



# Pennsylvania State Fire Academy

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## Minimum Standard for Accreditation (MSA)

July 1992

**Course Title:** Pump Operations I - (PUOP)

**Length of Course:** 16 Hours

**Lecture/Lab Breakdown:** 10/6

**Prerequisites:** IST

**Referenced Texts:** IFSTA Fire Department Pumping Apparatus - 7th edition; IFSTA 106 Fire Apparatus Practices - 6th edition; Fire engineering "Fire Service Pump Operators Handbook", Warren E. Isman; NFPA 1002 Fire Service Driver/ Operator Professional Qualifications.

**Course Goal:** This course will introduce the student to basic concepts and methods of fire pump operations.

**Description of Course:** This course provides the fire fighter with an introduction to basic pump construction and theory as well as operating techniques. Emphasis is placed on getting water to the pump, getting water from the pump for hose streams, and prevention of common mistakes in pump operations.

**Description of Methodology to be used: (Brief)** A combination of lecture, discussion, demonstration, and supervised practice.

**Student Equipment/Supply Needs:** Pen/Pencil, Notebook suitable for classroom and field use. Fire fighter protective clothing.

**Equipment/Audiovisual/Supply requirements:** Classroom with adequate seating; chalkboard; screen; overhead or slide projector appropriate for A/V selected. Pumpers - minimum of two rated pumpers, preferably of a different manufacturer of pumps. Both single stage and two stage preferred. Draft site where pumpers may be operated safely, access to hydrants of adequate flows where pumper may be operated safely and water runoff does not pose a problem. Sufficient nozzles and appliances for discharge of pump capacity. Two portable master stream appliances. Where two or more apparatus are to be used simultaneously, one instructor for each pumper is required.

continued

**COURSE OUTLINE**

<b><u>Time</u></b>	<b><u>Content</u></b>
:30	Registration/Introduction/Safety
2:00	Pump Structure & Drive Systems
1:00	Pump Layout & Pump Ratings
1:30	Basic Flow & Pressure Calculations
1:30	Theory of Operation of Pressure Control Devices
1:00	Theory of Drafting/Priming Systems
2:00	Pump Operation from Draft (Practical)
1:00	Hose Line Flow Exercise - Single Line
1:00	Pumper Performance Testing (Practical)
1:30	Hydrant Systems/Theory/Testing/Procedures
2:00	Pumping From Hydrants (Practical)
1:00	Maintenance Procedures

Times are based on 20 students.

Competency Evaluation Mechanism: Instructor evaluation of student mastery of applicable skills.

Course Objectives (specific): Upon completion of this course the student shall demonstrate the following to the satisfaction of the instructor.

1. Successfully demonstrate the correct method of transferring power to the pump.
2. Successfully demonstrate the ability to pump capacity from draft.
3. Successfully demonstrate an annual performance test.
4. Produce safe and effective hand and master streams.
5. Successfully demonstrate the correct operation of the volume/pressure transfer valve.
6. Successfully demonstrate the correct operation of the pressure control device.
7. Demonstrate knowledge of nozzles, flows, pressures, and friction loss by correctly operating the pump in a variety of flow situations. (
8. Successfully demonstrate the ability to pump capacity from a hydrant.
9. Shall observe for and prevent or correct; cavitation; leaking fuel, oil, water; overheating; unusual noises; vibrations; water hammer.
10. Perform readiness checks necessary to determine the pumper is operational.