

# This Month's *Working Fire*...

©1999 - Spirit Sports

**Volume 99-3: March 1999**  
**Approx. Program Length 53:40**

## **FIRELINE**

### **Abandoned Apartment Complex Fire Fort Worth, TX**

**Approx. length: 6:56**

The weather was extremely foggy which forced responders to use extreme caution in transit to the incident. An accelerant was found on the premises of this abandoned apartment complex which was well involved when firefighters arrived. There were reports of transients possibly being in the building but Search and Rescue found no one. An aggressive interior attack was thwarted by the danger of a roof collapse which had burned through. The incident went defensive with exterior handlines and aerials. A good lesson learned from this fire is to occasionally preplan vacant buildings to be aware of conditions inside such as holes in floors, holes in walls which allow for quicker fire spread, etc. For more information, contact Lt. Marc Meroney, c/o Fort Worth Fire Department, 1000 Throckmorton, Fort Worth, TX 76102 or call him at 817-871-6801.

### **Pleasure Boat Marina Fire Sandusky, OH**

**Approx. length: 9:28**

Residents trying to thaw pipes apparently started this marina fire along Lake Erie. Due to old construction and poor building codes, the fire spread rapidly. Plowed snow along already narrow streets inhibited access to the fire as did gawking neighbors. Drafting was used to augment small-diameter hydrant lines but two feet of lake ice and a low water level made it difficult. In spite of these problems, the incident proceeded smoothly thanks to Incident Command which orchestrated a number of mutual aid departments as well. For more information, contact Assistant Chief Michael Meinzer, Sandusky Fire Department, 901 W. Market St., Sandusky, OH 44870 or call him at 419-627-5837.

## **HANDS-ON**

### **Engine Pump Recertification Part II**

**Approx. length: 9:31**

In Part 2 of this three-part series, Trainer Barry Ashman shows you the right way to recertify your pump and offers some great tips to make it easier. See relevant figures and formulas later in the "Hands-On" section of these Training Materials which correspond to the pump service capacity flow tests conducted in this segment. This series, extended for an additional segment, will conclude next month. For more information, contact Barry Ashman at Ashman Enterprise: 941-772-3129 or 941-336-E-ONE.

## This Month's "Working Fire"

### HANDS-ON (cont.)

#### **Forcible Entry Tips & Techniques Part III**

**Approx. length: 10:42**

In Part Three of a three-part series, Jacksonville firefighters demonstrate a number of techniques and tips that can be used for forcible entry. This month concentrates on popping door hinges using the irons and an air chisel, using the irons to open an inward-opening door, and the use of a "D'Ax" carbonite-toothed circular saw. For more information, contact Captain Rob Sorenson, Jacksonville Fire-Rescue Dept., 2700 Firefighter Memorial Drive, Jacksonville, FL 32246 or call him at 904-645-0124.

### FIRE MEDICS

#### **Carbon Monoxide Poisonings**

**Approx. length: 10:52**

A clogged chimney flu allowed carbon monoxide gas (CO) to accumulate which led to the deaths of an elderly couple and sent seventeen others to the hospital. The row houses where the incident occurred were over 140 years old and shared a common attic space which helped disburse the fumes. Firefighters and EMS personnel removed the ambulatory residents and harbored them in a "safe house" across the street. Subsequent search teams found the victims and EMS worked hard to revive them. An interesting, joint Fire/EMS Incident Command exercise which suggested a number of lessons to be learned. For more information, contact Lawrence Tan, Commander of EMS Operations, New Castle County Police Department, 3601 N. DuPont Highway, New Castle, DE 19720 or call him at 302-571-7493. Or contact Battalion Chief Al Huelsenbeck, Wilmington Fire Department, 300 N. Walnut St., Wilmington, DE 19801 or call him at 302-571-4410.

### EVOLUTIONS 2000

#### **Kramer vs. Kramer: Carbon Monoxide Detectors: Fire Department Responsibility?**

**Approx. length: 3:00**

*Working Fire* and Professor/Chief Bill Kramer presents our Continuing Education segment that's worth one credit from the University of Cincinnati. This month, Bill argues the issues of responsibility which carbon monoxide detectors pose for fire departments. For more information, contact the Open Learning Fire Service Program, College of Applied Science, 2220 Victory Parkway, ML #103, Cincinnati, Ohio 45206 or call 513-556-6583.

## **This Month's "Working Fire"**

### ***From the Departments Involved...***

#### **DISCUSSION QUESTIONS FOR THIS MONTH'S INCIDENTS**

The departments involved in this month's incidents pose some discussion questions that you can use as discussion-starters in your own department's training sessions. Let's kick it around!

#### ***Abandoned Apartment Complex Fire/Fort Worth, TX Lieutenant Marc Meroney, Fort Worth Fire Department, Fort Worth, TX***

1. Do you handle your response to an abandoned apartment or building complex the same way you would to structures that are populated?
2. Do you work with local police to patrol empty buildings such as apartment complexes which would very likely attract the homeless, thereby increasing the risk of a careless fire? Do you preplan them occasionally to see if their condition has changed?
3. Do you drive with care in foggy weather, cutting speed in spite of the need to respond as quickly as possible?

#### ***Pleasure Boat Marina Fire/Sandusky, OH Assistant Chief Michael Meinzer, Sandusky Fire Department, Sandusky, OH***

1. Is your department prepared for the hazards and hassles of cold-weather responses?
2. What kind of protocol does your department have for handling citizens at the fire scene? Does it include the police?
3. Are you prepared for possible water supply problems in certain areas of your jurisdiction by extensive preplanning? Has your department thought about lobbying for a change in infrastructure to improve such at-risk areas?

# Enhanced Training

## Engine Pump Recertification, Pt. II

### Objectives

After watching this program the student shall:

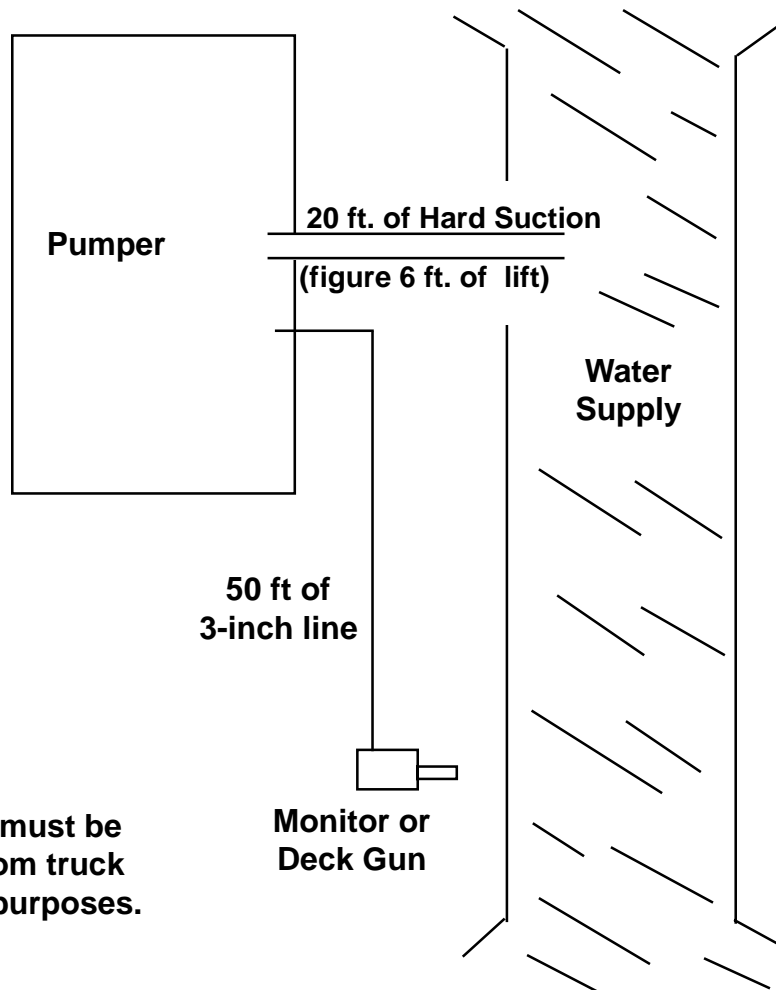
1. understand how to conduct 100% and 70% capacity flow tests
2. acquire helpful tips and instruction on the handling and maintenance of engine pumps.

### Standards and Regulations

This training is consistent with NFPA 1911, 7th edition, 1997; IFSTA, "Fire Department Pumping Apparatus," pgs. 217-229; and appropriate OSHA regulations and practices.

### Training Outline

#### A. APPARATUS TEST CONFIGURATION



**NOTE:** Deck guns must be removed from truck for testing purposes.

## Engine Pump Recertification, Pt. II

### A. BASIC EQUIPMENT NEEDED

1. Hard suction and strainer
2. Pitot tube
3. Pressure gauge, 0 – 300 psi and 0 – 200 psi
4. One vacuum gauge
5. Solid-stream nozzles
6. Revolution counter

### B. PROCEDURAL GUIDELINES

1. Review prior year test results
2. Locate a static water source with a minimum water depth of 48"
3. Perform test at sea level
4. Select proper nozzle diameters
5. Remove pre-piped monitor or deck guns and place at ground level
6. Hook up all pitot tubes and gauges
7. Place one gate valve or choke down the valve in line for each deck gun
8. Use all safety equipment that is applicable
9. Determine the net pump discharge pressure correction (IFSTA, pg. 221); see the chart which follow.

### C. 100% CAPACITY FLOW TEST

1. 100% capacity flow test at 150 psi\* net pump pressure for 20 minutes.
2. One 2 1/4-inch tip at 69 psi at the tip equals 1,250 gpm.
3. For this test, nozzle pressure and RPM readings are taken four times: at the beginning and end and twice in the middle with all readings being equally spaced.
4. \*Actual pump discharge pressure is 144 psi instead of 150 (see below).

### D. 70% CAPACITY FLOW TEST

1. 70% capacity flow test at 200 psi\* net pump pressure for 10 minutes.
2. One 1 3/4-inch tip at 93 psi at the tip equals 877 gpm.
3. For this test, nozzle pressure and RPM readings are taken three times: at the beginning, middle, and end with all readings being equally spaced.
4. \*Actual pump discharge pressure is 194 psi instead of 200 (see below).

Answers to the quiz on page 8:

1. false 2. true 3. true 4. false

5. false 6. true 7. false 8. false

## Engine Pump Recertification, Pt. II

All tip and nozzle pressures change with larger or smaller than 1250 gpm pumps. Consult the following chart for the proper layout and pressures.

\*The net pump discharge pressure will always be a little higher when at a draft. The actual pump discharge pressure is the work done by the pump. At a draft the pump has to work to get the water up the hose and into the pump. Therefore, the height of the lift and the friction loss in the suction hose are lost energy and must be subtracted from the pump discharge pressure. In the first example, the 100% capacity test, the actual discharge pressure is 144 but the pump is doing the work as if it were pumping at 150 psi.

### E. FIGURING AN EXAMPLE

Consider a case where a 1250 gpm pump is being tested with 20 feet of hard suction with a diameter of 6 inches:

The lift (distance from the water to the pump intake) = 6 feet

Hard suction friction (taken from the following chart) = 7 psi

The sum of the two equals 13 divided by a constant factor of 2.3 = 5.6, rounded to 6.

For the 100% capacity test (150 psi), subtract 6 from 150 psi which equals 144 psi, the actual pump discharge pressure.

For the 70% capacity test (200 psi), reduce the 6 by one to 5. Subtract 5 from 200 psi which equals 195 psi, the actual pump discharge pressure.

## Theoretical Discharge through Solid Stream Nozzles

Nozzle Pressure PSI	Nozzle Diameter in Inches																				
	1/8	3/16	1/4	3/8	1/2	5/8	3/4	7/8	15/16	1	1 1/8	1 1/4	1 3/8	1 1/2	1 5/8	1 3/4	1 7/8	2	2 1/4	2 1/2	
Feet Head	U.S. Gallons per Minute																				
10	23.09	1.48	3.30	5.90	13.3	23.6	36.8	53.2	72.2	82	94.4	119	148	179	212	248	289	330	378	478	590
15	34.63	1.81	4.02	7.23	16.3	28.7	45.0	65.1	88.4	101	116	146	181	219	260	300	354	400	463	586	722
20	46.18	2.09	4.66	8.35	18.8	33.4	52.0	75.3	102	116	134	169	209	253	300	350	409	468	534	676	834
25	57.72	2.34	5.25	9.34	21.0	37.3	58.3	84.0	114	129	149	189	234	283	336	391	458	521	598	756	934
30	69.27	2.56	5.71	10.2	23.0	40.9	63.7	92.2	125	142	164	207	256	309	368	429	501	572	654	828	1022
35	80.81	2.77	6.21	11.1	24.8	44.2	69.0	99.5	135	153	177	224	277	334	398	464	541	618	708	895	1106
40	92.36	2.95	6.60	11.8	26.5	47.2	73.6	106	144	164	189	239	295	357	425	496	578	661	755	956	1180
45	103.90	3.13	7.03	12.5	28.2	50.1	78.2	113	153	174	200	253	313	379	451	526	613	702	810	1015	1252
50	115.45	3.30	7.37	13.2	29.7	52.8	82.3	119	161	183	211	267	330	399	475	554	646	740	845	1069	1319
55	126.99	3.46	7.77	13.8	31.1	55.3	86.4	125	169	192	221	280	342	418	498	582	678	776	886	1121	1385
60	138.54	3.62	8.08	14.5	32.5	57.8	90.1	130	177	201	231	293	362	438	520	607	708	810	925	1171	1445
65	150.08	3.77	8.45	15.1	33.8	60.2	94.0	136	184	209	241	305	376	455	542	632	737	844	964	1220	1506
70	161.63	3.91	8.73	15.6	35.1	62.5	97.4	141	191	217	250	316	391	473	562	655	765	875	999	1265	1561
75	173.17	4.05	9.08	16.2	36.4	64.7	101	146	198	224	259	327	404	489	582	679	792	906	1037	1310	1619
80	184.72	4.18	9.33	16.7	37.5	66.8	104	150	204	232	267	338	418	505	601	700	818	935	1068	1352	1669
85	196.26	4.31	9.67	17.3	38.8	68.9	108	155	211	238	276	349	431	521	620	722	844	965	1103	1395	1723
90	207.81	4.43	9.89	17.7	39.8	70.8	110	160	217	245	283	358	443	536	637	743	867	992	1133	1434	1770
95	219.35	4.56	10.2	18.2	41.0	72.8	114	164	223	252	292	369	456	551	656	764	892	1019	1168	1476	1824
100	230.90	4.67	10.4	18.7	42.0	74.6	116	168	228	259	299	378	467	565	672	783	914	1043	1194	1512	1866
105	242.44	4.79	10.8	19.2	43.1	76.5	120	172	234	265	306	388	479	579	689	803	937	1070	1226	1550	1916
110	253.98	4.90	10.9	19.6	44.0	78.3	122	177	239	271	313	396	490	593	705	822	959	1095	1253	1586	1957
115	265.53	5.01	11.2	20.0	45.1	80.1	125	180	245	277	320	406	501	606	720	840	980	1120	1282	1621	2005
120	277.07	5.12	11.4	20.4	46.0	81.8	127	184	250	284	327	414	512	619	736	858	1001	1144	1308	1656	2044
125	318.62	5.22	11.7	20.9	47.0	83.5	130	188	256	289	334	423	522	632	751	876	1022	1168	1338	1690	2090
130	300.16	5.32	11.9	21.3	47.9	85.1	133	192	260	295	341	431	532	645	766	893	1042	1191	1362	1724	2127
140	323.26	5.53	12.4	22.1	49.8	88.4	138	199	271	311	354	448	553	668	795	927	1082	1235	1415	1790	2212
150	346.34	5.72	12.9	22.9	51.5	91.5	143	206	280	322	366	463	572	692	824	960	1120	1279	1466	1853	2290

## Engine Pump Recertification, Pt. II: Quiz

Date \_\_\_\_\_

Chief/T.O. \_\_\_\_\_

Firefighter (print) \_\_\_\_\_

Education Credits/  
Hours/Units \_\_\_\_\_

Signature \_\_\_\_\_

### Select the best answer:

1. True or False      Tests may be conducted with deck guns in place.
2. True or False      Pitot tubes should be drained before measurements are taken.
3. True or False      Revolution gauge readings need to be doubled.
4. True or False      Fog nozzles may be substituted for solid-stream nozzles.
5. True or False      Test measurements read truer during a summer heat wave.
6. True or False      Truck gauges should be checked after each test.
7. True or False      You should add back the lift from the water to the pump when figuring net pump pressure.
8. True or False      One individual can easily complete the pump recertification tests by himself or herself.

*(Correct answers can be found at the top of page 6.)*

# Enhanced Training

## Forcible Entry, Pt. III

### Objectives

After watching this program the student shall:

1. become familiar with forcible entry tools
2. learn specific techniques and alternatives for gaining entry

### Standards and Regulations

This training is consistent with NFPA 1500 and appropriate OSHA regulations.

### Training Outline

#### A. EVOLUTION #1

##### Irons/Hinge Entry

Entry Time: 1.5 minutes

1. Use a halligan bar and flat-head ax (or a 10 lb. sledge) to pop hinges on burglar bar doors.
2. Use the point of the halligan and strike it with the sledge using a two-person crew. Using the point rather than the adz end offers sufficient clearance to use this method on a door hinged against a right-hand wall.
3. This is a good alternative to an air chisel or can be used in conjunction with the chisel.

#### B. EVOLUTION #2

##### Air Chisel/Hinge Entry

Entry Time: 35-40 seconds

1. Takes little energy to use; only one firefighter is needed, not a two-person crew.
2. Avoid getting into the frame of the door; keep the chisel on the hinges. Keep the chisel blade on the jamb side of the hinge!

Answers to the quiz on page 11:

1. false 2. true 3. true 4. d. 5. d.

## Forcible Entry, Pt. III

### C. EVOLUTION #3

#### Inward-Opening Steel Door Entry

Entry Time: Approx. 1 minute

1. Pop hinges on any exterior burglar bar door that may be present using either of the methods demonstrated in A. or B. above.
2. Use the irons to open the inward-opening steel door; slide the curved side of the halligan claw against the jamb and strike it with the flat-head ax (two-person crew).
3. The firefighter holding the halligan is in control and directs the ax handler.
4. Alternative method: if conditions don't permit swinging room, the adz end of the halligan can be inserted into the jamb and rocked up and down to pop the door.

### D. EVOLUTION #4

#### Circular Saw (composite)/Tempered Steel Door Entry

Entry Time: 1 minute

##### Outward-opening Doors

1. Cut the throw-bolt of the lock on the door using a 5-10 saw.
2. Maintain high motor revolutions to keep the saw from stalling.
3. Always wear a face shield when operating a saw or any forcible entry tools.

##### Inward-opening Doors

1. Break the door glass using an ax or sledge.
2. Cut out the "panic bar" across the door to allow easy egress.

### D. EVOLUTION #5

#### Circular Saw (carbonite)/Tempered Steel Door Entry

(D'Ax brand shown)

Entry Time: 15 seconds

1. A carbonite-based blade that cuts nearly any material extremely quickly.
2. It's expensive: approximately \$300 per blade.

## Forcible Entry, Pt. III: Quiz

Date \_\_\_\_\_

Chief/T.O. \_\_\_\_\_

Firefighter (print) \_\_\_\_\_

Education Credits/  
Hours/Units \_\_\_\_\_

Signature \_\_\_\_\_

### Select the best answer:

1. True or False      One firefighter can use the irons simultaneously.
2. True or False      Carbonite is stronger than steel.
3. True or False      On hinges, the halligan point works well.
4. When it comes opening doors, you could use:
  - a. the irons
  - b. an air chisel
  - c. a maul
  - d. all of the above.
5. Which of the following is a consideration when choosing forcible entry tools?
  - a. energy expense
  - b. available manpower
  - c. swinging room
  - d. all of the above.

*(Correct answers can be found at the top of page 10)*

# Evolutions 2000

## University of Cincinnati Continuing Education Program

### Comparing Nozzle Characteristics and Uses

If you're enrolled in the **Open Learning Fire Service Program** at the **University of Cincinnati**, here's your opportunity this month to earn one college credit hour for watching *Working Fire*.

#### VOLUME 99-3

#### CARBON MONOXIDE DETECTORS

**Complete written responses to the following three essay questions:**

1. Should fire departments respond to activated carbon monoxide (CO) detectors whether or not there are reported illnesses?
2. Should CO detector responses be emergency, cold, or varied, depending on reported conditions.
3. What is your policy and what improvements would you recommend, if any?

**Submit your responses to:**

**Mr. Bill Kramer  
University of Cincinnati  
College of Applied Science  
2220 Victory Parkway, ML #103  
Cincinnati, OH 45206**

#### ENROLLMENT INFORMATION:

For more information on enrolling in the Open Learning program to gain college credit, call *Working Fire* at 800-516-3473 for a brochure or, to register directly, call the University of Cincinnati at 513-556-6583. Associate and Bachelors programs are available. Call to have your transcripts evaluated.