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ABSTRACT

This instructor guide contains four lessons to be used in a course for Support Assistants for Fire Emergencies. The course is arranged by class sessions of three hours each, with each session divided into two or more sections. Each lesson plan has the same format: Course Title and Number; Objectives; Instructional Aids; Selected References; Suggested Films; and Main Topic with Teaching Points. Lesson plan number 1 covers the following: Course Introduction; Modern Weapons and Radioactive Fallout; and The Role of the Fire Service in Civil Defense. In lesson plan number 2, Basic Concepts of Fire Behavior, Techniques of Fire Prevention and Fire Limitation, and Fundamentals of Fire Suppression are the subject areas. The topics covered in lesson plan number 3 are Portable Extinguishers; Use of Portable Extinguishers; Miscellaneous Equipment; and Evacuation--Rescue--First Aid. Lesson plan number 4 concludes the course with Shelter Fire Guard Organization and Function; Shelter Fire Guard Operations; and Course Summary. It is recommended that students be given the opportunity to participate in the course as much as possible. (DB)

IG-9.2A (instructor guide)
July 1971

Firefighting for Civil Defense Emergencies

SUPPORT ASSISTANTS FOR FIRE EMERGENCIES

INSTRUCTOR GUIDE — PART A

Developed for The Office of Civil Defense
by The International Association of Fire Chiefs

FIREFIGHTING

For

CIVIL DEFENSE EMERGENCIES

SUPPORT ASSISTANTS FOR FIRE EMERGENCIES

INSTRUCTOR GUIDE-PART A

IG–9.2A — July 1971

Developed for the Office of Civil Defense
by the
International Association of Fire Chiefs
Development Committee

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INTRODUCTION

General

This guide has been developed use in presenting Part "A" of the course of instruction for Support Assistants for Fire nergencies. It is arranged by class sessions of three hours each. Each of the sessions is divided into two or more sections covering specific subject areas. The coverage given each lesson is not exhaustive, but is meant to serve only as a basic foundation for the class sessions.

The intention is to include in Part "A" instruction which would enable Support Assistant personnel to be immediately useful in limited roles, and to include in Part "B" instruction which would extend his capabilities, make him more generally useful, and keep up his interest.

Firefighting terms and practices vary somewhat across the nation. Where there are local or area variation in terms and practices the instructor should bring this to the attention of the students.

It is suggested that where at all possible this course be supplemented by the Part "B" course, as well as by additional training in first aid.

It is further suggested that regular firefighters can profit from instructions in the subject matter covered in the lessons on "The Role of the Fire Service in Civil Defense," "Modern Weapons and Radioactive Fallout," and "Shelter Duties."

Selection of Instructors

Arrangements should be made to have qualified fire service training officers serve as instructors. Other qualified personnel, such as radiological monitor instructors, can be of assistance in presenting certain lessons. *Personnel selected as instructors should not only be qualified in a particular skill, but should also know how to instruct.*

Training Auxiliary Personnel

The quality of training resulting in this course will depend upon (1) the number and caliber of people receiving the training; (2) the ability of the instructor to maintain their morale and interest; and (3) the backing and enthusiasm shown for the course by local fire and Civil Defense officials.

This guide has been designed to serve as a guide to the instructor in a relatively wide range of situations. In no instance should this guide serve as a sole source of information for the instructor, nor should he use, or quote it, as a sole authority in any given subject area.

The instructor should carefully review each lesson plan in this guide to understand its exact objective as well as the source of its material. He should supplement each lesson with appropriate reference materials, and suitable examples appropriate to his particular locality. Local organizational charts, staffing patterns, operational procedures, and forms should be made a part of the lessons. The instructor should be constantly alert for subject matter which may need revision due to advance in firefighting practices, as well as changes in Civil Defense requirements.

At various places throughout the Lesson Plans notes are given in parentheses for the guidance of the instructor. They should not be used as part of the presentation to the class.

Also, suggested visual and other aids to be used with corresponding lecture materials will be noted under the main topic headings where necessary.

For each section of the Lesson Plans a time period has been suggested. These time periods may vary with the individual instructor, the amount of local information added, and the size of the class where skills development is suggested. No breaks have been specified, but it is suggested that where the sessions are mainly lecture, the students be given a ten minute break each hour.

Students should be given the opportunity to participate in the course as much as possible to enhance their interest. They should be encouraged to ask questions and express ideas. The instructor, however, should be alert and diplomatically cut off the long-winded relating of personal experiences which have little bearing on the subject matter. Class discussions can be very fruitful when they are carefully guided by the instructor.

Teaching Aids and Equipment

Training aids, references, and suggested handout materials are listed in the Instructor's Guide. The Local or State Civil Defense Office can provide current C.D. publications, and the local fire department may provide the reference sources listed.

A number of large illustrations are included at the back of the Instructor's Guide. If the instructor has an overhead projector available, he may make transparencies from these illustrations, or he may use them with an opaque projector. Sets of 2 x 2 slides may be available of these same illustrations.

For the sections of the class on "Fire Behavior" the instructor should plan to include small table demonstrations. Wherever the lesson includes discussion of the fire department tools or equipment, these should be available as teaching aids.

LESSON PLAN NO. 1

COURSE TITLE AND NUMBER: Firefighting for Civil Defense Emergency— Part A

Section I—Course Introduction
Section II—Modern Weapons and Radiocative Fallout
Section III—The Role of the Fire Service in Civil Defense

TIME: 3 hours

OBJECTIVES:

To acquaint the student with the nuclear fire problem and the role of the Fire Service in coping with the problem. To show the student his role in Civil Defense emergencies and teach him the measures necessary to protect himself and other people from the effects of fallout during nuclear emergencies.

INSTRUCTIONAL AIDS:

Chalkboard, chalk, and eraser

Slide projector

Dosimeters, 1 per trainee, as available:
1. CDV–138 2. CDV–730 3. CDV–740 or CDV–742

CDV–750, Dosimeter Charger, one per class, as available
Survey meters, one per class, as available:
1. CDV–700 2. CDV–710 or CDV–715

SELECTED REFERENCES:

a. Instructor's:

The Effects of Nuclear Weapons, DA Pam 3903, 1962, ARC and DOD, Chapter XI, for sale by the Superintendent of Documents, USGPO, Washington 25, D.C.

In Time of Emergency, H–14, March 1968.
Manufacturers' instruction and maintenance manuals, as appropriate.

b. Student's:

Manual—*Firefighting for Civil Defense Emergencies—Part A* (Safe A)
Fire Prevention and Control in Civil Defense Emergencies—Federal Civil Defense Guide, Part E, Chapter 10, with appendices 1 and 2, June 1969.

SUGGESTED FILMS:

Design for Disaster (Shortened version)

About Fallout, DOD/OCD 3–220—24 minutes

MAIN TOPIC	TEACHING POINTS
I. SESSION INTRODUCTION—10 min.	
Reasons for C.D. Preparedness	A. The possibility of nuclear attack (many lives can be saved with advance planning by C.D.). B. Natural disasters.
Responsibility for C.D.	C. The responsibility for C.D. must be shared by everybody. 1. Federal—Guidance and funding. 2. State—Planning and guidance. 3. Local—Planning and operational preparedness. 4. The individual. a. Responsibility to himself. b. Responsibility to the community.
Fire Service Role in C.D.	D. Survival under atomic attack would depend on all segments of our economy and government. Each segment would have specific roles. 1. Day-to-day role of Fire Service. 2. Fires caused by nuclear attack would overtax existing Fire Service. 3. Fire Service would need to concentrate on those activities most vital to national survival. 4. Fire would be a threat to those who survive the nuclear blast especially where it might burn or cause evacuation of shelters for protection from fallout.
Training Objectives	E. The objectives of this course are: 1. To educate citizens on extent of fire threat. 2. To teach basic fire defense preparations. 3. Teach basic fire fighting.
Scope of Support Assistants for Fire Emergency (Safe) Training	F. The "Support Assistants" Part A course. 1. Four three-hour sessions. 2. This course is designed to train citizens in urban areas to suppress small fires stemming from nuclear attack, assist firemen as needed, and help defend community shelters from fire. 3. Emphasize that Support Assistants have been recruited and trained by and will be under command of regular fire forces. G. The "Support Assistants" Part B course. 1. Eight three-hour sessions. 2. Extend the Support Assistant's capabilities and qualify him to lead small groups in the suppression of fires from nuclear attack. 3. Consists of more actual work with fire protection equipment.

MAIN TOPIC	TEACHING POINTS
II. MODERN WEAPONS AND RADIOACTIVE FALLOUT— 2 hours	
Section Introduction	A. This lesson deals with the following topics: 1. Importance of the subject matter. 2. Types of weapons and effects. 3. Fire potential of nuclear weapons. 4. Nuclear radiation. 5. Effects of nuclear radiation 6. Detection of nuclear radiation. 7. Protective measures.
Importance of Subject Matter	B. In order to protect himself and be useful in fire control during a nuclear attack the Support Assistant for Fire Emergencies must know something about the fire potetnial and nuclear radiation of atomic weapons.
Weapons	C. Types of weapons. 1. Conventional. 2. Nuclear.
Fire Potential	D. Types of bursts.
	E. Effects of weapons (nuclear). 1. Blast. 2. Heat. 3. Nuclear radiation.
	F. Fires will be started by the heat radiating from the fire ball. 1. Distance. The distance from ground zero that fires may be started will depend on three factors. a. Size of burst. b. Height of burst. c. Atmospheric conditions (clear, fog, rain). On a clear day an air burst of a 20 megaton weapon could ignite fires 25 to 30 miles from ground zero. 2. Number of fires. The number of fires a given weapon may ignite will depend primarily on the nature of the fuel exposed to the flash of heat. The duration of the heat is quite short and dry tinder-like fuels would be most easily ignited.
	F. Fires started by disrupted services. 1. Electric lines shorted. 2. Gas mains broken. 3. Heating and cooking fires scattered.

MAIN TOPIC	TEACHING POINTS
Nuclear Radiation	G. Initial radiation. Of little consequence since the blast and heat will most likely kill all individuals within range of the initial pulse of nuclear radiation. H. Residual radiation (fallout). 1. Explanation of radioactive particles produced by H-bomb which fall back upon the earth from the upper air. Composed of material drawn up by force of explosion and contaminated with radioactive products of the bomb. 2. Heavy concentration might cause death. a. Learning about it, how you can protect yourself, and carrying out the instructions of your C. D. officials, you can minimize possible injury from fallout. You should respect it, but not fear it. b. Civil Defense officials can determine: (1) Where probable fallout areas will be. (2) Where radioactive areas exist. (3) When you need to take the protective measures you will learn in this session. I. Nature of nuclear radiation. 1. Nuclear radiation emitted by radioactive materials cannot be detected by the human senses. 2. Without radiological instruments we could not know of the degree of the hazard from fallout. 3. Hence, radiological instruments and people trained to use them are needed to measure, record, and report radiation doses and dose rates. 4. Types of radiation. a. Alpha. b. Beta. c. Gamma. 5. Certain instruments (those that measure rate) are operated only by trained radiological monitors who should be members of, or attached to, fire units. 6. The monitor may measure the exposure dose of each unit member or each fire fighter may have an instrument (his personal dosimeter) which will measure and indicate his total radiation exposure dose. 7. A fire fighter should not interrupt fire control or lifesaving mission until the radiological situation demands it. 8. The fire fighter should not undertake a lifesaving mission in the presence of radioactive fallout which would run up his total dose beyond permissible limits. (The fire fighter does not always determine the limits.) 9. Every fire fighter must know what his exposure dose is and keep a record of it. 10. This leads up to the objective of the lesson—to familiarize the trainee with the purpose and use of his personal dosimeter and

MAIN TOPIC	TEACHING POINTS
	with means and measures he can take to keep his radiation dose at a reasonably safe level.
Effects of Nuclear Radiation	J. Symptoms: 1. Radiation from fallout causes damage to body tissue. Over a period of time the body is able to repair most of this damage. 2. Observable symptoms of radiation sickness are: nausea, vomiting, diarrhea, fever, listlessness, and a general feeling of fatigue. Some or all of these symptoms may appear within the first three days. They may then disappear, reappearing after a week or so, sometimes accompanied by diarrhea and swelling of the nasal passages, mouth and throat. 3. Generally speaking, the greater the dose, the earlier the symptoms will appear and the more severe and lasting they will be. 4. Nausea and vomiting are not reliable indications of radiation injury. They are nonspecific symptoms in that they can be produced by pain, fright, and other emotional factors as well as diseases other than radiation injury. Nausea and vomiting can only be evaluated in terms of the estimated radiation exposure of individuals and in relationship to other symptoms of radiation injury. 5. One of the most important changes in the body caused by gamma radiation is the decrease of both white and red blood cells. From laboratory tests, this becomes noticeable at about a 50 r exposure and becomes progressively more severe as the exposure dose increases. It is a major cause of death within the lethal range of exposure. 6. Severe reduction of white blood cells increases the susceptibility to infection and internal bleeding. Infections that would ordinarily be warded off may become fatal with high radiation exposure. 7. A sufficiently great decrease in red blood cells will result in a loss of energy and strength. K. Short-Term Effects. 1. In considering the possible effect on the body of gamma radiations from external sources, it is necessary to distinguish between a short-term and a long-term exposure. 2. In a short-term exposure, the radiation dose is received within a relatively short interval of time. It is not possible to define a short-term dose precisely, but it may be somewhat arbitrarily taken to be the dose received during a 4-day period. If the whole radiation dose is not received in a short-time period, but over a prolonged period, then the exposure is called long-term. 3. The importance of making a distinction between long-term and short-term exposure lies in the fact that, if the dose rate is not too large, the body can achieve partial recovery from injury due to radiation while still exposed.

MAIN TOPIC	TEACHING POINTS

4. Large short-term exposures may cause serious sickness or death, depending on the size of the dose and on individual susceptibility, except that very large doses are invariably lethal.
5. Small daily doses can be tolerated over a long period of time. The total amount received in this fashion without causing any illness may be many times greater than the short-term dose which causes illness.
6. Fallout produces the greatest short-term exposure hazard during the first few days to two weeks after fallout arrival. This is the period when dose rates will be the highest. (NOTE: a dose rate curve can be used to illustrate the high dose rates of the early fallout period.)
7. The severity of effects on individuals exposed to the same dose will vary widely. However, the following descriptions may be used to estimate short-term effects on humans of external gamma exposures of less than four days.
   a. Short-term dose of 50 r—no visible effects. Laboratory tests show a decrease in blood cells. Exposed individuals should be able to perform their usual duties.
   b. Short-term dose of 75–100 r—brief period of nausea on day of exposure in about 10% of the group. The decrease in blood cells continues but is not a severe threat to survival. Exposed individuals should be able to perform their usual duties.
   c. Short-term dose of 200 r—as many as 50% of this group may experience some of the symptoms of radiation sickness. Although only 5% to 10% may require medical attention, no deaths are expected. Blood changes are sufficient to cause increased susceptibility to infection and a feeling of fatigue. If there are no complications due to other injuries or to infections, there will be recovery in essentially all cases. The illness from radiation doses at this level does not, generally, present a serious problem in that most patients will suffer little more than discomfort and fatigue, and some may have no visible symptoms at all.
   d. Short-term dose of 450 r—serious radiation sickness in most members of this group, followed by death to about 50% within two to four weeks. Blood changes become very severe, resulting in a tendency to bleed in various organs and for small hemorrhages to form under the skin. Bleeding in the mouth and intestinal tract is likely to occur. The victim is susceptible to complicating infections from wounds, burns, cuts and other breaks in the skin. If the victim survives, a temporary loss of hair, (epilation) may occur two to three weeks after exposure.
   e. Short-term dose of 600 r—serious radiation sickness in all members of the group followed by death to almost all mem-

MAIN TOPIC	TEACHING POINTS
	bers within one to three weeks. Symptoms of nausea, vomiting, diarrhea, loss of appetite, and malaise develop rapidly and are severe. Blood changes become very great, resulting in very high susceptibility to infection and internal bleeding. An increase in body temperature, probably caused by infection, is common and usually continues until the day of death. 8. The harmful effects of fallout taken into the body may be long delayed and are not readily recognized. H. Beta Burns. 1. Beta burns may result from significant amounts of fallout remaining in direct contact with the skin for long periods of time. Early symptoms include itching and burning sensations which may soon disappear. 2. After two weeks or more, there may be a loss of hair, which will return in about 6 months. Development of darkened or raised skin areas or sores appear within one or two weeks depending on the severity of the burn. 3. Severe Beta Burns. a. Healing takes place over a period of a few months. By taking simple precautions to prevent heavy contamination on skin surfaces, and by decontaminating when necessary, individuals can be protected from such burns.
Detection of Nuclear Radiation	A. General. 1. Since nuclear radiation can cause serious injury or death, its detection is of major importance in civil defense. 2. Nuclear radiation is invisible, and as it penetrates the body it can cause damage without causing pain. A person cannot see or feel (or detect it by any of the senses) nuclear radiation and, therefore, must rely on radiological instruments to determine its presence. 3. Instruments must provide two kinds of information needed for the evaluation and determination of the radiological hazard. The first of these is the intensity of the radiation field or the dose rate; and the second is the total exposure dose received by an individual, or the dose. 4. This information is essential to radiological defense officers and fire officers and fire officials in providing guidance for conducting emergency operations. For example, it permits the calculation of permissible entry and stay times for personnel in contaminated areas, and it provides an objective means for withdrawing personnel who may be nearing a serious or critical exposure to nuclear radiation. It is also useful in anticipating the severity of radiation sickness. 5. No single instrument has been designed to provide both kinds of information required for civil defense; therefore, this infor-

mation must be collected by separate instruments. Those which measure dose rate are called *survey meters.* Those which measure total exposure dose are called *dosimeters.*

6. Survey meters measure dose rate, they are calibrated in roentgens per hour (r/hr), or milliroentgens per hour (mr/hr). Dosimeters which measure dose rate are calibrated in roentgens (r) or in milliroentgens (mr). The dosimeter and survey meter may be compared to an automobile speedometer. The survey meter indicates the radiation dose rate in roentgens per hour and is like the speed indicator which registers the speed of the automobile in miles per hour. The dosimeter indicates the radiation dose in roentgens and is like the odometer which registers the total number of miles that the automobile has travelled.

B. Survey meters.

(*NOTE: The instructor should merely identify these, or what he has access to of these, instruments.*)

In this course we will be primarily concerned with dosimeter and the dosimeter chargers.

1. OCD-recommended survey meters include:
   a. Geiger-Mueller counter, CDV–700.
   b. Ionization Chambers.
      1. CDV–710 or CDV–715.
      2. CDV–720.
2. Use.
   a. To measure gamma dose rates in roentgens or milliroentgens per hour.
   b. Ranges.
      1. CDV–700 (0–50 mr/hr) beta-gamma discriminatory, for for personnel, and food and water monitoring.
      2. For operations.
         a. CDV–710 (0–50 r/hr).
            1 Detects and measures gamma only; does not detect beta.
            2 Used by civil defense workers in general.
         b. CDV–715 (0–500 r/hr).
            1 Detects and measures gamma only; does not detect beta.
            2 Used by civil defense workers in general.
         c. CDV–720 (0–500 r/hr).
            1 Used by emergency services—fire, police, rescue.
            2 Used for special high-level area surveys.
            3 Used to detect beta and gamma radiation.

C. The personnel dosimeter.

(*NOTE: Let the trainee examine the dosimeter(s) prior to explaining operation.*)

MAIN TOPIC	TEACHING POINTS

1. Description and function. Briefly describe and explain how the dosimeter functions. Demonstrate with the model(s) you have.
   a. As the firefighter performs his task in a radiation area, nuclear radiation will penetrate his body and the dosimeter he wears. The resulting hairline movement of the dosimeter is a measure of the dosimeter's exposure. So that if a person wears the dosimeter during exposure, it is assumed that his dose is the same as that measured by the dosimeter.
2. Types. Dosimeters recommended by OCD:
   a. For training; the CD—138 measures dosages from 0 to 200 mr.
   b. For operations.
      1. CDV–730, measures dosages from 0 to 20 r. It is used by civil defense workers generally.
      2. CDV–740, measures dosages from 0 to 100 r. It is used by emergency services personnel—police, fire, rescue.
      3. CDV–742, measures dosages from 0–200 r—an operational dosimeter.
      4. The CDV–730 and CDV–740 are no longer being procured by OCD. However, they should be used where they have been issued as operational equipment.

D. Dosimeter Charger, CDV–750.
1. Use and operation.
   a. Show the CDV–750.
   b. Some method is necessary to charge (zero) dosimeters prior to use.
   c. That is the purpose of this instrument—to permit us to recharge the dosimeter.
   d. Here is how we use it.
      1. A dosimeter charger is used to place an electrical charge on the indicating mechanism inside the dosimeter. This controls the movement of the hairline. When the hairline is on zero, the dosimeter is "zeroed."
      2. The CDV–750 dosimeter charge is used to zero all civil defense dosimeters. It has a charging receptacle and downscale-upscale control. The charger is powered by a single 1.5-volt flashlight battery, which operates the charging circuit and provides the light for illuminating the dosimeter scale. There are no internal adjustments to be made on the charger.
      3. To charge the dosimeter, remove the dust cover on the charging receptacle, press the dosimeter completely to the bottom of the receptacle and rotate the control knob until the dosimeter reads zero.
      4. All civil defense dosimeters are read by holding them about one-half inch from the eye and pointing them toward any light source sufficient to see the hairline.

IN TOPIC	TEACHING POINTS
	5. A dosimeter need not read exactly zero for it to measure exposure. It is possible to determine the dose for any selected period of time by subtracting the reading at the beginning of the exposure period from the reading at the end of the period. Thus, if a dosimeter read 20r at the beginning of a mission and 50r at the end, the fire fighter exposure was 30r. A dosimeter should be rezeroed after each use if it reads more than 25% of full scale. *INSTRUCTOR'S NOTE: Advise students that radiation detection instruments will be considered is more detail in the "Safe" B course.*
ive Measures	E. Radiation protection measures are based on the assumption that all radiation is harmful. However, experience and research have shown that if exposure is kept below certain generally established limits, medical care will not be required for the majority of people. Therefore, adequate methods and procedures for limiting radiation exposure and contamination must be established. Each fire fighter then, must learn when and how to employ radiation protection measures for himself and for any others for whom he is responsible. F. Radiation is emitted from fallout particles. The air through which fallout passes and the surfaces on which it settles do not themselves become radioactive. It is the radiation originating from these particles that constitutes the hazard to living things. G. External exposure to gamma radiation is by far the most serious threat to fallout survival. The reason is that gamma radiation: 1. Is not completely stopped by physical barriers (shelters, for example) and will travel great distances through air, and 2. Can penetrate living tissue to cause injury to all parts of the human body. H. If fallout remains on the skin it can produce beta burns that are slow to heal. This could be the second most serious hazard. I. If fallout is repeatedly ingested with contaminated food or water, it can cause damage to internal tissues. The threat to immediate survival from this source is not great, but it can become a serious threat to well-being in after years. J. Under most conditions fallout will not be inhaled in sufficient amounts to be a health hazard. K. If the presence of fallout is suspected before a fire fighter can complete his assigned mission; the following actions will help toward minimizing its effects. 1. Cover the head with a hat or piece of cloth or newspaper. 2. Keep all outer clothing buttoned (or zipped). 3. Adjust clothing to cover as much exposed skin as possible.

MAIN TOPIC	TEACHING POINTS
	4. Brush outer clothing periodically and at other times, as appropriate. 5. Continue on his mission or take shelter, as practical. L. Following an outside mission after the arrival of fallout: 1. Brush shoes, and shake or brush clothing to remove contamination. This should be done before entering a shelter area. 2. Go to the pre-selected location that will be used for personnel monitoring. Monitor the clothing after brushing and shaking to determine if further decontamination is necessary. Continue brushing and shaking until the CDV–700 indication is within safe limits. 3. Remove and store all outer clothing in an isolated location if contamination levels after brushing and shaking are too high to be measured with the CDV–700. 4. Wash, brush, or wipe contaminated portions of the skin and hair thoroughly being careful not to injure the skin. 5. Monitor the contaminated portions of the skin and hair to determine the need for further decontamination. Decontaminate until the CDV–700 reading is approximately equal to the background reading. M. When personnel leave sheltered locations for operations all possible protection measures should be taken to prevent contamination of these persons. Clothing will not protect personnel from gamma but it will prevent most airborne contamination from being deposited on the skin and hence will reduce the need for extensive washing or scrubbing of the body for prevention of beta burns. Most clothing is satisfactory; however, loosely woven cloth should be avoided. Instruct personnel to: 1. Keep time outside of shelters to a minimum in the presence of fallout. 2. Wear adequate clothing and cover as much of the body as practical. Wear boots or rubber galoshes, if available. Tie trouser cuffs over them to avoid or minimize possible contamination of the ankles and feet. 3. Avoid highly contaminated areas wherever possible. Puddles and dusty areas where contamination is probable should also be avoided. 4. Under dry and dusty conditions, do not stir up dust unecessarily. If dusty conditions prevail, a folded handkerchief or a folded piece of closely woven cloth should be worn over the nose to keep the inhalation of fallout to a minimum. 5. Avoid unnecessary contact with contaminated surfaces such as buildings and shrubbery. 6. Drivers using vehicles or assisting in monitoring operations should remain in the vehicle, leaving it only when necessary. To prevent contamination of the interior of the vehicle, all windows and outside vents should be closed when dusty conditions pre-

MAIN TOPIC	TEACHING POINTS

vail. Vehicles provide only limited protection from gamma, but they provide excellent protection from beta and will prevent contamination of the occupants.

N. Vehicles and equipment that are required for post-attack operations should be protected from fall-out contamination. When practical, all such equipment should be kept under cover in garage and warehouses or under covers of fabric or plastic. Windows and doors of vehicles and storage areas should be closed.

O. Each firefighter has a responsibility for limiting his exposure and for maintaining his own personal radiation exposure record(s). This is not an unguided individual determination. Radiation exposures of firefighters are likely to take a uniform pattern. After one period of low exposure, an operational mission may be followed by a high exposure. This may be followed by several days of relatively low exposure before the situation requires an additional heavy exposure. The only reliable method for keeping track of variable exposures is through the use of dosimeters and the keeping of complete exposure records.

P. In carrying out high-priority tasks exposures should, where possible, be more or less evenly distributed among operations personnel. Guidance for limiting exposure will be furnished by the radiological defense officer or other technically qualified civil defense personnel.

Q. Guidance for permissible activities will normally be furnished by the RADEF officer. However, if communications between fire units and the control center are disrupted, a monitor may be required to furnish guidance on permissible activities. When the outside dose rates are known, use the following as guides for operations activities. This is based on observations made on large groups of people and therefore should be used with caution with small groups. It is furnished only as a last resort guide. The data must be modified as early as possible, taking into account the age of the fallout.
   1. If the fallout is a recent arrival (2 or 3 hours old), greater control of outside activities will be required. Conversely, if the fallout is relatively old (several days or weeks), relaxation of control can be exercised, depending upon the outside dose rate.
   2. When the outside dose rate is less than 0.5 r/hr, special precautions are not necessary for operations activities. Keep fallout from contaminating personnel.
   3. When the outside dose rate is 0.5 to 2 r/hr, outdoor activity (up to a few hours per day) is acceptable for essential purposes such as: rescue, fire fighting, police activity, repairs, securing necessary food, water, medicine, blankets, important communications, waste disposal, exercise, and obtaining fresh air. Eat, sleep, and carry on all other activities in the best available shelter.

MAIN TOPIC	TEACHING POINTS
	4. When the outside dose rate is 2 to 10 r/hr, periods of less than an hour per day of outdoor activity are acceptable for the most essential purposes. Firefighters should rotate tasks to distribute exposure. 5. When the outside dose rate is 10 to 100 r/hr exposure should be held to a few minutes and limited to activities that cannot be postponed. 6. When the outside dose rate is 100 r/hr or more, outdoor activity of more than a few minutes may result in sickness or death. 7. Keep exposures as low as possible. Some emergency operations, however, may require exposure of up to 100 r during the first two weeks postattack or up to 200 r during the first month. Any exposure of this magnitude should not be undertaken without an appreciation of the risk involved.
Summary	R. Review the significant teaching points about: 1. The effects of nuclear radiation. a. Symptoms. b. Short-term effects. c. Beta burns. 2. Detection of nuclear radiation. a. The personnel dosimeter. *1.* Description of function. *2.* Types. *b.* The dosimeter charger. 3. Protective measures.
III. THE ROLE OF THE FIRE SERVICE IN CIVIL DEFENSE —40 minutes	
Section Introduction	A. This section deals with: 1. State fire defense plans 2. Local fire defense plans 3. Local fire department organization 4. Role of support assistants 5. Discipline in the Fire Service
	B. The role of the Fire Service during a nuclear emergency will depend largely on local conditions and operational plans drawn up by local Fire and Civil Defense officials. State and Federal Civil Defense officials can provide assistance and recommendations in planning and intelligence during a nuclear emergency but operational support will of necessity be largely a local or area function. The type of damage suffered by a given community will determine, or may alter, the role of the Fire Service in that area. The Fire Service may be able to assist in large scale rescue efforts or its full effort may need to be devoted to fire control.

MAIN TOPIC	TEACHING POINTS
State Fire Defense Plans	C. Obtain copies of the State Fire Defense Plan and explain to the student how this effects the local department.
Local Fire Defense Plans	D. Obtain copies of Local Civil Defense Emergency Operations Plans along with the fire defense annex and explain to the students how the fire plan fits into the total picture.
Local Fire Department Organization	E. Use the local fire department organizations chart: 1. Show chain of command for the line functions. 2. Explain the staff functions. 3. Show the liaison between the fire department and local Civil Defense
Role of Support Assistants	F. The role of the support assistant in Civil Defense fire emergencies will depend primarily on two factors: 1. Local fire department and Civil Defense officials. 2. The circumstances, or place where the individual "Support Assistant" finds himself at the time of attack. To report for a given assigned position; because of conditions, he may or may not be able to.
	G. Cite peacetime incidents where local or area fire control capabilities were fully committed or over taxed. Support assistants may be needed to: 1. Assist regular firefighting forces. 2. Suppress local incipient fires. 3. Provide shelter fire guard capability.
	H. Organization In all emergency situations Support Assistants will take direction from regular Fire Service personnel. This provides for: 1. Unity of command. 2. Experienced leadership.
	I. Assignments Support Assistants may be preassigned or directed at the time of an attack to these positions. 1. Support and assistance to shelter managers. 2. Assist regular Fire Service personnel. 3. Assist in Civil Defense fire prevention inspections. 4. Direct local fire suppression efforts on incipient fires in the absence of regular Fire Service personnel.
Discipline	J. Explain the need for the "Chain of Command" in the Fire Service. 1. To accomplish a mission. 2. To protect the individual firefighter as well as his fellows.
	K. Show how self-discipline effects the discipline of the entire department. 1. Following orders. 2. Reporting back to command. 3. Individual courage.

MAIN TOPIC	TEACHING POINTS
	4. Putting up with discomfort. 5. Wearing protective clothing. 6. Being alert for assignments or orders.
IV. SESSION NO. 1 SUMMARY	
Nuclear Weapons Effects	A. Blast
	B. Heat
	C. Fallout
Shelters	D. The importance of shelters
	E. Fire Service Role
"Safe" A Manuals Distribute	F. Suggest that the students review Chapter 2 of Support Assistant's A manual
	G. Announce next class session

LESSON PLAN NO. 2

COURSE TITLE AND NUMBER: Firefighting for Civil Defense Emergency—Part A

Section I—Basic Concepts of Fire Behavior
Section II—Techniques of Fire Prevention and Fire Limitation
Section III—Fundamentals of Fire Suppression

TIME: 3 hours

OBJECTIVE:

To give the student an understanding of basic fire behavior, fire prevention and fire suppression fundamentals.

INSTRUCTIONAL AIDS:

Overhead, opaque or slide projector

Selected visuals

Chalkboard, chalk, and eraser

Demonstration materials as available

SELECTED REFERENCES:

a. Instructor's:
Local and State Fire Training manuals as available.
International Fire Service Training Association manuals as available.

b. Student's:
Manual—*Fireghting for Civil Defense Emergency—Part A*
Fire Prevention and Control During Civil Defense Emergencies—Federal Civil Defense Guide, Part E, Chapter 10 with appendices 1 and 2, June 1969.

SUGGESTED FILMS:

MAIN TOPIC	TEACHING POINTS
I. SESSION INTRODUCTION—25 minutes	A. Review of previous session. Instructor's Note. Hold a class discussion to review Chapter 2. The following questions may be used to stimulate the discussion. 1. How would nuclear weapons start fires?

MAIN TOPIC	TEACHING POINTS
	2. What are some of the things that would determine how many fires would be started? 3. Why is fallout dangerous? 4. What are the symptoms of radiation sickness? 5. Does the body repair radiation damage? 6. How can nuclear radiation be detected? 7. What is the difference between a survey meter and a dosimeter? 8. Who should keep the records on an individuals radiation exposure?
	B. This session will be divided into three sections: 1. Fire behavior. 2. Fire prevention and limitation. 3. Fire suppression.
	C. The student needs a good understanding of the fundamentals of fire behavior in order to be ready for the next session which will deal with the use of portable fire extinguishers.
II. BASIC CONCEPTS OF FIRE BEHAVIOR—45 minutes	
	A. This lesson deals with the following topics. 1. Importance of the subject matter. 2. The fire triangle. 3. Products of combustion. 4. Heat. 5. Fire extinguishment.
Importance of Subject	B. To control any process, such as fire, it is necessary to understand that process. Amateur attempts by an individual to control or operate something he does not understand can lead to trouble. Fire was a mystery to early man and in some cases worshiped. The firefighter cannot afford to regard fire as something mysterious.
	C. The heat and products of combustion from a fire can kill. For his own safety the firefighter must understand these two effects of fire.
The Fire Triangle (draw triangle on chalkboard)	D. Illustrate the fire triangle and discuss the three factors. 1. Fuel. 2. Heat. 3. Oxygen.
(demonstrate)	E. Use small table demonstration to illustrate the fire triangle.
Products of Combustion	F. Combustion is the union of fuel with oxygen. Use the illustration of the combustion process to make the following points. 1. Matter is not destroyed or lost in the combustion process. 2. Heat is released in the combustion process. 3. With most ordinary combustibles the products of combustion are water vapor and carbon dioxide.

MAIN TOPIC	TEACHING POINTS
	G. When oxygen supplies are limited carbon monoxide will be produced. 1. Dangers of carbon monoxide. 2. Evidence, and treatment for carbon monoxide poisoning will be discussed in succeeding lessons.
Heat	H. Discuss Heat. Point out that cold is only the absence of heat. 1. Heat measurement. a. Degree F. b. BTU. 2. Heat transmission. a. Radiation. b. Conduction. c. Convection.
(demonstrate)	3. Discuss the heat for vaporization and ignition of fuels. 4. Ways of producing heat. a. Friction. d. Chemical action. b. Electricity. e. Spontaneous combustion. c. Compression. f. Others.
Fire Extinguishment	I. In the absence of one of the three factors represented by the triangle fire cannot exist. Use small table demonstrations to show: 1. Fuel removal.
(demonstrate)	2. Air exclusion. 3. Cooling.
II. TECHNIQUES OF FIRE PREVENTION AND FIRE LIMITATION— 40 minutes	
Section Introduction	A. This section deals with the following. 1. Importance of the subject matter. 2. Pre-emergency fire prevention. 3. Postattack fire suppression.
Importance of Subject Matter	B. The most efficient method of fire control is fire prevention.
	C. During periods of increased international tension fire personnel and Support Assistants may be asked by Civil Defense Officials or individual citizens to provide instruction and assistance in fire prevention measures.
Pre-Emergency Fire Prevention	D. Fire prevention is based on the fundamentals of the fire triangle. Most fire prevention measures are based on the fuel and heat legs of the fire triangle. We either eliminate the fuel or keep sources of heat away from the fuel. 1. Fuel removal. a. Rubbish removal. b. Store tinder fuels away from heat sources. c. Store flammable liquids in safe locations. d. Fireproofing treatment of materials.

MAIN TOPIC	TEACHING POINTS
	2. Heat control. a. Extinguish open fires. b. Extinguish heating and cooking fire of wood, charcoal, etc. c. Shut down of utilities (gas, electricity). The instructor should have a copy of local utility company directives with regard to shutting down utilities. Stress that utility shut down should be attempted, only, by qualified individuals.
	E. Thermal Flash precautions. Fires may be started and people burned by the thermal flash. This may be prevented by: 1. Moving people and fuels within buildings away from windows to locations where they cannot see the sky. 2. Covering windows with some kind of shielding material such as aluminum foil. Research on the nuclear fire problem indicates that the most important single fire prevention action during periods of international crisis is for householders to shield windows by keeping window blinds and shades closed, or by painting, coating, or otherwise covering the windows. There is strong evidence that most ignitions causing sustained fires would occur in the interior of rooms exposed to the heat flash of nuclear weapons. Ignitions caused by the heat flash would occur before blast damage to blinds or other coverings, and can thus be prevented in large part by covering the windows or closing blinds or shades prior to attack. Other important fire prevention actions include removing curtains, and recovering ignitable furniture from window areas. Plans for control of gas and electric utility service can reduce the incidence of fires caused by blast damage. Fire prevention actions of these types must be carried out in every building, including public shelters, in the jurisdiction, and require the cooperation of all citizens. Research indicates that the countermeasure of shielding windows—including closing blinds or shades—combined with other self-help fire prevention measures, in an effort requiring 8 man-hours per household could reduce the number of home ignitions by as much as 65 percent; and that a last-minute prevention program requiring only one-half man-hour per household could reduce ignitions by as much as 40 percent.
Postattack Fire Suppression	F. Pre-fallout. Following a nuclear burst there would be an interval of time before the arrival of fallout. This interval could be from 30 minutes up to several hours. Careful priorities should be enforced during this period. The missions most important for survival should be undertaken first. 1. Suppression of fires: There could well be more fires started than might be controlled

MAIN TOPIC	TEACHING POINTS
	in the short time available. Speed is essential in responding to the nuclear fire threat. Stress the vital importance of promptly suppressing ignitions in occupied structures—removal or extinguishment of ignitions is not difficult or time consuming—but this must be done within 5 to 10 minutes after the nuclear burst, before the whole room is afire. Fallout would not normally begin until 20 or 30 minutes after the burst, which would permit citizens to extinguish ignitions before taking shelter. Obviously, regular firefighters could not be present to suppress promptly all of the hundreds or thousands of ignitions which could occur. Therefore, citizens must do so. Crisis-period preparations by citizens include such actions as having garden hoses connected and ready for use, having water stored in bathtubs or other containers, and having blankets or other firefighting cloths ready for wetting and use. 2. Utility tie-off. a. Any water lines broken or leaking should be shut off to prevent loss of water. b. The tieing-off of damaged utilities such as gas and electricity should be attempted only by qualified personnel unless it is quite obvious that a given valve will shut off the flow of gas to a broken pipe and only to that pipe. 3. Fuel removal. Where fires cannot be controlled much might be accomplished by removing fuels in the path of the fire to prevent its spreading to other buildings especially the shelter building.
	G. Post-fallout. After the arrival of fallout all missions outside the shelter would be governed by the radiation levels. Only high priority missions would be attempted. 1. Dosimeters and personal records. 2. Decontamination.
III. FUNDAMENTALS OF FIRE SUPPRESSION—45 minutes	
Section Introduction	A. This lesson covers the following items: 1. Importance of the subject matter. 2. Principles of extinguishment. 3. Classification of fires. 4. Precautions.
Importance of Subject Matter	B. To prepare the student for the actual use of extinguisher equipment on fires he needs to know whether particular fuels are best controlled by cooling, smothering or fuel removal. C. There are hazards involved in the extinguishment of even small fires and the student needs to be aware of these.

MAIN TOPIC	TEACHING POINTS
Principles of Extinguishment (demonstrate)	D. Cooling. 1. Absorption of heat of fire. 2. Cooling of fuel below flashpoint. 3. Wetting of fuel to delay absorption of heat by the fuel.
	E. Fuel removal. 1. Shutting off of fuels carried in piping. 2. Removal of rubbish or other fuels in path of fire. 3. Covering fuels in path of fire with dirt or sand. 4. Building fire lines to control brush or grass fires.
(demonstrate)	F. Oxygen control. 1. Lids on flammable liquids. 2. Using an inert gas. 3. Covering with dirt or sand. 4. Closing doors.
Classification of Fires	G. Class A Fires. 1. Fuels that leave glowing coals. 2. Usually extinguished best by cooling.
	H. Class B Fires. 1. No glowing coals. 2. Usually extinguished by smothering.
(use chalkboard)	I. Class C Fires. 1. Electrical—fires where voltages are high enough to be dangerous. 2. Extinguishing agent must be non-conductor. 3. Current should be shut off if possible before extinguishment is attempted.
	J. Class D Fires. 1. Combustible metals—Magnesium, sodium, etc. 2. Require special handling. 3. Used in incendiary bombs.
Precautions	K. Items that may cause injury to individuals attempting fire extinguishment. 1. Fumes from burning materials. 2. Heated air. 3. Suffocation. 4. Falling debris. 5. Structural weaknesses. 6. Keep exit clear. 7. Radiological fallout.
Session Reviews— 10 minutes	A. Fire behavior.

MAIN TOPIC	TEACHING POINTS
	B. Fire prevention. C. Fire suppression. D. Precautions. E. Announce next class session.

LESSON PLAN NO. 3

COURSE TITLE AND NUMBER: Firefighting for Civil Defense Emergency—Part A

Section I—Portable Extinguishers
Section II—Use of Portable Extinguishers
Section III—Miscellaneous Equipment
Section IV—Evacuation—Rescue—First Aid

TIME: 3 hours

OBJECTIVES:

To give the student some performance capability in the use of portable extinguishers, equipment, and other useful tools in combating small fires. To give the student an appreciation of how they can judge the relative effectiveness of the extinguisher from the listing stamped on the extinguisher.

To give the student an understanding of some of the precautions necessary in fighting fires in structures and an appreciation of rescue technniques.

INSTRUCTIONAL AIDS:

Chalk board, chalk, and eraser.
Overhead opaque or slide projector.
Selected visuals.
Several types of portable extinguishers as available.
Location where small fires can be started and portable extinguishers demonstrated.

SELECTED REFERENCES:

a. Instructor's:
NFPA Pamphlets 10 and 10A.
Local and State Fire Training Manuals as available.
First Aid and Rescue Training Manuals as available.

b. Student's:
Manual—*Firefighting for Civil Defense Emergency—Part A*

SUGGESTED FILM:
"Portable Fire Extinguishers"—Fire Service Extenison—Iowa State University

MAIN TOPIC	TEACHING POINTS
I. SESSION INTRODUCTION—20 minutes	A. Review of previous lesson Instructor's Note: Hold class discussion to review previous class session. The following questions may be used to stimulate the discussion. 1. What are the major elements in most common fuels?

MAIN TOPIC	TEACHING POINTS
	2. What are the most common products of combustion? 3. What is heat and how is it measured? 4. Can a fire burn without oxygen? 5. How does heat travel? 6. What is one of the best ways of reducing fire losses? 7. Who should shut off utilities such as gas and electricity? 8. What are three methods of fire control? 9. What are some of the precautions in firefighting?
	B. This Session deals with elementary firefighting techniques. 1. Portable extinguishers. 2. Miscellaneous equipment. 3. Evacuation, rescue, and first aid. *INSTRUCTOR'S NOTE: If sufficient extinguishers and a location for using them are available for demonstration or practice there may not be enough time to complete the material for this session. If so, part of session four (4) should be devoted to the remainder of the material in this lesson plan.*
I. PORTABLE EXTINGUISHERS—40 minutes	
Section Introduction	A. This lesson deals with the following topics: 1. Importance of subject matter. 2. Extinguishing agents. 3. Means of expulsion. 4. Relative effectiveness of extinguishers and agents.
Importance of Subject Matter	B. The student has been given the fundamentals of fire behavior, the classifications of fires, and the methods of fire extinguishment such as cooling or smothering. Portable extinguishers employ various extinguishing agents for different classes of fire and various means are used to expel the extinguishing agent. It is important that the student understands these agents and how they are utilized.
	C. Portable extinguishers vary in their fire control potential. It is important that the Support Assistants be able to judge how much fire a given extinguisher will control.
Extinguisher Agents	D. Water base agents. 1. Water a. Cooling capacity. b. Economy and availability. c. Used with additives. 2. Loaded stream. a. Water base. b. Anti-freeze. c. Some Class B capability.

MAIN TOPIC	TEACHING POINTS
	d. Some fire retardent effect. 3. Wet water. a. Penetrating ability (Limits run off). b. High percentages of wetting agent will produce foam for Class B effectiveness. 4. Chemical foam. a. Water base. b. For Class B fires. c. Class A surface fires. 5. All water base agents are good conductors of electricity. E. Powder extinguishing agents. 1. Regular dry chemical. a. High Class B ratings. b. Some Class A "knock down" ability. c. Limited fire retardent (Class A). d. Non-conductor. 2. Multi-purpose dry chemical. a. Effective on Class A-B-C. b. Strong fire retardent effect on Class A. c. Non-conductor. 3. Special purpose dry powders. a. For Class D fires. b. Effective for combustible metals as specified on the individual extinguisher. c. Usually not effective on other classes of fire. F. Inert gas, smothering agents. 1. Carbon Dioxide CO_2. a. Leaves no residue. b. Non toxic (can be used on food). c. Snow very cold —110° F. but very limited heat absorption capacity. d. Effectiveness limited by strong air currents. e. Non conductor. f. Class B and C. 2. Vaporizing liquids. a. Safe only for specially engineered systems. b. Health hazard. *1.* of vapor. *2.* of decomposition products.
Means of Expulsion	G. Four methods are used to expel extinguishing agents. Extinguishers using a particular method have characteristics that make them visually identifiable and the means of putting the extinguishers into operation are characteristic of that method of explusion regardless of the agent used. *1.* Chemical. *2.* Stored pressure.

MAIN TOPIC	TEACHING POINTS
	3. Cartridge operated. 4. Hand pump.
(use illustration 6 or model)	*NOTE TO INSTRUCTOR: Have available models, cutaways or sketches of the various extinguishers so that the parts can be demonstrated.*
	H. Chemical action. 1. Soda acid. a. Sulphuric acid and baking soda solution are mixed when extinguisher is inverted. b. Chemical action generates pressure. 2. Chemical foam. a. Aluminum sulfate and baking soda are mixed when extinguisher is inverted. b. Chemical action generates pressure. 3. Characteristics. a. Ring top. b. No shut off.
(demonstrate)	c. Invert to put in operation (Demonstrate proper method of removing from wall, carrying, inverting and putting into operation.
(use illustration 6 or model)	I. Stored pressure—With this method the entire extinguisher is under pressure. They may be pressurized with air, nitrogen, or CO_2. 1. Types. a. Water. b. Dry chemicals and powders. c. Carbon dioxide (CO_2). 2. Characteristics. a. Guage, with the exception of CO_2 which is characterized by the large discharge horn. b. Carrying handle and squeeze lever at top of unit.
(demonstrate)	3. Method of operation. a. Pull lock pin. b. Point nozzle. c. Squeeze handle.
	J. Cartridge operated—With this method a small sealed cartridge usually filled with CO_2 provides the pressure for expulsion.
(use illustration 6 or model)	1. Types. a. Water. b. Dry chemical. 2. Characteristics. a. Pointed projection at top of extinguisher or operating lever to pierced cartridge. b. No gauge. c. With dry chemical types valve on end of hose. 3. Method of operation. a. Water types.
(demonstrate)	Remove seal, grasp hose, invert and bump.

MAIN TOPIC	TEACHING POINTS
	b. Dry chemical. Remove seal, invert and bump, squeeze hose valve. c. Alternate dry chemical. Remove seal, pump operating lever, squeeze hose valve.
(use model)	K. Hand pump. 1. Sizes. 2. Advantages. a. Can be refilled in use. b. Length of hose.
Numerical Ratings	L. Underwriters listings. 1. For class of fire. 2. Numeral for relative effectiveness. 3. No numerals for C and D agents.
III. USE OF PORTABLE EXTINGUISHER—Time—(optional) (45 minutes suggested)	
	A. If facilities are available the group should be taken outside where the extinguishers can be demonstrated on actual fires. When possible let some of the students operate the extinguishers but they need not develop skill in handling them. The development of skill in handling extinguishers is one of the aims of the "Safe" B course. The instructor may wish to delay the outside demonstrations until he has discussed the next section of this lesson "Miscellaneous Equipment." This would set the stage for demonstrating the use of sand, dirt, etc. on certain types of fires.
	B. In the outside demonstrations: 1. Redemonstrate proper methods of carrying and putting into operation. 2. Stress: a. Calm deliberate operations. b. Proper direction of extinguisher agent. c. Conservation of extinguishing agent. d. Careful overhaul of fires.
III. MISCELLANEOUS EQUIPMENT—15 minutes	
Section Introduction	A. This section will cover: 1. Importance of subject matter. 2. Auxiliary methods of fire control. 3. Miscellaneous equipment.

MAIN TOPIC	TEACHING POINTS
Importance of Subject Matter	B. Following a nuclear attack many small fires might need to be controlled. The Support Assistants may not have portable extinguishers or other regular firefighting equipment to do the job. He may have to do the best he can with what he has at hand.
Auxiliary Methods	C. Standpipes. Some buildings are equipped with standpipes and hose racks. If these are operational they can be effective in fire control. 1. Use valve to control pressure on line. 2. Straight stream from Class A, Fog for Class B.
	D. Garden hose. If water pressure is available lengths of garden hose can be coupled together to provide a small fire stream, some distance from the source. 1. Solid stream or spray. 2. Adapters for coupling to various types of faucets. 3. Section of hose cut off and slipped over faucet.
	E. Buckets of other containers. If water is available almost any type of container can be utilized to move water short distances. 1. Organize individuals to move water. 2. Water applied to fire only by specified individuals who know what they are trying to do.
	F. Sand and dirt. If immediately available in sufficient quantity, sand or dirt can be effective on almost any type of fire. 1. Organize individuals to dig or move dirt. 2. Direct the placement of the sand or dirt.
	G. Trash, grass and brush fires. This type of fire can often be controlled by fuel removal, building a fire line ahead of the fire or beating back the fire along the edge. 1. Tools for building a fire line. a. Shovels. b. Rakes. c. Hose. d. Heavy brooms, etc. 2. Tools for beating back fire and fuel along the edge. a. Wet sacks. b. Rugs. c. Heavy coats. d. Scoops. e. Heavy brooms, etc.
Miscellaneous Equipment	H. In addition to equipment or material for the actual combating of a fire there are many pieces of equipment that may be needed to get to a fire. 1. Ladders.

MAIN TOPIC	TEACHING POINTS
	INSTRUCTOR'S NOTE: Brief discussion on care in using ladders. This will be considered in more detail in the B course. 2. Cutting or opening tools. a. Axe. b. Bars. c. Picks. d. Spades, etc. (Brief discussion)
IV. EVACUATION, RESCUE, FIRST AID—35 minutes	
Section Introduction	A. This lesson will deal with: 1. Importance of subject matter. 2. Evacuation. 3. Rescue. 4. First aid.
Importance of Subject Matter	B. When fire control efforts fail or a building is entered for rescue purposes individuals may find themselves trapped. Knowing what to do and keeping a level head in these situations is vital to the fire fighter.
Evacuation	D. The need for calm deliberate actions should be stressed in fire situations. This is especially important when individuals are lost or trapped in a fire building. There are several points an individual should keep in mind and practice. 1. Keep your head. 2. Keep low. a. Best air. b. Visibility. c. Lowest heat. 3. Move cautiously. 4. Follow wall or other guide lines. 5. Feel doors before opening. 6. Watch for fresh air pockets. 7. Control breathing. 8. Cover nose and mouth. 9. Wet down clothing.
(demonstrate)	
(demonstrate how square knot might fold over and slip out—as used in first aid.)	D. Window escape. 1. Improvised rope. a. Type of knot (use becket bend not square knot). b. Anchor. 2. Window drop. a. Hand down as far as possible. b. Look for landing spot. c. Push away from building.

MAIN TOPIC	TEACHING POINTS
(demonstrate selected drags and carries)	E. Rescue. 1. Care in getting information. a. Individuals who were in the building. b. Not outsiders. 2. Plan the search. 3. Work in pairs. 4. Leave someone outside. 5. Have a guide line. a. Rope. b. Hose. 6. Search corners and under beds. 7. Stop and listen. 8. Call to victims so that can crawl toward your voice. 9. Walking assists—drags. F. First Aid. 1. Bleeding. a. Importance. b. How to control. 2. Breathing difficulties. a. Position. b. Respiration. c. Carbon monoxide. 3. Fractures. a. Types. b. Move only when necessary. 4. Burns. a. Degree. b. Dressing. c. Treatment. 5. Shock. a. Dangers. b. Symptoms. c. Treatment.
Session Summary—10 minutes	A. Portable extinguishers. 1. Characteristics. 2. Methods of using. B. Miscellaneous equipment. 1. What. 2. Where. C. Evacuation and rescue. 1. Precautions. 2. Search. 3. First aid. D. Announce next class session.

LESSON PLAN NO. 4

COURSE TITLE AND NUMBER: Firefighting for Civil Defense Emergency—Part A

Section I—Shelter Fire Guard Organization and Function
Section II—Shelter Fire Guard Operations
Section III—Course Summary

TIME: 3 hours

OBJECTIVES:

To give the student an understanding of shelter organization and the function and responsibility of the fire guards. To enable the student to perform the duties of a shelter fire guard in a nuclear emergency.

INSTRUCTIONAL AIDS:

Chalkboard
Slide projector
Selected charts and visuals

SELECTED REFERENCES:

a. Instructor's:
Listing of licensed shelters in the area
Shelter manuals
Local Civil Defense Shelter plans
Local utility company directives

b. Student's:
Manual—*Firefighting for Civil Defense Emergency—Part A*

FILMS:
Safety Measures in Public Shelters

MAIN TOPIC	TEACHING POINTS
SESSION INTRODUCTION—25 minutes	A. Complete lesson 3 (if applicable). B. Review of previous session. Instructors note: (Hold class discussion to review previous class session. The following questions may be used to stimulate the discussion.) 1. Why is water an effective extinguishing agent?

MAIN TOPIC	TEACHING POINTS
	2. What is an inert gas? 3. What is the primary characteristic of an extinguishing agent for Class C fires? 4. What is one of the main advantages of carbon dioxide? 5. What four methods are used to expel extinguishing agents in portable extinguishers? 6. What other equipment besides portable extinguishers are helpful in combating fire? 7. What is probably the one most important thing an individual can do when trapped in a building by fire? 8. Can information from persons on a fire scene always be relied in regard to trapped persons ?
	C. This session deals with the following topics: 1. Shelter fire guard organizations and functions. 2. Shelter fire guard operations. 3. Shelter emergence and course summary.
I. SHELTER FIRE GUARD ORGANIZATION AND FUNCTIONS— 40 minutes	
Importance of the Subject Matter	A. This lesson deals with the following topics: 1. Importance of subject matter. 2. Fire guard functions. 3. Fire guard selection. 4. Fire guard organization.
	B. In the event of a nuclear attack and the movement of people into shelter the fire guard function will be of utmost importance for the safety of the shelter occupants. The stress of shelter living will introduce fire hazards added to the threat of nuclear caused fires from outside the shelter. The loss of the lives of many of the people due to radiation exposure. The fire guards must be sufficiently knowledgeable and trained to go about their jobs in a calm business-like manner. Any disorganized operations could cause unrest or anxiety among the shelter occupants.
Fire Guard Functions	C. Instill confidence. Many of the shelter occupants will be aware of the fire threat. A well-organized, well-functioning fire guard will do much to calm the occupants and ease the stress of shelter living.
	D. Fire prevention. 1. Inspection of the shelter area previous to attack. 2. Inspection of the area adjacent to but outside the shelter area. a. In the shelter building.

MAIN TOPIC	TEACHING POINTS
	b. Outside the shelter building. 3. Regular patrol of shelter and adjacent areas to spot incipient fires. E. Fire control. 1. Suppression of incipient fires within the shelter. 2. Suppression of fires external to the shelter which threaten shelter security. F. Sources qualifications. 1. Professional fire fighters. a. Will be limited in numbers. b. May need to limit their radiation exposure for extreme emergencies. 2. Previous fire training. a. Retired fire fighters. b. Military fire training. c. Industrial fire brigade training. d. Others. 3. Support Assistants for Fire Emergencies. 4. Physical capability. G. Number of fire guards. 1. Minimum organization. a. Shelter fire guard leader. b. One fire guard team (2 guards per team). 2. Criterial for additional guards. a. Size of shelter. b. Number of extinguishers. c. Number of occupants. d. Area of shelter. e. Area to be patrolled.
Fire Guard Organization	H. Shelter fire guards will be required for all public fallout shelters planned for use. Where a CSP project has been completed, the fire defense planner should secure from the civil defense director, or the CSP project director, a copy of the CSP Facility List/Accounting Form (OCD Form 756). This form shows the number of people allocated to each public shelter facility, and may be used for estimating shelter fire guard requirements in individual public shelters. The criteria below are recommended as a starting point for establishing local requirements for shelter fire guards. Note that shelter fire guards—to direct the fire defense of each public shelter—should be oriented or trained *during crisis periods*. Fire guard *team members* would be secured from among shelter occupants, after population movement to shelter.

MAIN TOPIC	TEACHING POINTS

Shelter capacity (persons)	Shelter fire guards (leaders required)
Up to 100	2
100— 300	3
300— 800	4
800—1,500	5
1,500—5,000	7
Over 5,000	10, plus 10 for every additional 5,000 persons.

Actual requirements should, if possible, be based on analysis of each public shelter facility involved. Factors which would indicate higher requirements for shelter fire guards than those above would include type of building construction, and location of the building in a block with relatively high fire-risk. For example, where it is necessary to use public shelter space in a building having relatively high fire-risk, it would be advisable to increase the number of shelter fire guards by 50 percent over the number recommended in the table previously.

II. SHELTER FIRE GUARD OPERATIONS—
Time 60 minutes

Section Introduction

A. This lesson includes.
1. Importance of subject matter.
2. Preattack shelter preparations.
3. Postattack operations.

Importance of Subject Matter

B. The fire guard would have many things to do in the pre-attack interval and very little time. Their pre-attack functions could prove vital to the survival of the shelter occupants. If they are to perform these functions in a minimum of time, they must understand these functions and there will be little time for study after an attack warning. Stress critical importance of shielding windows by keeping window blinds and shades closed, or by painting, coating, or otherwise covering the windows—removing curtains, and removing ignitable furniture from window areas upon occupying public shelters—to minimize ignitions within shelters.
Shutdown of utilities in accordance with shelter plan and instructions, and local regulations.

Preattack Shelter Fire Prevention

C. Discipline:
Shelter police would have the responsibility for in-shelter discipline with the possible exception of fire prevention regulations. These would be established by the fire guard and possibly enforced by them. Regulations would need to cover:
1. Smoking.
   a. Depends on shelter area and ventilation.
   b. Might be restricted to certain areas.

MAIN TOPIC	TEACHING POINTS
	2. Rubbish disposal. 3 Cooking and heating fires. a. No charcoal fires. b. Shelter air supply may exclude use of fire for heating or cooking. D. Fire equipment location. 1. Collect and assemble fire extinguishers in the shelter as practical. Do not remove extinguishers from other portions of the building where their need might be critical. 2. Locate standpipe connections and hoses. 3. Locate automatic fire systems controls. a. Determine if building has a reserve water tank for sprinkler system. b. Determine if alarm system has battery stand-by. E. Shelter building inspection. 1. Remove kindling fuels from exposure to nuclear heat radiation. 2. Shield personnel or move them to areas not exposed to the heat of the "fireball." F. Utilities shutoff. This should be done in accord with local utility regulations and only by qualified people. 1. Water. 2. Electricity. 3. Gas. (See Shelter Manual or "Safe" A test.) G. Manufacturing processes. All processes that might contribute to the danger of fire in the shelter building should be shut down.
Postattack Operations	H. Immediate postattack operations would be most critical where the area had been exposed to the heat of a nuclear burst. It would be of utmost importance to catch any fires while they were small and the time period before the arrival of fallout could be as little as 30 minutes. First priorities would be: 1. Extinguish ignitions in the first 5 to 10 minutes after burst, to protect the shelter building. 2. Seal shelter from smoke and fumes. 3. Public shelters that were threatened by uncontrollable fires would have to be evacuated immediately. Shelter fire guards would assist in the prompt relocation of the threatened population to the best fallout protection available in fire-safe areas. I. Inspection of shelter building and adjacent structures. 1. Coordinate with radiation monitor. 2. Suppress selected fires. 3. Examine utility damage.

MAIN TOPIC	TEACHING POINTS
	J. Fire patrol. 1. Determine patrol route. a. Minimize radiation exposure. b. Classify areas according to fire hazard potential. c. Limit length of route. 2. Assign personnel. a. Adequate rest periods. b. Monitor individual's radiation exposure.
	K. Restore utilities. Contingent upon damage and local utility company regulations.
Shelter Emergence	L. Emergence from the shelter for specific missions will depend on several factors. 1. The importance of the mission. a. To perform rescue. b. To extinguish selected fires. c. To obtain vital supplies. d. To obtain vital reconnaissance information. e. Transfer of needed personnel, equipment, or supplies to other shelters. 2. Radiation levels. a. Present. b. Forecast. 3. Personnel available. a. Qualifications for the mission. b. Present radiation doses of qualified individuals.
	M. Emergence for damage assessment. 1. Damage determination. a. From blast. b. Number of fires in vicinity. c. Radiation levels. 2. Help requirements. a. Rescue. b. Firefighting. c. Decontamination.
III. COURSE SUMMARY— 45 minutes	*(INSTRUCTOR'S NOTE: Review the entire course by having a group discussion. The following list of questions is suggested as a means of stimulating discussion and at the same time keeping the discussion relevant.)* A. Civil Defense. 1. What is civil defense? 2. Who is civil defense? 3. Who is responsible for civil defense? 4. Why is the shelter system important?

MAIN TOPIC	TEACHING POINTS
	B. The nuclear fire threat. 1. What is the scope of the nuclear fire threat? 2. Can the existing fire services cope with the nuclear fire threat? 3. What role might the Support Assistants play in a major fire emergency? 4. Has this course qualified Support Assistants to play a leading role in a major fire emergency? 5. Why is discipline necessary in the fire services? C. Fire control. 1. Would there be enough firefighting equipment to cope with nuclear fires? 2. How can the average citizen help to reduce the number of fires in the event of a nuclear attack? 3. What fires would have the highest priority if all could not be controlled? 4. What kinds of situations might justify exposing fire personnel to nuclear radiation approaching dangerous doses? 5. What part may the Support Assistant play in shelter fire protection? D. Course conclusion. 1. Review specific role of Support Assistants in local area. 2. Encourage students to continue in Support Assistant B Course. 3. Award Support Assistant A cards. *(INSTRUCTOR'S NOTE: Have CD or government official present if possible to award the card.)*