Others may be company policy. For

Fig. 1-6. Performance evaluation form

Name _____ Clock No. _____
 Program _____ Period _____

WORK PERFORMANCE

Area	Definitely Failing	Just Failing	Marginal	Good	Very Good	Exceptional	Remarks
JOB QUALITY	Accuracy	Much spoiled work	Frequent errors	Tends to make errors	Normal mistakes	Seldom makes mistakes	Very exact
	Speed	Inexcusably slow	Consistently slow	Occasionally slow	Normal speed	Usually fast	Consistent high output
	Neatness	Sloppy	Poor	Acceptable	Presentable	Well above average	Extremely neat
	Job Understanding	Dull	Needs constant supervision	Usually needs help	Needs little additional instruction	Readily understands	Self-reliant
JOB HABITS	Safety	Hazardous to self and others	Careless	Occasionally forgetful	Observes most rules	Observes all rules	Safety-minded
	Care of Tools and Equipment	Destructive	Neglectful	Exercises minimum care	Considerate	Shows marked responsibility	Very conscientious

PERSONAL TRAITS

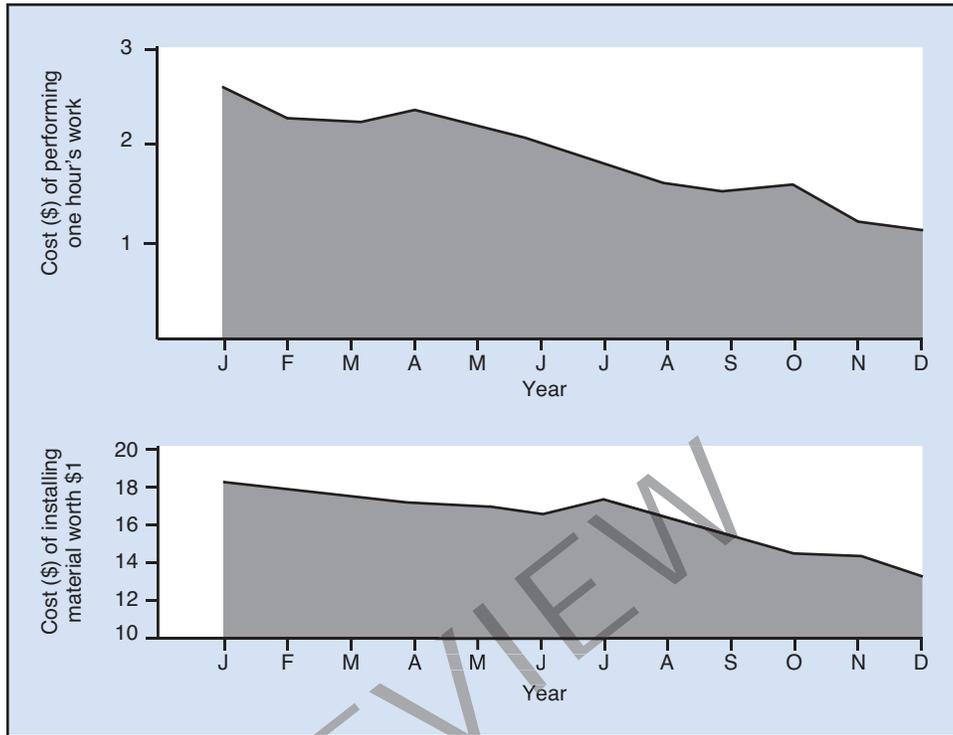
Initiative	Lazy	Needs frequent motivation	Does minimum required	Active	Resourceful and alert	Eager
Promptness	Habitually late	Irregular	Occasionally late	Usually on time	Seldom late	Never late

Percentage grades: Work performance ____% (2/3) Personal traits ____% (1/3) Grade for period: _____

Noted by _____ Dept. location: _____ Date _____

Employee _____ Reviewed by: _____

Fig. 1-7. Evaluate your crew's cost performance over a year

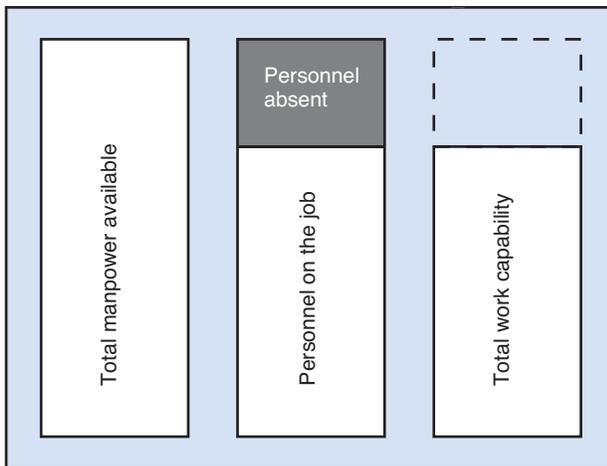


instance, the controls for preventive maintenance (PM) work are built into the maintenance program. Your skill in using these controls and in training your crew to use them often determines your success as a supervisor.

1.21 Charting your own long-term performance is another kind of cost control. Use charts similar to those in Fig. 1-7 to plot your basic labor and material costs and note the trends over a year.

1.22 Absenteeism deprives you of labor you need to complete the workload and greatly increases costs (Fig. 1-8). You can reduce absenteeism by setting a firm absentee policy and by counseling chronic offenders. Also, if several craftsmen are on vacation at the same time, you will not have enough labor to meet the workload. Schedule vacations at the start of the year and establish a limit on the number of workers allowed to be off the same week.

Fig. 1-8. Absenteeism limits performance



The Programmed Exercises on the following page will tell you how well you understand the material you have just read. Before starting the exercises, remove the Reveal Key from the back of your book. Read the instructions printed on the Reveal Key. Follow these instructions as you work through the Programmed Exercises.

<p>1-1. Identifying the _____ is the first step in job planning.</p>	<p>1-1. WORKLOAD Ref: 1.02</p>
<p>1-2. Your second step in job planning is to specify the _____ required.</p>	<p>1-2. RESOURCES Ref: 1.03</p>
<p>1-3. You must balance your crew's capability against the _____.</p>	<p>1-3. WORKLOAD Ref: 1.05</p>
<p>1-4. Scheduled inspections, lubrications, adjustments, and cleaning is called _____ maintenance.</p>	<p>1-4. PREVENTIVE Ref: 1.08</p>
<p>1-5. By measuring your estimates against the manpower actually used, you can test your crew's _____.</p>	<p>1-5. EFFICIENCY Ref: 1.09</p>
<p>1-6. Your main goal is to perform repairs quickly and minimize equipment _____.</p>	<p>1-6. DOWNTIME Ref: 1.09</p>
<p>1-7. Progressive discipline starts off with a simple warning, but can eventually lead to _____.</p>	<p>1-7. DISCHARGE, FIRING Ref: 1.14</p>
<p>1-8. The amount of work performed during a given period of time is called _____.</p>	<p>1-8. PRODUCTIVITY Ref: 1.17</p>

Job-Related Supervisory Duties

1.23 Suppose you already know the kind of work and how much is to be done. Now you are ready to process the job, request the support of a planner, write the work orders, and begin work control procedures. Is the job routine or does it need your special attention? Also, can you depend on the crew to carry out the work without a lot of supervision?

1.24 What tools and supplies are needed? How will the work be done? Individual craftsmen can sometimes arrange for the tools and materials needed for minor, routine jobs. Overhauls and other major jobs, however, may need careful thought and the help of a planner to specify labor and materials. The planner can also help coordinate craftsmen when the supervisors are busy. You have to consider the needs of the production department as well as maintenance. Plan on completing a major job on a certain date and in the shortest possible downtime. If you have to order special parts, allow enough time for delivery. Have all needed parts, tools, and other materials on hand before requesting labor or scheduling equipment for shutdown (Fig. 1-9).

1.25 **Organizing.** You have tools, materials, and supplies available and are ready to specify job instruc-

tions. Standard operating procedures (SOP) apply to most major jobs. While job-by-job instructions are not required for routine and some major jobs, they are often necessary for unscheduled and emergency jobs. Emergency jobs are unexpected conditions that could result in injuries, equipment damage, product loss, or downtime. They will be finished faster if you personally direct the work. Ordinary unscheduled jobs are not emergency repairs. Your craftsmen can usually complete them without direct supervision.

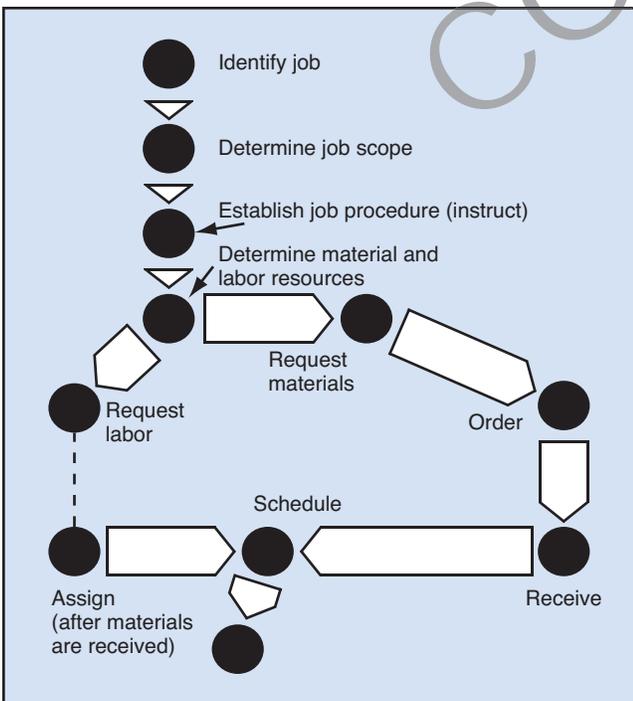
1.26 Obtaining labor and materials is a key activity. Choose needed tools, repair parts, and other materials from stock suppliers and special sources. Allow extra lead-time to get items not in stock. It would be easy to request labor if one supervisor was in charge, but that usually isn't the case. Often, labor is assigned to peak workloads and specific craft needs. To have workers available when you need them, make arrangements in advance and follow the facility's priority system. Expect that you may have to coordinate tools, transportation, and rigging each day.

1.27 When your craftsmen ask, "How will the job be done?" they expect an expert answer. As a first-line supervisor, you should be able to do a particular job well. Perhaps you feel you should be excused from instructing electricians because you're an expipefitter. It's a better idea to acquire necessary additional experience until you can instruct any craft personnel. Perhaps you're new on the job and just learning another craft. You may be inclined to answer even though you're unsure. The wrong answer may lose your crew's confidence. It's wiser to say, "I don't know what to tell you, but I'll find out."

1.28 **Staffing.** You have to know enough about a job to assign it to a particular craftsman. You also have to know what each worker can do before assigning him a task. Crew members soon lose confidence in the supervisor who assigns a mechanic, an electrician, and finally a hydraulic specialist to the same job. Before matching craftsmen to specific jobs, compare their abilities to the tasks. Then, expand the list of skills available as the crew gains experience working on different units of equipment and in meeting work standards.

1.29 Overtime increases job labor cost by at least 50% and should be used only when you know benefits will result, as in this example:

Fig. 1-9. Job preparation sequence



A plastics company stopped producing waste baskets while major molding equipment was overhauled. Repairs were made during overtime to shorten downtime. In management's opinion, the number of waste baskets produced in the time saved was worth many times the cost of overtime.

Follow organization policy guidelines when approving overtime and be sure to justify your decision.

1.30 Leading. The ideal way to relate instructions and demonstrate procedures is to instruct crew members on the job site. You have your equipment and blueprints at hand, and your workers are all present. Some major jobs require this type of detailed instruction, but you can leave routine jobs to the craftsman's judgment. Become involved in the instructions for serious, emergency repairs, even if the task is clear. Your presence will convey a proper sense of urgency—as will telling the employees you appreciate their efforts.

1.31 Most large jobs are costly because of the quantity of labor and materials needed. Any amount of machine downtime is critical to facility operation. Delays in returning equipment to use increases expense. As a first-line supervisor, you must try to overcome time and material problems. Manage the job, don't leave it to the craftsmen. Leadmen can offer only limited help. The most they can do is to direct several craftsmen while you are away from the site.

1.32 You should inspect a completed job personally. Since you gave the original instructions, you should be sure they were followed. When you make personal inspections, you also can check the quality of a craftsman's work and the skill level he has reached. Be sure to compliment work that merits praise.

1.33 Controlling. On the job, controlling means getting work done on time. Schedule major jobs to minimize downtime and consider linking job elements to save time. Many costs increase dramatically when a job is late. The most obvious cost is the loss of profit from a saleable product while production equipment is being repaired. Show your crew the importance of cost controls by stressing that work must be completed on time. Also, point out that PM services, if properly performed, can prevent equipment failures and downtime.

Fig. 1-10. Verifying report of labor and materials



1.34 Important company decisions regarding equipment replacement, overhauls, or modifications depend on your cost reports. When you submit a report of labor and materials used for a job, be sure it is accurate and reflects your opinion of the work (Fig. 1-10).

1.35 When reporting the costs of a job, remember that work quality is as important as the amount done (quantity). Was the work done well and will the repair stand up? Is this a quality job? The answers to these questions depend on your technical competence. If you don't have a high level of expertise yourself, you won't know what you're looking for when you check job quality.

Table 1-1. Maximize the time spent supervising

Activity	Average	Desirable
	%	%
Supervising, instructing, controlling	39	60
Planning, resources	8	15
Scheduling	5	10
Coordinating material needs	5	10
Checking time sheets	10	1
Preparing requisitions	10	1
Expediting parts	12	0
Preparing reports	5	1
Attending meetings	3	1
Phone calls	2	1/2
Inquiries	1	1/2

Fig. 1-11. Initiate a self-improvement program**Budget Your Time**

1.36 How much time should you spend actively supervising a crew to obtain maximum productivity? Generally, if you spend 60% or more of your time supervising, crew productivity will reach 40% or more (assuming a correct span of control and reasonable working conditions). You can see from Table 1-1, on the previous page, that a supervisor's varied activities use up his time. If necessary, rearrange your schedule so that you have enough time to supervise. After all, it's your principal activity.

Improving a Difficult Job

1.37 In your job, you are pressured by unsympathetic unions, demanding production and engineering departments, OSHA, untrained maintenance crew members, and economy-minded management. Identify the problem areas that concern you and try to solve them. Also, strengthen your relationship with the maintenance manager. Offer him information and a responsive attitude in return for an opportunity to operate independently.

1.38 Next, ask the maintenance planner to help you plan and carry out major jobs. Show the production supervisors how their understanding of the maintenance function can ease your job. The facility engineering and industrial engineering departments can help you in different ways.

1.39 Facility engineering uses maintenance crews for construction, equipment modification, and installation projects. Offer to support the department's projects if it will reduce its maintenance requests. Ask the industrial engineering staff to share their work method and standard evaluation procedures. These procedures can save you a lot of time if they are performed properly. Finally, try to reduce the time you spend checking time sheets and preparing requisitions and stock-issue forms, so you have more time for supervision.

Symptoms of the Supervisor in Trouble

1.40 Many pressures can interfere with a supervisor's work. The supervisor who fails to resolve these pressures is unable to finish a job on time. His crew must work overtime to balance the workload. The supervisor is either running out of materials or waiting for some parts that haven't yet arrived. He doesn't know his workers' productivity or machinery repair history and he's too busy to start a PM program.

1.41 How did he get into trouble? This supervisor began as a craftsman in a small facility. As the facility grew, he accepted more and more responsibility without adding background training or management experience. What are his options now? He can initiate his own self-improvement program, taking advantage of the many management training seminars and short courses available (Fig. 1-11). The company that once thought of him as poorly trained and indifferent will see a well-trained maintenance supervisor. He can also ask management to set certain policy guidelines. These would specify the importance of PM, planning and scheduling, and prescribe minimum controls for manpower and material costs.

PREVIEW
COPY

16 Programmed Exercises

1-9. Your personal supervision will often be needed for fast completion of _____ jobs.	1-9. EMERGENCY Ref: 1.25
1-10. To have workers available when you need them, make arrangements in _____.	1-10. ADVANCE Ref: 1.26
1-11. Overtime increases job labor cost by at least _____%.	1-11. 50 Ref: 1.29
1-12. The best way to demonstrate procedures is on the _____.	1-12. JOB SITE Ref: 1.30
1-13. You can leave routine jobs to the craftsman's judgment. True or False?	1-13. TRUE Ref: 1.30
1-14. You should _____ a completed job personally.	1-14. INSPECT Ref: 1.32
1-15. A report on the labor and materials used for a job is called a(n) _____.	1-15. COST REPORT Ref: 1.34
1-16. Try to _____ the time you spend on paperwork so you have more time to supervise.	1-16. REDUCE Ref: 1.39

Answer the following questions by marking an "X" in the box next to the best answer.

- 1-1. In order to identify the workload, you must take which of the following into account?
- a. Amount of work
 - b. Available time
 - c. Type of work
 - d. All of the above
- 1-2. To employ crew members effectively, you must
- a. be willing to do some of their work for them
 - b. have completely reliable workers
 - c. have highly specialized workers
 - d. know their capabilities
- 1-3. Your estimate of how long a job should take should become your
- a. cost report
 - b. efficiency quotient
 - c. job goal
 - d. manpower objective
- 1-4. If one of your workers turns in low-quality work, you should
- a. continually point out the worker's failures
 - b. fire the worker immediately as an example to others
 - c. provide training and point out any improvements in performance
 - d. suspend the worker until his performance improves greatly
- 1-5. While disciplining a worker, also use
- a. a labor relations representative
 - b. counseling
 - c. merit increases
 - d. the company's grievance procedure
- 1-6. The measure of how much work is done in a given time is called
- a. cost-effectiveness
 - b. manpower
 - c. productivity
 - d. workload
- 1-7. Overhauls and other major jobs may
- a. need the help of a planner
 - b. require hiring additional workers
 - c. require the equipment to be shut down
 - d. all of the above
- 1-8. Emergency jobs are unexpected conditions that
- a. are normally handled whenever repair equipment is free
 - b. can usually be handled by standard operating procedures
 - c. rarely require supervising
 - d. should be personally supervised
- 1-9. When an ex-pipefitter supervises electricians, he should
- a. allow one of the crew members to supervise electrical maintenance work
 - b. bring in a planner to instruct the crew
 - c. learn enough about electrical work to direct the job
 - d. rely upon his crew members' background
- 1-10. Which of the following may be duties of a facility engineering maintenance crew?
- a. Construction
 - b. Equipment modification
 - c. Installation
 - d. All of the above

SUMMARY

When you calculate a workload, know the kind of work needed, how much is to be done, the level to which it will be performed, how often, and how much manpower is required. Once you know the workload, specify, budget, and control the labor, tools, and materials needed. The crew's objective should be to perform all PM work on time, expand scheduled maintenance, decrease emergencies and unscheduled repairs, and reduce downtime.

Productivity lags when a crew waits for tools or parts, clear work orders, or needed craftsmen.

Approve overtime only when you are sure it will benefit the organization. Overtime increases job labor costs by 50% and should be approved within the company's policy guidelines.

Your role in cost awareness is to see that work is completed promptly. The amount of time you spend actively supervising your crew relates directly to productivity. Expect that you will spend 60% or more of your time supervising your crew's activities to assure 40% or more productivity.

Answers to Self-Check Quiz

1-1. d. All of the above. Ref: 1.02

1-2. d. Know their capabilities. Ref: 1.05

1-3. c. Job goal. Ref: 1.09

1-4. c. Provide training and point out any improvements in performance. Ref: 1.13

1-5. b. Counseling. Ref: 1.14

1-6. c. Productivity. Ref: 1.17

1-7. d. All of the above. Ref: 1.24

1-8. d. Should be personally supervised. Ref: 1.25

1-9. c. Learn enough about electrical work to direct the job. Ref: 1.27

1-10. d. All of the above. Ref: 1.39

Contributions from the following sources are appreciated:

Figure 1-3. Hope Aero Propeller & Components

Figure 1-5. PacMoore Products, Inc.
www.pacmoore.com

Figure 1-10. TPC Training Systems