



Pennsylvania State Fire Academy

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Minimum Standard for Accreditation (MSA)

July 1992

Course Title: Pump Operations II (PUOA)

Length of Course: 16 Hours

8/8

Lecture/Lab Breakdown:

Prerequisites: IST; PUOP

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 advanced concepts and methods of fire pump operation.

Description of Course: This course is designed to instruct the student in advanced techniques of operating pumps. Topics covered include friction loss, relay pumping, master streams, elevated master streams.

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 or field use, Fire Fighters Turn Out Gear.

Equipment/Audiovisual/Supply requirements: Classroom with adequate seating, chalkboard, screen, overhead and/or slide projector as selected. PUMPERS: 3 rated pumpers 1000 GPM or over - 5" hose (3000 feet) 3" Hose (1000 feet) - aerial ladder or platform. 3 portable master stream devices - draft site suitable for large discharges. Hydrant site capable of high flows where runoff is not a problem. Where two or more pumpers will be used simultaneously, a second instructor is needed.

COURSE OUTLINE (General - Not Detailed)

<u>Time</u>	<u>Content</u>	<u>Instructor Notes</u>
:30	Registration and Introduction	
2:00	Pump Structure & Drive Systems - Review	
1:00	Principles of Hydrostatics and Hydrokinetics	

continued

MINIMUM STANDARDS FOR ACCREDITATION

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COURSE OUTLINE continued

<u>Time</u>	<u>Content</u>	<u>Instructor Notes</u>
1:00	Flow & Pressure Calculations by 'Q' method Multiple Lines	
2:00	Flow & Pressure Exercises; Wyed Lines; Siamesed Lines; Master Streams. (Practical)	
1:00	Relay Principles	
1:00	Inline Pumping Operations (Practical)	
3:00	Relay Pumping (Practical)	
2:00	Elevated Master Streams (Practical)	
1:30	Special Devices - Sprinklers, Standpipes, Eductors	
1:00	Pump Maintenance	

Times are based on 30 students.

Competency Evaluation Mechanism (Brief description-attach copy): Students will be evaluated during practical exercise.

Course Objectives (specific): Upon completion of the course the student shall do the following to the satisfaction of the instructors:

1. Demonstrate mastery of the objectives in Pump Operations I (PUOP)
2. Operate pumpers in such a manner to prevent or correct cavitation; leaking fuel, oil, water; overheating; unusual noises; vibrations; water hammer. (NFPA 1002 3-1.6)
3. Demonstrate knowledge of hydraulics by correctly calculating friction and elevation loss using algebraic formulae. (NFPA 1002 3-4.1, 3-4.4, 3-4.5, 3-4.6)
4. Successfully operate a pumper in a relay situation. (NFPA 1002 3-6.5d)
5. Successfully supply elevated master streams. (NFPA 1002 3-4.3 d, e, f, & i)
6. Participate in a lecture/discussion of the principles involved in supplying water to a sprinkler and a standpipe system. (1002 3-3.1 to 3-3.7)
7. Be familiar with the operation of and supply water to foam proportioners of the inline and by-pass types.
8. Re-service equipment used by performing checks outlined in (NFPA 1002 3-1.1).

**Questions/Comments: Rita Wessel, Curriculum Specialist: Extension 106
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