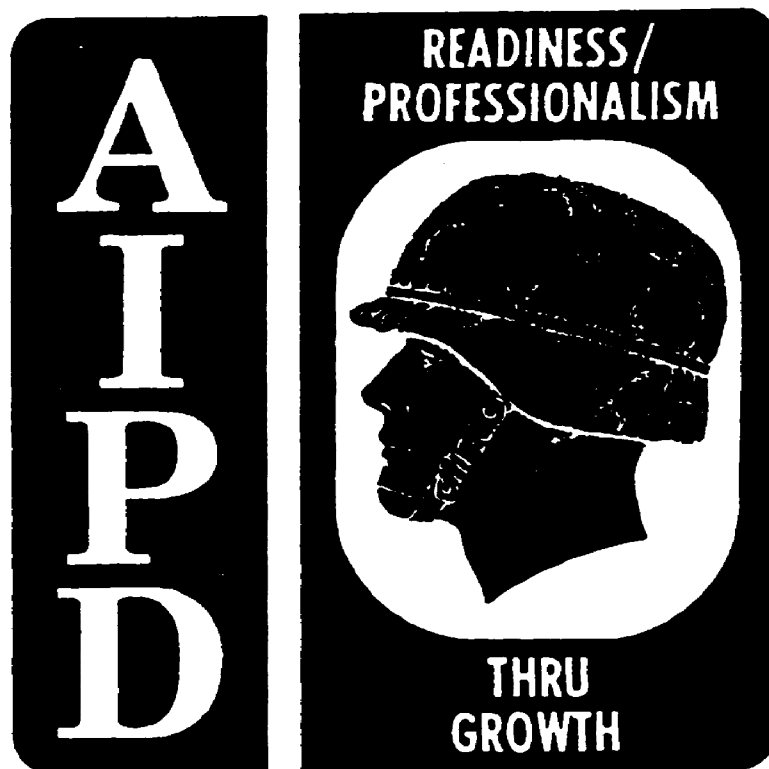


SUBCOURSE
QM5127

EDITION
5

MANAGE A PETROLEUM
LABORATORY SAFETY PROGRAM
(101-523-2253)



THE ARMY INSTITUTE FOR PROFESSIONAL DEVELOPMENT
ARMY CORRESPONDENCE COURSE PROGRAM

**MANAGE A PETROLEUM LABORATORY SAFETY PROGRAM
(101-523-2253)**

**SUBCOURSE QM 5127
Edition 5**

**United States Army Combined Arms Support Command
Fort Lee, VA 23801-1809**

Two Credit Hours

GENERAL

The Manage a Petroleum Laboratory Safety Program subcourse is part of the Petroleum Laboratory Specialist MOS 92C Skill Level 2 Course. It is designed to teach the knowledge necessary for managing, monitoring, or implementing a laboratory safety program. This subcourse is presented in one lesson corresponding to the terminal learning objective as indicated below.

Lesson 1: MANAGE A PETROLEUM LABORATORY SAFETY PROGRAM

TASK: Manage a Petroleum Laboratory Safety Program.

CONDITIONS: You have just been assigned the duty of the laboratory safety noncommissioned officer (NCO). You must inspect the laboratory and train all laboratory personnel in safety procedures. In addition, you must establish new procedures as required.

STANDARDS: Demonstrate competency of the tasks skills and knowledge by correctly responding to the multiple-choice test covering management of a petroleum laboratory safety program.

(This objective supports SM Task 101-523-2253, Manage a Petroleum Laboratory Safety Program.)

When used in this publication, "he," "him," "his," and "men" represent both the masculine and feminine genders unless otherwise stated.

Passing score for ACCP material is 70%.

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INTRODUCTION TO MANAGE A PETROLEUM LABORATORY SAFETY PROGRAM

All laboratories are subject to inspections from regulatory agencies. Agencies that inspect laboratories include health officials from the city, state, or federal governments. In addition, representatives from Occupational Safety and Health Administration (OSHA), Environmental Protection Agency (EPA), Post Safety Office, Fire Department, or facility engineers may also be expected.

Depending on your laboratory's location (continental United States (CONUS) or outside the continental United States (OCONUS)), size (base laboratory, mobile laboratory, or air mobile laboratory), or previous accidents reported, you may receive a visit from any one or all previously mentioned agencies.

These agencies will check different aspects of the laboratory safety program. All inspectors will be interested in your quarterly accident reports. This report will pinpoint problem areas. Learning events 1 through 3 will give you an idea of the major items inspectors look for.

LESSON 1

MANAGE A PETROLEUM LABORATORY SAFETY PROGRAM

TASK

Manage a Petroleum Laboratory Safety Program.

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STANDARDS: Demonstrate competency of the tasks skills and knowledge by correctly responding to the multiple-choice test covering management of a petroleum laboratory safety program.

REFERENCES

SM 10-92C, Soldier's Manual: 92C, Petroleum Laboratory Specialist (Skill Levels 1, 2, 3, and 4)

FM 10-70, Inspecting and Testing Petroleum Products

FM 10-72, Petroleum Testing Facilities: Laboratories and Kits

Learning Event 1:

INSPECT THE LABORATORY TO IDENTIFY EXISTING AND PROBABLE SAFETY DEFICIENCIES

This aspect of the 92C soldier's responsibility is usually gained through experience. The use of existing field manuals (FMs), technical manuals (TMs), unit fire and safety manual, previous inspection reports, or a visit to another laboratory will help to familiarize soldiers who lack experience. The safety program for laboratories is standard, even though the size and types of laboratories differ. Both civilian and military safety officers will look at safety signs, safety equipment, protective equipment, and the storage of samples and chemicals. The fire safety program, even though it is part of the safety program, is not discussed in this lesson.

Safety Signs

All hazards must be identified whether they are visible or hidden, and appropriate safety signs must be posted wherever applicable in conspicuous locations. Examples of common required signs in the laboratory are:

Lesson 1/Learning Event 2

- Exit.
- No smoking.
- Eye protection must be worn.
- Hearing protection must be worn.
- First aid station.
- Eye wash station.
- Safety shower.
- Fire extinguisher.

Safety Equipment

The severity of an accident can be minimized if safety equipment is used. It must be checked for serviceability on a routine basis. Examples of common required safety equipment are:

- eye wash.
- shower.
- fire extinguisher.
- fire blanket.
- safety shield.
- fume hood.
- first aid kit.

Protective Equipment

Protective equipment was not designed to enhance the appearance of the soldier. It is only effective when used. The wearing of protective equipment is mandatory. Examples of common required protective equipment are:

- lab coat.
- lab apron.
- gloves.

- asbestos (protection against heat).
- rubber (protection against acids).
- disposable (protection against chemicals).
- eye protection.
 - safety glasses.
 - safety goggles.
 - approved face mask.
- ear protection.
- safety shoes.

Storage of Samples and Chemicals

-Samples:

--Cleanliness, caution, and common sense must be exercised when storing or handling petroleum products. Five gallons of gasoline or its equivalent is equal to 415 pounds of dynamite.

--The storage area must be kept clean at all times. It is potentially the most dangerous area in the laboratory.

--The discarding of used samples is governed by local standing operating procedures (SOPs) and the laboratory's mission and storage space. Generally, samples are retained for 30 days. Special samples are retained for 6 months.

-Chemicals:

--Chemicals including solvents, must be stored correctly.

--Store chemicals in areas consistent with their properties.

---Store volatile materials in well-ventilated areas.

---Store chemicals away from other chemicals with which they will react violently. Examples of this in the petroleum laboratory are strong acids which react with strong bases and oxidizing agents which react with reducing agents.

Lesson 1/Learning Event 1

Poisonous Materials

All poisonous materials must be clearly marked POISON. Report to your supervisor any poisonous material that is not needed.

Storage Area Inspection

Check for the following when inspecting the storage area:

- Any unusual odor must be investigated.
- Aisles must be clean and uncluttered.
- Aisles must be 3 feet wide.
- Shelves must be clean and uncluttered.
- Step stool or ladder must be serviceable.
- Containers must be tightly capped.
- Containers must be labeled.
- Damaged containers must be discarded.
- All spills must be wiped up.
- Sufficient amounts of cleanup material must be on hand.
- Cylinders must be secured.
- Storage area must be ventilated.
- Storage area must have adequate lighting.
- Fire extinguishers must be on hand.
- Appropriate safety signs must be displayed.
- No items are stored on wood pallets.
- Heavy and bulky chemicals are stored on or near the floor.

Learning Event 2:

ESTABLISH PROCEDURES TO DEAL WITH SAFETY HAZARDS AND STORAGE OF HAZARDOUS CHEMICALS IN THE LABORATORY

The following steps are involved in establishing a new procedure:

- Identify the problem or potential problem.
- Evaluate the problem.
- Initiate action.
- Present it to the fire/safety committee.
- Incorporate into the fire/safety manual.

Examples are:

-Identify the problem. You observe a technician turning on the compressors; however, he is not wearing ear protection.

-Evaluate the problem. Ask the technician why he isn't wearing ear protection.

-Initiate action.

--If the soldier was unaware of the requirement - advise him that it is a requirement.

--If the soldier forgot to wear the ear protection - counsel the soldier.

--If the ear protection was missing or unserviceable - replace (borrow one for the interim period and have supply order two pair).

-Present it on the agenda at the next quarterly fire/safety committee meeting for adoption.

-Incorporate into the fire/safety manual

If the identified problem is a new situation, take immediate corrective action. Then present it to the fire/safety committee.

Lesson 1/Learning Event 3

Learning Event 3:

TRAIN PERSONNEL IN ACCIDENT PREVENTION PROCEDURES.

During the initial interview on the soldier's first day, he should be made aware of safety. This is usually done by the noncommissioned officer in charge (NCOIC). This concern must be shared by every soldier in the laboratory. As the safety NCO, your job is to reinforce safety consciousness.

Every quarter you will be tasked to give a safety class. Discussions rather than lectures are more beneficial because they require all technicians to take part.

The discussion should include a review of laboratory accidents. This review heightens awareness because it is current and close to home. It reinforces because it may point out something that you take for granted or never thought about.

The discussion should answer the following questions:

- How did the accident occur?
- Why did it occur?
- How could it have been prevented?

The following is provided as an example:

During the past quarter, Private Jones had to go to the emergency room as a result of acid burns to his fingers. The injury could have been worse had it not been for the immediate action taken by another technician.

On the day in question, Private Jones was performing two tetraethyllead (TEL) tests. He stated that halfway through his tests, his fingers started to itch and then started to burn. Specialist Smith had Private Jones put his hand under the faucet and ran water on his hand for ten minutes. He later transported the Private to the emergency room.

- How did the accident occur?

The accident occurred when Private Jones was performing the evaporation phase of the test. He removed the watch glass with his fingers rather than using the tongs.

-Why did the accident occur?

The acid that burned Private Jones' fingers was present on the watch glass. Nitric acid had evaporated and then condensed on the watch glass. He should have removed the watch glass with a pair of tongs.

-How could it have been prevented?

Carelessness due to ignorance, indifference, or slovenly attitudes all have the same result - possible injury to the soldier.

--Ignorance. The technician should have been aware of the chemical reaction taking place. Although the soldier had been school-trained, he failed to use proper laboratory techniques. He also violated another cardinal rule--never attempt to perform more tests than you can handle efficiently and safely.

--Indifference. The senior technician assigned to supervise him was not present. While the senior technician is not required to be with the junior technician at all times, he should have been in the general vicinity.

--Slovenly attitude. Too often in the laboratory, soldiers become lackadaisical due to routine. Until a new technician gains experience he could be accident prone.

Lesson 1/Practice Exercise

PRACTICE EXERCISE FOR LESSON 1

Instructions:

You have just finished reading the instructional material for Lesson 1. This lesson covered management of a petroleum laboratory safety program. It is now time to check your understanding of this lesson. This is done by completing the practice exercise below. All of the questions are multiple-choice and are intended to measure your understanding of the procedures used in performing the task. There is only one correct answer to each question. Try to answer all of the questions without referring to the lesson materials.

When you have completed all questions, turn the page and check your answers against the correct responses. Each correct response is referenced to specific portions of the lesson material so that you can review any questions you have missed or do not understand. When you have completed this practice exercise, you should review all of the subcourse material before starting the posttest.

1. Where do technicians usually learn the job of a safety NCO?
 - a. Army schools.
 - b. Civilian schools.
 - c. Correspondence courses.
 - d. Experience.

2. When should safety equipment be checked?
 - a. Prior to inspections.
 - b. When directed by the NCOIC.
 - c. On a routine basis.
 - d. Only after use.

3. Where do you find the plan governing used samples?
 - a. Environmental Protection Agency.
 - b. Occupational Safety and Health Administration.
 - c. Local Standing Operating Procedures.
 - d. Military Handbook 2000.

4. What types of gloves, if any, should be used when handling toxic chemicals?

- a. None.
- b. Asbestos.
- c. Rubber.
- d. Disposable.

5. What should you do immediately when you observe a potential safety problem?

- a. Notify your supervisor.
- b. Consult SOP.
- c. Take immediate action.
- d. Counsel the soldier.

Lesson 1/Practice Exercise Answers

Lesson 1/Practice Exercise Answers

ANSWER SHEET FOR PRACTICE EXERCISE

Lesson 1

1. d (Refer to Learning Event 1)
2. c (Refer to Learning Event 1)
3. c (Refer to Learning Event 1)
4. d (Refer to Learning Event 1)
5. c (Refer to Learning Event 2)