Fire Control Training in the U. S. Forest Service
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Introduction

This material was collected, analyzed, digested, and rewritten by the author in hopes that he could gain a general knowledge of fire control training in the U. S. Forest Service. Books and periodicals were liberally perused, numerous interviews were conducted, and much thinking was done in the preparation of the ensuing thesis. The author's background in training practice included both the part of trainee and trainer in the guard training set-up. Beyond that, the word of others who are more experienced had to be relied upon. Visits to the Regional Office in Portland and the Forest Supervisors' Office of the Willamette, Siuslaw, Columbia, and Mt. Hood National Forests helped to give much of the past activities and future trends of fire control training. The ensuing bibliography lists the various published works that were consulted in preparing this paper.

The Training Problem in General

In this day of progress, any organization that allows its physical equipment to become obsolete will soon find itself in difficulty. Any organization, wither business or governmental agency, that allows its brain power to become stagnant may well consider its man power obsolescent. It is not the employees that progress with the organization; it is the organization which progresses as the employees progress. A few far-sighted executives do not carry the entire burden of an enterprise; they distribute this burden by the judicious use of men and machines.
Tools of many kinds are required by manufacturing organizations in order to meet productive requirements. Complicated operations are accomplished by means of tools, but the performance of these tools must be checked. When standard tools cannot be adapted to a process, special tools are designed and constructed. Similarly, in meeting the job requirements of a company or government service, various types of individuals are required; varying amounts of adjustment must be made before the individuals are ready to fill the positions for which they were employed or to which they have been transferred. This adjustment can be assisted by an adequate follow-up to determine the success with which employees are performing their jobs, and by the introduction of training methods with which to develop their abilities.

The many thousands of dollars spent in developing new and highly specialized equipment must be accompanied by more intensive development of highly skilled workers if this equipment is to be utilized economically. There can be no let-down in training of personnel, in ever seeking for new means of employee development. New positions created by new operating methods offer a challenge to employees and management alike.

Training, or educating, new employees in the tasks to be performed is merely giving them foundation on which to build. It may help those who are trained to fill their positions more capably, but what they learn from formal training is no more the measure of progress than a college education is a measure of success in life. All employees must continue to learn by subsequent training or by new experiences offered to them as a proper supervision of their development.

In launching a program of training, it is first necessary to study the various types of training in common use before it is possible to determine their adaptability to the conditions existing in the particular organization concerned. The details will undoubtedly have to be changed to fit the circumstances, but there are certain basic questions that must be answered before any training course can be adopted. These are:
1. What is the purpose of this type of training? What objectives can be attained by it? Is it needed?

2. What particular jobs lend themselves to a formal training course, or what classes of employees should be trained before being assigned to any specific work?

3. What method of conducting the course best suits conditions?

4. What records should be kept to show (a) the cost of conducting the course, (b) the employees' progress on the course, and (c) a measure of the results?

In order that a clearer picture may be attained of the training problem in general a short discussion of training of new employees and training of experienced employees is included.

New employees stationed uninstructed at their positions cannot be expected to start functioning properly. When all that is required is to tell the employee what to do, the instruction consists mostly of explanation. When it also becomes necessary to show the employee how to do the work, it is because there is an acquired ability called for which can be obtained only by experience. Training new employees serves to accelerate the aptitudes or experience, particularly where these can be obtained only by constant repetition. The field of training new employees lies somewhere between jobs that require simply an outline of the tasks and those jobs that can be learned only step by step until skill is obtained in all of them. Generally speaking, training should not be necessary on those jobs for which experienced workers can be hired, nor on jobs where individual initiative is required. There are two objectives \(^1\) to be attained in the systematic training of new employees:

1. The preparation of beginners for specific jobs that cannot be filled with experienced workers.

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\(^1\) Baridon and Loomis, "Personnel Problems"
2. The general preparation of certain classes of beginners for future openings.

The cost of training new employees on a productive job can be estimated in a manner similar to that used in determining training costs as a part of the cost of employer turnover. The steps in estimating the cost are:

1. An analysis of the output records.
2. A comparison of this production with that of experienced employees, to determine the point at which the employee begins to earn what he is paid.
3. A proportionate share of the instruction and extra supervisory cost, extra overhead, extra breakage, etc.

The training of experienced employees is preparation for the future and for the development of a personnel qualified to meet the needs of the organization. This type of training differs from that used for new employees as it is developmental rather than instructional.

The need for such training depends largely upon the number of positions that cannot be filled by hiring, but to which employees must be promoted, particularly in the case of specialized jobs and supervisory positions. It is a long-term building up of a qualified group of experienced employees to compensate for the losses due to labor turnover, and to meet the needs of the organization due to growth, and the introduction of unusual operating features.

The means to this end are:

1. Out-of-Hour courses for those employees interested, which deal with the broader phases of the business connected with their work.
2. Special courses during work periods for selected employees.
3. Practical training by means of horizontal transfers or rotation from one job to another.

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1 - Baridon and Loomis, "Personnel Problems"
2 - Ibid.
Training in the U. S. Forest Service

Training of employees was first done in 1924 on a rather limited scale in a few western regions. At that time training was given to new guards, and the job was carried out on a district-wide basis. That is, each ranger was responsible for the training of the men who were working on his district. At that time few of the rangers had had experience in the training of men and as a result most of the early work was a mere explanation by the ranger of the jobs to be done. Some rangers attempted to conduct discussion groups with only mediocre success. The occasional inspection was often turned into a training job and in many cases this was the extent of the guard training.

It is well to point out here that all the early training was pointed at the short term protective force. The training of year-long employees was not a consideration at that time.

In 1927 guard training was put on a forest basis and 3-day camps were held for the first time. This was the first attempt at organized group training. Most of the classes in the early camps were merely a demonstration with some practice in doing the work. Discussions were confined to evening meetings and the daylight hours were spent working on demonstration fires. The main consideration was fire suppression. Work was also given in locating fires by following compass lines and pacing. In other words the early guard schools stressed the "doing jobs," as they were called, and such things as law enforcement, public relations, and care of quarters were not included. However, satisfactory results were accomplished in that the rangers who were doing the training knew their subjects very well. Methods may have been poor, but knowledge of the subject was good.
After three years of guard camps the Forest Service found that it was burdening its rangers too much with training problems. As a result the experience of guards was called upon to help out with the training of new men. In 1930 experienced guards were used in the guard training camps. While the amount of material absorbed by the trainees in those early camps may have been slight, their main value lay in the building of morale within the organization. This value has always been a major accomplishment of the guard schools, and for many years has been recognized by the Forest Supervisors as being of utmost importance to the smooth working of the protection force.

Training of year-long employees of the Forest Service started in 1928. The first training took the form of a series of discussions participated in by the fire assistants of each forest, and conducted on a regional basis. A few months later a week-long meeting was held for a number of staff men of the various forests. This meeting took the form of discussion sessions and covered timber management and grazing. In 1934 the first of the month-long training schools was held. Three or four men were sent from each forest to this school, and lectures, discussions, and demonstrations were given on all subjects that concerned the men participating. These training schools have been held in a central point in the region, and in Region 6 the Hemlock R. S. in the Columbia National Forest has been used. These training schools have been held annually in some regions, but in Region 6 they have been given but once every two years.

CCC training started immediately upon its organization and has been an integral part of the work of that organization. The same can be said of the E.R.A. organization. Training has been an important part of the activities of that group.
The experience gained by the forest officers at training camps indicates that certain principles are fundamental to effective fire training. Some of these principles are herein discussed.¹

1. Training is based on the job. Teach the man to do the things he has to do. It all comes down to two questions: What does he do? What must he know?

2. Teach only one thing (step operation) at a time. Things not essential to that subject detract. Do not go on to a new subject until the first is well completed.

3. Men will normally do good work if they know how.

4. Show them how. First demonstrate, then test them.

5. This involved:
   
   (a) An objective, a clear-cut idea of just what you want to put across. Usually tell the trainee what it is.
   
   (b) Preparation, detailed on your part. Some advance preparation of the trainee is advisable when practicable. Have all work well laid out in advance, and have decision made as to how to take it up with trainees to best advantage.

6. We learn through our ears, eyes, and muscles. Use all three where possible. This means tell them how, show them how, have them do it, and give it to them in writing (at least a tickler list) as a reminder, and for their future review.

¹ - Fire Control Handbook, Region 3, U.S.F.S.
Training Methods

The methods of presentation that may be employed when training in groups include the demonstration, the lecture, the recitation, the working out of a project, the analysis of a case or a problem, a group discussion under the leadership of a trainer, or some combination of these. There is apparently no best way; but if the true nature of the learning process is appreciated by the trainer, he will be likely to place a minimum of reliance upon lectures or any other form of relatively passive learning. A word about the limits upon each of these methods may be helpful.

A demonstration is one of the best ways of beginning the learning process. Usually it is best to preface the demonstration by some explanation of what is about to be done and why and how. The demonstration helps the visually-minded learners and those whose powers of abstraction are undeveloped.

The lecture enables the teacher to present new matter in a highly selected, orderly, and logical manner. Much related reading can be digested by the lecturer and ideas not yet in print can be presented. On the other hand, much lecturing involves the presentation of material available in books which should be studied by the student himself. The learner is too passive under most lecturing to obtain any other result than the usual "in one ear and out the other". Broadly speaking, the printing press and mimeographing process should have rendered the lecture all but obsolete in training techniques many decades ago.

The recitation by itself often degenerates into a mere verbal exercise in memorizing what someone else has thought or said about the subject. In those frequently met instances where training also implies ability to use information in action, the recitation is clearly an inadequate tool. There are other ways of assuring that each member of a training group is mentally...
involved in the instruction that is going forward which are not quite so parrot-like in character. There is a further risk that under recitations both teacher and students will gage success by good recitations, rather than by bona fide proficiency in action.

The project method means that the trainee is assigned a task or project to perform or carry out. To be useful, this method requires prior information by the student of methods of investigation and of the results which he is, in general, expected to find. It requires careful supervision; but if that is assured, the student can usually gain much from this kind of experience. Projects have the advantage of requiring active self-instruction.

The case method may involve the discussion in class of a pre-studied case. If the case really illustrates the matter under consideration, if it really presents all the necessary relevant facts, if the trainee has some background as to principles and related experience, then his analysis and solution of the case can be effective training experience.

Various combinations, that is, lecture and discussion, lecture and recitation, or some other combination is often used. Training methods are as varied as their instructors who are using them, and while each of the various methods produces something in the way of results some are certainly to be preferred over others. However, a variety of techniques is always needed.

The above methods are in a general way the methods used in all training. However, the Forest Service has adopted two training methods that are especially adaptable to fire control training. These two methods are the "4-step" method and the "dramatization." Actually they have adopted some of the above discussed principles, but because of their special application they are included in this discussion.

1 Much of this material is taken from the "Guard Training Handbook", U. S. Forest Service.
The Four-Step Procedure is adapted to a large part of the fire control training job. Examples of where this procedure may not apply are lessons in Public Contacts, Law Enforcement.

The Lesson: What is a lesson? In its simplest sense a lesson is a teaching job, or instruction unit. In teaching practice the term "lesson" is used to designate the entire procedure followed in teaching or "putting over" some specific thing.

a. The aim must be specific. The subject of the lesson determines the whole subsequent procedure and hence must be given first consideration — that is, it must be specific.

b. The learner must be ready for that particular lesson. Whatever the aim or the content or the method of a given lesson, it can only be taught effectively at a certain point in the learner's progress and development.

c. The content must be teachable: By this is meant that it must be possible to thoroughly accomplish the aim of the lesson under the proposed working conditions. Thus it is desired to complete the lesson in a certain time or place, or by certain methods. Don't undertake to teach too much in one lesson.

d. The instructing process is a series of four steps:

   Step 1 - Preparation
   Step 2 - Presentation
   Step 3 - Application
   Step 4 - Testing (or inspection)

In the final application of these four steps the instructor directs but the trainee does the work of thinking or doing. What the learner gains is by virtue of his own activity—mental or manual—and from the mental or
manual activities of another he gains nothing. The instructor guides the train of thought to the aim of the lesson.

**Step I - Preparation:** The preparation step in the teaching process deals with the teacher's act in getting the learner into a mental state of expectancy towards the process or job which he is to learn. It involves the act of raising in the learner's mind the query "How do you do it?" and "How is it different from what I already know?" It is a "mind centering" process by which the learner is caused to bring up in his mind all the information which he possesses about the subject that is to be taught. The situation is ideal when the learner reaches the point of desiring to acquire the knowledge or skill.

In this step the instructor takes the initiative, the method selected and the time necessary to put it across is a matter of good judgment. Even in the simplest lesson there is a need for step I; its omission will increase the difficulty of learning. People learn easier if they can see a reason for learning, or if there is a personal advantage in knowing or being able to do.

Preparation must be complete before presentation is started. Preparation gives no additional or new information.

**Step II - Presentation:** In this step the instructor puts across the new lesson material by use of some suitable method; this is best accomplished by "tacking on" the new ideas to what the learner already knows.

**Step III - Application:** In this step the learner is given an opportunity to do the job which was presented to him in Step II. If he has difficulty, the instructor gives him assistance. The instructor should not consider leaving Step III until he is reasonably certain that the trainee has learned the lesson.
Step IV - Test: If the instructional process has been properly carried on up to this point the instructor is ready to take a chance that the learner has been properly taught, and if he is right the teaching job is finished, the learner is instructed, he can do what the instructor intended that he should be able to do or he knows what the instructor intended that he should know. The teaching unit has been put over and the teaching process is at an end. At this step the instructor must now stop being an instructor and, becoming an inspector, proceed to inspect the results of his teaching. In some suitable way the ability of the learner to do the entire job alone must be tested.

Comments on the 4-Step Procedure

A lengthy address is not necessary for carrying out Step I - preparation. Suggestive questioning is the most satisfactory method of accomplishing Step I in the minimum time; capitalize on the need or value for learning.

"Sticking to the Job" in Presentation: All that is proposed to present to the learner in the way of new ideas or knowledge is given during this step in the lesson, and it is necessary that this should be a clean-out piece of work. Nothing should be considered during this step which is not included in the instruction meant to be taught in that particular lesson. Head off irrelevant discussion and conversation.

Effective Order in Presentation: In this step of the lesson a series of ideas must be presented to the learner, and these ideas must be presented in the most effective order, this order having been previously determined. An efficient teacher will pay a great deal of attention to using an effective order in presentation and the failure to do this is a very common error of untrained instructors.

The question of Emphasis: Emphasize the more important ideas. It takes skill and practice to pick out the important points.
Limited Content: Most instructors err on the side of trying to include too much in the subject of one lesson. If a given thing is to be taught, it is far better to cut it up into a series of small lessons than to undertake to teach one elaborate lesson. For example: The main topic, "Map Reading, should consist of several short lessons. Arrange these short lessons, or teaching units, in the most effective learning order from the simple to the more complex; considering the main topic of "Map reading" again, the lesson on "Size and legal description of full townships" should precede that on "Fractional townships."

In steps II and III, the instructor should ask questions so worded as to require definite answers and stimulate thinking concerning the lesson. The poorest way for the instructor to find out if the class has the idea or understands is to use these questions:

1. Is this clear to you all?
2. Do you all understand this now?
3. Are there any questions?

There is an unappreciated value in repetition, necessary in a great many cases in carrying out Step IV; it fixes the idea in the trainee's mind. Often a slight change in the situation will make the test more effective and interesting.

THE DRAMATIZATION PROCEDURE

This procedure is particularly well adapted to group instruction in certain topics such as some of those lessons presented by the subjects of law enforcement and public contacts. Next to learning by doing, learning by seeing a thing done is the most effective.

A dramatized lesson consists of a portrayal of a specific case, real or hypothetical, in which all of the factors involved in the lesson are set forth. The subject matter should be confined to the actual or probable,
avoiding the unusual or improbable. The effectiveness of the lesson will be in proportion to the skill with which it is enacted. Ability to act is not essential, but the ability to appear natural and at ease before an audience is necessary. The element of facetiousness, or horseplay, should not be employed. Its use can seldom be justified and it usually detracts from the effectiveness of the lesson by diverting attention to non-essentials.

In the dramatization procedure there are three distinct parts:

1. A dramatic presentation which includes a mixture of wrong and right practices, or questionable methods, ending with major points unsolved. Some one person in the group should be especially designated to take notes, both for the current discussion and for future reference in improving the lesson.

2. A conference discussion, using the Conference Procedure, in which all of the factors involved in the case are brought out, discussed and points decided.

3. Second dramatic presentation showing the proper way, correct methods and right answer to all problems involved.

The second presentation is for the purpose of emphasizing correct practice and erasing from the minds of the trainees any wrong impressions they may have acquired.

In preparing the lesson plan, two stories of the case should be outlined, one for the first presentation, and one for the second. Using new characters and locale for the second presentation might add to the interest, but it is felt that there would be a loss in psychological value. Therefore, it is suggested that the same characters, factors and locale be used in both sketches, the first showing the effect of negative or wrong methods, with perhaps a few proper points; and the second showing the constructive or ideal way of handling the situation. See Part III of this handbook for written lesson plans under the Dramatization Procedure.
Applied Training For The Year-Long Force

The training of supervisors and their staffs will be extended through:

1. Group fire schools
2. Supervisors' meetings
3. Personal attendance at as many fires as possible
4. The holding of annual forest personnel training camps in which they will take an active part
5. Critical analysis of past fires.

Supervisors are conversant with and guided by all valuable fire-control data that are issued from time to time and have an intimate knowledge of conditions on their own forests, supplemented by the careful analysis of local fire statistics.

Forest rangers are trained by:

1. Study of approved fire practices and discussions with other forest officers.
2. Training schools, group conferences, and guard training camps.
3. Assignment to fires being handled by others.

Perhaps the most vital factor is not only the recognition of the need for training, but also the acceptance of the responsibility for training by those in charge of fire-suppression work. Much of the necessary training can be given only by those "in command." Possibly we need to go back of our overhead failures on fires and check up on the officers under whom personnel were trained for deficiencies in executive ability and skill in training.

A great spread exists between what is known and what is practiced in corralling, controlling, and mopping up of fires. Part of this is the result of following established habits of work; part is the result of failure to think.
Training to date has been largely concentrated on the "doing" end of suppression work. The training of overhead involves primarily instruction in analytical and critical thinking in fire suppression. This is a harder, slower task, because it calls for the conscious guidance of the mental reactions of the trainees. Greater progress will be made when thinking is more closely coordinated with doing in corralling and controlling fires.
Guard Training

In its present state of development guard training has been the cause for more concern than any of the other phases of Forest Service training. Each year there is considerable turnover in guard personnel which requires an additional amount of training to that of other groups of personnel. Considering these facts, more space has been given to guard training than any of the other phases.¹

Responsibility for Training. On each forest the responsibility for training is definitely assigned to some individual. In most cases this is the staff officer responsible to the Supervisor in fire control activities. In this capacity the individual becomes the training officer in fire control subjects for the forest. It is his responsibility to:

1. Assist rangers in analyzing the training needs of the short-term protective organization.
2. Decide field of training:
   a. Group training subjects.
   b. Training in place subjects.
   c. Follow-up training subjects.
   d. Pre-camp training subjects.
3. Program the training job.
4. Arrange for and supervise training camp set-up.
5. Select instructors, assign teaching topics, supervise lesson planning, and train instructors to teach.
6. Set up and maintain a record of training accomplishments.
7. Conduct of camp, establish class periods and other necessary camp schedules, and see that they are followed. Instruct camp boss in his duties. Observe teaching practices and see that the course of instruction is given smoothly and effectively.

¹ Much herein presented is also contained in the "Guard Training Handbook," USFS
8. Check on follow-up and place training practice.
9. Assist the ranger in giving place and follow-up training.
10. Maintain cost record for group training.

Other staff officers have definite training responsibilities with relation to the short-term protective organization. In connection with inspection and general supervision they will find many opportunities to give training in place and follow-up.

The District Ranger is directly responsible for the training of his men. That is, he determines the training needs of the men, sees that they receive camp instruction, and does most of the follow-up training.

The protective assistant or dispatcher can do considerable follow-up training by telephone. Other short-term men are seldom given training responsibilities except for minor details. Qualified short-term men can sometimes be used to advantage as instructors in group training.

**Setting Up The Training Program**

The basis for the entire guard training program is an analysis of individual training needs. As soon as possible after the short-term personnel have been selected for the ranger district, the district ranger, with the assistance of the Training Officer makes this analysis.

As previously discussed, training may be given by some combination of the following:

a. Pre-camp
b. Guard training camp
c. In place.

The training officer and the district rangers must have an understanding as to what subjects can be taught prior to the guard training camp and what subjects can be taught in place. The important thing to keep in mind is not to try and crowd too many subjects in the guard training camp program.
GROUP TRAINING

Programming the Guard Training Camp

The first step in programming the guard training camp is the preparation of an "Analysis of Guard Training Needs" for the entire forest. This may be done by combining the needs of the several ranger districts. The lesson topics as set up in each section will probably vary on the different forests in the region.

The second step is the preparation of the Master Program for each of the three days. This may be somewhat complicated by variations in individual's training needs, necessity for proper sequence of subjects so that elementary lessons precede advanced lessons.

The third step is to make out the instructor's program for the three days. Each instructor should know what subjects he will be expected to teach, size, and experience of the class, in ample time prior to the guard training camp, so that it will be possible for him to make adequate preparation.

The fourth step is to make up the individual trainee's program. The trainee's program gives the lesson topics, meeting place or location for each class, the class time and the day. The trainees should be given their individual three-day program at the first morning assembly. The meeting place or location for each class should be marked or numbered by some suitable method, and all of this thoroughly explained during the first morning assembly.

In setting up the time schedule in the Master Programs, the last five minutes of each hour is definitely allotted for changing from one class to another when necessary. Unless the trainees move promptly from one class to the next, some of the instructors will be short on their allotted time.
Topics, such as Law Enforcement, Public Contact, etc., are programmed for evening sessions. By so doing, 2 to 4 additional daylight hours are available for training in fire fighting and suppression.

The last hour of the third day is scheduled for a meeting of the men from each ranger district with the District P. A., for the purpose of answering questions, clearing up problems, etc., that may have come up during the three-day program. Experience has shown that men will ask questions of the P. A.'s which they would hesitate to ask the district rangers. The conference also develops a friendly feeling between the P. A.'s and the men he will work with, and directs them to him as the one they can go to for help.

The effectiveness of the entire training program depends on adequate, thorough preparation. The training officer and the instructors should plan on being at the guard training camp the day before it opens, for the purpose of giving their lesson plans, teaching materials, and field problems a final check to make sure that everything is complete and ready to go.

It is desirable to plan for a certain amount of play in connection with the guard training program; however care must be exercised so that sports do not interfere with or overshadow the serious business of training.
TEACHING TOPICS ARRANGED IN SECTIONS

MAIN TOPICS AND TEACHING UNITS

Section A. Fire Prevention

1. Law Enforcement
   State and Federal fire laws and regulations
   Local closures and restrictions
   Designated Forest camps
   Authority in law enforcement
   Recognition of industrial hazards
   Serving Forms L.E. 1 and 2
   How to assist in removing hazards
   Collection of evidence and handling cases
      (Six points involved)
      a. Camp fire case
      b. Closure violation case
      c. No Smoking, or Axe-Shovel-Bucket case
      d. Permit required violation case

2. Public Contacts
   Personal appearance
   Appearance of quarters
   Issuing permits
   Giving information to public
   Use of give-away material
   Use of auto tags
   Building a campfire
   Extinguishing a campfire
   Teaching public in fire prevention
   Inspecting a tourist camp
   Contacting camper groups
   Cooperating with public

3. Care of Field Stations and Camps

Section B. Tools, Equipment, and Quarters

1. Care and use of small tools
   a. Hazel hoe
   b. Axe
   c. Shovel
   d. Pump can
   e. Pulaski tool

2. Use of falling tools

3. Tool assemblies
   a. Fireman's outfit, assemble and check
   b. Tool caches, assemble and check
   c. Use of tool cache list

4. Special equipment
   a. Torches
   b. Gas and electric lights

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1 - Guard Training Handbook quotation
a. Psychrometer  
d. Rain gauge, anemometer  
e. Base meter

5. Communication  
a. Use of telephone line tools  
b. Battery hook-up  
c. Telephone hook-up  
d. Grounds  
e. Telephone protection  
f. Telephone troubles  
g. Emergency splice, #9 wire  
h. Use of emergency wire  
i. Radio set-up  
j. Radio operation

6. Quarters  
a. Care of quarters sign  
b. Fire protection  
c. Rodent protection  
d. Closing for season  
e. Equipment readiness - outfit, car, horse, report forms  
f. Station maintenance  
g. Station sanitation

7. Packing  
a. Horse packing  
b. Back packing

Section C. Detection  
1. Operation and Care of the Firefinder  
a. Setting up firefinder  
Place map on instrument  
b. Leveling instrument  
c. Sighting  
Reading azimuths  
Reading vertical angles  
d. Orienting instrument  
e. Learning country with firefinder  
f. Estimating location and distance  
g. Measuring width of fires  
h. Care of instrument  
Minor repairs

2. Check look system

3. Forms and records  
a. Use of lookout report - reporting fires  
b. Lookout Manual  
c. Lightning storm report
4. Observing storms  
   Reading and recording strikes

5. False smoke record

6. Weather Instruments, Observations, and Records  
   a. Rain gauge and stick  
   b. Psychrometer and tables  
   c. Anemometer  
   d. Haze meter  
   e. Wind direction  
   f. Condition of sky  
   g. Recording observations

7. Mirror flashing

8. Powder signaling

9. Care of lookout station

10. Training other lookouts

11. Orienting firefinder at night

Section D. Fire Chasing

1. Maps and surveys  
   a. Mapreading, inexperienced men  
   b. Map reading, experienced men  
   c. Use of maps, orientation by landmarks, locating position  
   d. Field markings  
   e. Use of panoramic pictures  
   f. Topographic maps  
   g. Knowledge of country, geography, hazard, transportation routes

2. Pacing

3. Compass and Use (Elementary)  
   a. Parts of the compass and care  
   b. Magnetic declination  
   c. How to hold and read  
   d. Turning 90° angles  
   e. Running compass course and pacing  
   f. Compass Review

4. Getting on Lookout's line of sight to find fire  
   a. Correlation of map and ground location problem  
   b. Getting on Lookout's line of sight problem

5. Locating fire from known point on road or trail

6. Locating fire by 2-point intersection
7. Gridiron method

8. Explanation and use of Tangent offset

9. Use of Fireman's protractor
   a. Mapping Lookout's Line of Sight with Fireman's protractor
   b. Locating Position with Fireman's Protractor

10. Finding fire by panoramic pictures.

Section E. Fire Suppression, Small Fires

1. Initial action
   Sizing up burning material
   Weather
   Topography
   Draft and wind direction
   Volume of work
   Tools, number of men, where to get men
   Point of attack

2. Line construction
   Location of line
   Type of line
   Control methods
   Spot fires
   Line clean-up

3. Mop-up
   Snag cutting
   Reduction of volume of fire by water, dirt, moving material
   Recording line hazards by burning out hot spots and mess and reproduction clean up
   Determining when fire is out

Section F. Forms, general

1. Log and diary
2. Campfire permit
3. Receiving Lookout report, recording information on map
4. Telephone diagram or map
5. Organization maps
6. Fireman's report
7. Contracts of hire, authority to hire
8. Job lists
Section G. Advanced Training

1. Teacher training

2. Dispatchers, Protective Assistants
   a. Lookout summaries
   b. Platting
   c. Panoramic photos in dispatching
   d. Use of base plans
      i. Use of detection plan
      ii. Hazard map
      iii. Status record
      iv. Organization map and chart
   e. Executing fire plan
      i. Fire responsibility
      ii. Emergency fire plan
      iii. Dispatching suppression force
      iv. Hire and routing trucks and pack stock
      v. Calling in follow-up crew
      vi. Checking fire progress
      vii. Dispatching follow-up crew
      viii. Handling supplies and equipment orders
      ix. Keeping fire records currently
   f. Contacting short-term force
      i. Routing schedules
      ii. Use of guard job lists
      iii. Lookout orientation
      iv. Follow-up training
   g. Assembling ad checking caches
      i. Testing station fire equipment
   h. Office contacts with public
      i. Giving information
      ii. Issuing permits
      iii. Handling law enforcement cases
   i. Switching, communication system
   j. News notes
   k. Miscellaneous forms and records
      i. Office log
      ii. Form 929
      iii. 10-day fire report
      iv. Weather records and observations, sending to field
      v. Industrial and false smoke record
      vi. Use of Forms L.E. 1 and 2
      vii. Fire equipment lists
      viii. Purchase order and requisitions
      ix. Compensation forms
      x. Property transfer
      xi. Special Forest forms
   l. Systematic work methods
      i. Work devices; notes, promise cards, job-lists, office neatness
      ii. Daily work planning; job grouping, job concentration, job completion
      iii. Routing mail, supplies, equipment to field
      iv. Correspondence procedure
      v. Accounting procedure
Section G. Advanced Training (Cont.)

3. Timekeeper
   a. Time slips, time books, regulations and pay schedules
      - How to get time from line
      - Labor, stock, and equipment contracts
      - Commissary
      - Compensation forms and cases
      - Use of 877
      - Use of timekeeper kit
   b. Ordering supplies and equipment
      - Assembling and returning surplus equipment
      - Estimating fire costs
      - Reporting fire progress
      - Maintaining satisfactory sanitation and health

4. Camp Boss
   a. Responsibility to chief
      - Organizing and supervising camp force
      - Camp arrangement
      - Ordering and distributing men
      - Establishing and maintaining communication
      - Establishing and maintaining transportation
   b. Instructing and checking timekeepers
      - Assembling and recording fire accounts
      - Commissary accounting
      - Compensation
   c. Ordering and distributing supplies
      - Checking and estimating needs for supplies
      - Ordering and distributing tools and equipment
      - Checking and estimating tools and equipment needs
      - Reconditioning
      - Returning surplus

5. Strawboss
   a. Responsibility to foreman
      - Correlation of men and tools with work
      - Proper order of line work
      - Lining men out on work
      - Instructing men
      - Line timekeeping
      - Keeping sufficient water for men, lunches
      - Recognizing and guarding against danger
      - Caring for injured men
      - Adjusting work with fire behavior
      - Handling emergency situations
   b. Methods of line construction
      - Keeping fire out of snags
      - Handling spot fires
      - Holding line with petrol
      - Line clean-up
      - Snag falling
      - Backfiring
      - Mop-up
      - Care of tools on line
      - Return of surplus tools
Section G. Advanced training (cont.)

6. Foreman-Crew Boss
   a. Responsibility to fire chief
      Relation to camp boss
      Recognizing physical factors
      Judging fire behavior
      Estimating work and planning attack
      Recognizing water or plow chances
      Correlating work and men needed
   b. Organizing and equipping strawboss or foreman crews
      Instructing strawbosses or foremen
      Locating line
      Spot fire detection
      Handling spot fires
      Recognizing critical points and shifting crews
      Line construction methods
      Handling emergency situations
      Tying work together
      Night conferences with strawbosses or foremen
      Checking on patrol and holding of line
      Checking on line clean-up
      Checking on mop-up
      Safety precautions
      Return of surplus tools

7. Fire Chief
   a. Fundamentals of organization
      Assembly of fire facts
      Use of scouts
      Correlation of fuel, weather and topography with fire behavior
      Recognizing critical points
      Selection of points of attack
      General plan of attack
      Volume of work
      Division into camp units
      Men and equipment needed
      Selecting and organizing fire line and behind-line organization
   b. General planning of work
      Supervision and inspection of subordinates
      Correlation of work on entire fire
      Recognizing, planning for, and meeting emergency conditions
      Daily conference with subordinates
      Assembling, recording and mapping fire progress
      Deflation of fire force and equipment

8. Scout
   a. Travel over fire
      Use of high points for observing
      Observation and recognition of physical factors
      Noting water and camp sites
      Noting natural barriers
   b. Sketching and recording observations
   c. Judging fire action
      Probable points of attack
      Probable plan of attack
      Estimating volume of work
Section G. Advanced Training (cont.)

9. Pumper Operator
   a. Natural and artificial intake basins
      Mechanics and care of pumper
      Pumper troubles and repair
      Set-up and operation
      Tandem hook-ups
      Condition, check, and assembly of outfit

10. Hose Crew
    a. Crew organization
       Gravity system intake basins
       Gravity hose filling
       Stringing hose
       Location of hose line
       Use of siamese and reducers
       Cooling down fire with nozzle
       Working line with nozzle
       Mopping up with nozzle
       Segregating broken hose
       Rolling or coiling hose
       Cleaning and drying hose
       Assembling hose units

11. Plot Crew
    a. Crew duties
       Packing equipment on horse
       Handling the plow
       Recording accomplishment

12. Killefer Crew
    a. Crew duties
       Loading Killefer unit
       Care and use of Cat
       Use of Killefer
       Recording accomplishment

13. Mop-up on Project Fires (Conference)

14. Recognizing hazardous burning conditions

15. Cooperative Crews
    a. Duties and responsibilities
       Lining up men
       Contracts of hire, wage schedules, conditions of work
       Hiring transportation, rate schedules
       Purchase of supplies and equipment
       Knowledge of country, transportation routes, hazard
Section H. General

1. Opening talk
2. Closing talk
3. First aid
4. Fire plan conference
5. Handbook conference
   a. Hours of work on improvement and fire suppression
   b. Job list
   c. Report time -- daily routine
   d. Elapsed time standards
   e. Night travel
   f. Firefighting objectives and policies
6. Law enforcement skits
7. Public contact skits
8. Eyesight tests, color and target
The several Forests have organized and handled their guard training camps in different ways.

Some have developed the fire camp method in which conditions represent a project fire camp. Others have adopted the improved camp system, where better accommodations are provided. Some Forests have used one central camp and other two or more camps. Some have changed camp locations from year to year while others have developed and utilized permanent camp sites.

For various reasons a central, improved, permanent camp is most desirable. Some Forests, however, may find it necessary because of differing periods of employment on different parts of the Forest, or because of high transportation cost, to hold more than one camp. The central, improved, permanent camp provides closer supervision and better control, least lost time in assembling men, better learning conditions because of more comfortable accommodations, adaptability of camp improvements for conference meetings, more orderly assembly and distribution of materials, more effective use of instructor’s time, ability to conduct classes in certain subjects because of the concentration of men, least time required for laying out problems and other preliminary arrangements, and advantages from repeated use of field problems and camp improvements during subsequent training periods.

Camp Planning.

Construction of improvements and the laying out of problems permanent in character should be made according to a well-developed plan insuring the best usage for amount expended over a period of years. In preparing such a plan, space allowance for various improvements and activities should be given careful consideration. Following is a reminder list for preparing a plan for a training camp layout:
Reminder List - Training Camp Layout

Quarters for trainees (by squads)  Parking space
Quarters for instructors  Recreation court
Quarters for visitors  Flag pole
Quarters for campboss  Toilet
Quarters for kitchen help  Garbage
Place for camp equipment and supplies  Road
Place for subsistence supplies  Water system
Kitchen  Washing facilities
Covered mess with tables and benches  Warming fire
Place for conference meetings  Water heating facilities
Headquarters problems  Field Problems

The Camp Boss

The training officer needs assistance in handling detail both before and after and during the camp period. The following list indicates a number of activities which may be delegated to a campboss:

1. Lay out problems
2. Set up and break camp
3. Order and check supplies.
4. Distribute and keep record of tools and equipment
5. Supervise kitchen force
6. Attend phone calls
7. Dispatch messages
8. Keep check on sanitation
9. Keep time of men and training camp cost records
10. See that parking rules are observed
11. Attend flag
12. Check camp policing.

Supplies and Equipment

All material and equipment needed for teaching should be listed and assembled in advance of the training camp. The main source of information for material needed is the lesson plans. This material should be delivered to the campboss, who will be custodian of same, to be kept at one central place ready for distribution as called for by instructors.

Lesson material such as charts, blackboards, and other special teaching devices which can be used year after year should be designed and built for permanent rather than temporary use.
Problem Layout

Space for the various classes should be laid out so that the teaching of one group will not interfere with the teaching of others. Places for charts, blackboards, and other necessary equipment should be selected in advance so as not to delay the program. Where transportation is available it should be remembered that proper location of problems is of enough importance to justify hauling men considerable distances. Many problems can be laid out with permanent field markings and sketches made to be used from year to year.

Conduct of Camp

Instructors should adhere closely to camp schedules. When not engaged in teaching, they should keep fully occupied in assisting other instructors or in preparation of lessons. Trainees will be quick to notice apparent idleness.

During times when the trainees are not engaged on scheduled program work, some form of recreational activity is considered desirable. Also within a lesson requiring mental concentration with little physical activity, a break should be made with a short recreational period. Another benefit derived from recreational activities is development of a group spirit which is desirable in the organization.

Considering the fact that the men who will attend guard training camps have been hired for their dependability and good conduct, it is considered better practice to test their character and rely upon their honor rather than to set up disciplinary rules and demand their observance. A few simple rules to insure best utilization of training time sometimes are necessary.
Personnel Rating

Grading of trainees at the group camp must be restricted to Four-Step lessons. Lessons taught under the Conference or Dramatization procedures cannot usually be checked for actual learning accomplishment until the trainee is contacted in the field.

The qualifications for any job in the short-term organization may be classified under one of four broad headings:

a. Ability
b. Understanding
c. Attitude and conduct
d. Accomplishment

Grading in the field is essentially the responsibility of the district ranger. If time does not permit him to grade all his men he may delegate some of this work to staff men to be done in connection with inspection. Inspectors, other than those to whom the ranger has delegated this work, should not grade. When grading a job or item, it should be thought of in terms of ability, understanding, attitude, conduct or accomplishment according to the classification most applicable. Grading on a basis of 1 to 10 permits a spread within the grades of failure, fair, average, good, and excellent. This is desirable inasmuch as it permits a record of advancement within grades in recognition of improved work.

PLACE TRAINING

The analysis of training needs shows that each man needs to be taught a list of subjects. Certain of these were selected for group training. There usually remain several important training needs which can be given in place. The most important part of place training should occur at the time a man first enters on his duties. Also, whenever a protective man is replaced during the season, a job of place training exists.
Most place training must be done personally by the ranger or assistant ranger. Occasionally the ranger may be given assistance by Forest staff officers. The job, however, is too important to be delegated to short term instructors except in minor details. The protective assistant can be assigned some of these minor details for telephone training. In rare instances a lookout or other qualified guard may be able to give a new man some initial training before the ranger's arrival. Road camp foremen, when qualified, may sometimes assist by teaching their men how to read maps or use a compass. All employees should accept responsibility for training men under their supervision on fire suppression work. Generally speaking, all assistance given the ranger in place, training activity must be as delegated by him, and it should be kept in mind that such help be limited to jobs which the ranger cannot take care of personally.

FOLLOW-UP TRAINING

Follow-up training is defined as a drill or a test in which no new material is introduced. Subjects previously taught, either at group training camps or in place are reviewed. Things in which the trainee is weak are gone over. Since follow-up training is so closely allied with inspection the need for much of it will be disclosed thru this medium. Follow-up training may be conducted thru personal contact, by telephone, by correspondence or as a job assignment.

From grades given at group training camps, or as the result of training in place the district ranger should determine, in so far as possible, the follow-up training needs of his men. When this is done a definite program for its accomplishment should be prepared. Since much of the inspection of the short term force by the ranger must be done in connection with other administrative duties he may not be able to contact all of his men before
the season is advanced. In preparing the program he should plan to do as much of the follow-up training work as he possibly can. For those jobs which he cannot reach in time he should arrange for definite training assignments for staff men, and from his own force delegate certain follow-up training jobs to qualified short term men. Protective assistants may accomplish much of this training over the telephone. Improvement crew foremen, if qualified, may accomplish some of this work within their crews if need be. All of this training, however, should be specifically authorized by the district ranger and carefully checked by him.

Written tests may be used as a means of follow-up training. Such tests will stimulate thinking on the part of the trainee and refresh his memory and fix the subject more firmly in his mind. They are also valuable as a means of determining training needs.

Perhaps the most effective way of conducting the written test, as a means of training, is to prepare a set of questions covering the requirements of each job. These questions may then be submitted to men in like positions, with the request that they be answered and returned to the district ranger within a certain specified time. Upon receipt of the papers they should be graded. From all of the papers, the one best answer to each question should be selected, listed separately and this list returned to the trainee with his own graded paper.

Each trainee will recognize his own work when listed as the best. Since this has a stimulating and encouraging effect, the best answers should be selected from as many papers as possible. In case a correct answer is not received, the question should, of course, be answered correctly by the grader.

This, in effect, is the conference procedure, reduced to correspondence.
Job assignments are perhaps one of the most effective means of obtaining lasting results. Here a trainee learns by doing the thing he was taught to do. Its application is limited to opportunities for assignments. Protection men should be assigned to jobs involving the things they have been taught whenever opportunity is presented.

PRE-CAMP TRAINING

It is desirable to give a new man a general picture of his job before he attends camp, and equally desirable to give the experienced man a review of his work before the season starts. In general, this is the field that can be covered in pre-camp training.

Pre-camp training is particularly effective during the period in the spring when protective men are employed on Forest Service maintenance work. Under these conditions it is sometimes possible for the ranger to give some direct training, or at least to delegate minor training jobs to qualified foremen or others.
A sample guard training plan and inspection outline, which was adopted in 1939 by Region 6 in order that there would be a closer coordination of training practices on the many districts throughout the region may be found in the original thesis (call no. 3.1).
Training of Cooperators

Adjacent to many National Forests there are areas belonging to private owners who relinquish the responsibility of fire protection to the Forest Service by paying a patrol tax. These lands are often occupied by people interested in the fire protection problem. They often feel a real interest in protection beyond merely paying the patrol tax and abiding by the fire laws. In many cases these settlers are organized into crews for suppressing fires, and now they have come to be known as "coops." It often happens that these men suppress fires on their own or their neighbors land and for this reason they take a special interest in the problem. These crews are organized into units that comprise 20 to 40 workers with one of the local men acting as foreman. In the case of a fire the District Ranger calls the coop foreman and gives him directions and orders regarding the fire. The foreman then calls his crew members and as many as needed go to the fire and work under a forest officer.

The training of these crews is a responsibility of the District Ranger. The objective in training these men is the improvement of the efficiency of the operation of these crews. Even though most of them are farmers or loggers and are acquainted with manual labor, it is necessary to train most of them in fire fighting methods, organization, standards, and use of special equipment.

The methods that are used in training these coops are varied and as one training officer has said, "There are as many methods as there are rangers responsible." Some District Rangers don't attempt to have a formal training period, but merely call the group together for a dinner or banquet and then include fire control training in the program of the meeting. These rangers realize that the men are contributing much to fire control and that the Forest Service must cooperate in the matter by furnishing more than just the
wages of the men. Other rangers have made it a policy to send coop foremen to the guard training schools. The foreman is then expected to help his crew members do better work and he will also improve his own techniques of fire control. Another method of training coops is to hire local people as much as possible for suppression work and thus they will become better able to do good work on subsequent fires. This is the technique used by some rangers in the Ponderosa Pine region and has proved quite effective. As compared with the other phases of training, "Coop" training is but a small part of the major job. As a result, expenditures for this purpose are limited, and the time allotted to the job is also relatively small. However, results from this training have been quite good on the districts where "Coops" are used.
Future Trends in Forest Service Training

During the past year or so many of those responsible for fire control operations have been seriously questioning the training programs, the methods, and the accomplishments. As one fire assistant has put it, "We spend thousands on training during the first of each fire season, and then have to fight just as many fires during the season as has been the case for many years. We seem to have as many mistakes now as we had when little or no training was given." This criticism is being heard in many quarters. At a recent meeting of fire assistants in Portland this question was seriously considered. At that meeting a new interpretation of training was discussed in hopes that more could be accomplished with training funds. The idea of "supervised training" was presented. This involved more of the actual doing of each job under the supervision of an experienced employee. In this way the trainee would "get the feel" of doing the job and would probably accomplish more than the usual wordy discussion. The criticism has been that many words have been used in training without sufficient results on the job. For this reason "experience clinics" have been recommended for most "doing" jobs.

This particular issue is foremost in the minds of most training officers at present, and very likely the 1980 season will see some application of this idea of "on-the-job" training provides a shortcut to information and experience.
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