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Subject: FIRE OFFICER 1 REVIEW.doc

FIRE OFFICER 1 REVIEW

ACTIVE TRAINING

Boredom with subject matter is a problem faced by anybody who teaches a subject repeatedly. Three steps to combat this are:

1. Be flexible with lesson plans and designs.
2. Vary the location and environment.
3. Watch others teach the same program.

Classroom design: circles or squares afford the best views for each participant and are best for group discussions with few trainer-led presentations or sub-group projects.

Expect participation from everybody.

Insist on punctuality.

Move at a steady pace through a planned agenda.

Get a groups attention by flicking a light switch, clapping hands, telling a joke.

Group hostility: participants are likely to transfer hostility they are feeling now towards the presenter.

Avoid jargon or unfamiliar terms that might confuse people.

Body language: not just what you say, but how you say it. 7% of the received message is what you say, 93% is from how you communicate non-verbally.

Mini-subject review: Take a few minutes to review what you've already covered. Allow the participants to prepare for what's coming next.

Ask groups of 5 or more to appoint a facilitator and a timekeeper. Very important group roles.

Final questions and concerns: leaving with unanswered questions or concerns invites students to reflect on course material once the class is over.

Final assessment: 4 levels of evaluation:

1. Reaction
2. Learning
3. Behavior
4. Results

FIRE COMPANY OFFICER

Overall job of the company officer is to create within the company itself an environment which will facilitate the accomplishment of its objective.

The CO is responsible for the environment in which his subordinates work. They plan the operation of subordinates, train them, organize their roles and relationships, direct their work and evaluate the results.

CO's are planning when they decide which objectives or goals they will pursue, when they will be achieved, and exactly how their resources, manpower, equipment and time will be devoted to their achievement.

Good feedback: ever-present resistance to change is somewhat diminished. Number one motivator of people is feedback on results.

Responsibility cannot be delegated.

Not only are CO's responsible to their subordinates; they are responsible to the group, the organization and themselves.

Leadership: the art of inducing subordinates to accomplish their assignments with enthusiasm and confidence.

Lack of motivation will cause decline in enthusiasm and confidence.

Leadership has two major ingredients: Ability to motivate and inspire.

Objectivity: observe and trace causes of events unemotionally.

Span of control: 5

Unity of command: Single superior.

Be objective with grievances.

Resistance to change: All change is met with resistance, the degree of which is governed by how much it affects the individual. Key is to alleviate the hostility.

Supervisor is supportive, helpful and friendly; rather than hostile.

CO should be flexible.

BUILDING CONSTRUCTION

Definitions of:

Impact loads

Axial loads

Cantilevered loads

Self-releasing floors

Fire stopping

Chipboard

Siding and sheathing

Roofing, classes A, B and C with C being the least fire resistive.

Practical limit of a wood beam is 25 feet.

Fire-cut joists

Know elongation of steel at 1000 degrees-

Steel will expand .06 to .07% for every 100 degree rise in temp.

Know definitions of and differences between pre and post tensioning of concrete.

Know when and when not to cut concrete with saws or power tools.

Know the stack effect of smoke travel through a building.

FIRE PROTECTION SYSTEMS I

Dry systems: NFPA 17

Wet systems NFPA 17A

Hood systems NFPA 96]

Mining equipment (mobile equipment) NFPA 121

Municipal water systems supplied in grids with primary feeders, secondary feeders and distribution lines.

Hydrant separation: generally no more than 800 feet, 500 feet in closely built areas.

Color of barrel or cap indicates hydrant capacity:

Blue: 1500gpm or greater.

Green: 1000 to 1499gpm

Orange: 500 to 999gpm

Red: less than 500 gpm.

Know, gate and OSY valves, location of stem on OSY valve when open or closed.

Know difference between centrifugal and displacement pumps. Also multi-stage pumps.

Electric pump drivers (motors) most prevalent.

NFPA does not recognize pump motors driven by gas or LP

Fire pumps must be tested annually.

Sprinklers:

Ordinary sprinkler heads will be unpainted or black: if frangible glass bulb, will be red or orange with temp rating of 135 to 170 degrees.

Extra high rating will be painted red and or bulb will be purple. 325 to 375 degrees.

Pendant-type heads hang down and direct water downward.

Fast-response sprinklers go in residences and sleeping areas.

Pre-engineered suppression systems are designed for general installation and all components and capabilities of the system are designed by the manufacturer. Engineered systems are designed for a single specific application and must be assured of compliance by the individual contractor.

Detection devices: thermostats and fusible links, also fire rated detection wire (most common in vehicles).

Listed parts are those specifically tested under UL or FM guidelines and approved by the manufacturer for use in a system. That means the part has been tested and quality control is ongoing during the production of that part. Failure to use listed components will void any liability of manufacturer.

Inspections and maint. Must be preformed by a licensed company.

Know components of wet and dry systems: Agent tank, delivery gas, nozzles, detection devices, delivery piping, etc.

All hood systems shall have both automatic and manual triggering devices and they shall be separate and independent of each other.

When two or more systems are used to protect a single hazard they shall be arranged for simultaneous operation.

All components of a pre-engineered system must be listed.

Two types of fixed dry chem. systems: Total flooding and local application.

Sprinkler systems:

4 basic systems:

Wet Pipe

Dry pipe

Preaction

Deluge

Major system components:

Risers, mains and branch lines; sprinkler heads on branch lines.

Inspector's test valve is at the end of the system.

Know types of supervisory methods.

Quick response sprinklers enhance life safety.

Know standpipe classes: Class I, II and III. Class I and III can be used by firefighters.

Extinguishers:

Incipient stage of fire: when fire can be approached in normal work clothes.

Classes of fire: A,B,C,D, K

Extinguishers must pass all three tests, three times for rating.

NFPA recognizes three types of fire hazards: light, moderate and high.

Know examples of each.

Know how class A and B extinguishers are classified, the higher the rating, the more fire it can put out.

Actual max walking distance to extinguishers:

A- 75ft.

B- 50 or 30 ft depending on size of extinguisher

C- 75 ft

D- 75 ft

Know inspection intervals, what is to be done monthly, annually or semi-annually. Hydro dates.

Alarm systems:

Heat detectors: Fixed temp, rate-of-rise

Smoke detectors: ionization and photo-electric

Pull stations located in the path of exit.

Restorable vs non-restorable heat detectors

Know types of signaling devices.

Tactics and Strategy I&II (Clark book)

Fire triangle and tetrahedron.

Rate of reaction is doubled for every 18 degree temp rise. (Charles Law)

Know types of heat transfer: radiation, convection, conduction, etc.

Flashover: sudden full involvement of everything in a room, around 1000 degrees.

Critical flow rate: minimum gpm needed to extinguish a given fire.

Fog streams are effective on high flashpoint liquid fires. Not effective on gasoline or other liquids with flash points below 100 degrees.

Fluoroprotein foam can be used for sub-surface application.

AFFF is fast-spreading and low viscosity.

HALON used in fixed installations with sensitive equipment such as computers.

Basic rules of firefighting strategy: locate, confine and extinguish.

“Rescue” should not be applied to the routine transportation of invalid persons.

General strategic plan: What is to be done, What do you need to do it, Who is to do it?

Ideal rate of flow: volume divided by 100= gpm

Span of control: 5 is optimal.

Chance of fire extension vertically is greatest.

Fire can move through a building via stairways, elevator shafts, light and air shafts, hallways, ducts, wire chases, etc.

Smoke color is different by day and night.

Grass and brush give off a light gray smoke in the distance.

Good cross ventilation can be accomplished by opening windows on the leeward side at the top and the windward side at the bottom.

First quality firefighters want in their officer is fairness, then ability.

Sprinkler flow: maintain 10psi at the highest and farthest fused head.

The aerial ladder can be raised more quickly than a platform and is fine for rescue.

When sprinklers are present one of the first lines should go to the sprinkler Siamese.

High-rise fires: lower command post established in the lobby, upper command post two floors below the fire and staging the floor below the fire.

Inspection Practices

Permit: Official document that grants a property owner permission to perform a specific activity.

Fire prevention inspections are the fire service's most important non-emergency activity.

Fire inspectors should avoid at all cost any action that might involve the jurisdiction in a civil rights case.

Property owners may legally refuse admittance to an inspector who has not obtained a proper warrant.

Fire inspectors should exchange information with other agencies.

Federally owned buildings are not required to comply with local codes.

A permit may be revoked if an inspection shows that false statements or misrepresentations were made on the application.

Fire department management should provide fire inspectors with information regarding the statutes they are responsible for enforcing.

Insurance company requirements are often targeted more at property protection than life safety.

If a property owner requests to modify a local code the substitution must provide an equal or greater level of protection.

A revised edition of a model code takes effect when the AHJ formally and legally adopts it.

The fire marshal typically is responsible for a fire department's inspection activities.

Know differences between floor plans, elevations, plot plans.

It is easier to convince an occupant to make a fire safety change voluntarily rather than using legal mean to force the change.

Fire inspectors may allow occupants to cover secret business processes.

The key to success for fire inspectors is communicating and dealing with people.

Fire inspector should portray a helpful attitude.

In most cases, businesses should be inspected during their normal hours.

A common method for performing an inspection is to follow a manufacturing process from beginning to end within the structure.

If an occupant refuses to unlock an area note it and move on.

The higher the flame spread rating, the more hazardous the material.

Know the Steiner Tunnel Test: what type of wood used, what does it measure, other names for it. (UL 723, ASTM E84, NFPA 255)

Fire walls are required to be self supporting.

Cementations and mineral fiber coatings are a type of fire retardant use primarily on steel structural members in the past.

Bonding: Connecting two objects that conduct electricity with another conductor.

Maintaining a humidity of 60 to 70 percent greatly reduces the static electricity problems associated with manufacturing paper, cloth and fiber.

Incineration is effective in destroying medical, chemical and biological wastes.

An active smoke control system may exhaust combustion products through the building's HVAC system.

Any oil quenching tank over 500 gal must have bottom drains that open automatically or manually in the event of a fire.

Max height for stacks of lumber in open yard storage in a lumber yard is 20 feet.

Recommended minimum distance between sprinkler heads and the top of stacks in a recycling plant is 18 inches.

The biggest fire concern with HVAC systems is the fire hazard caused by the heating appliance.

Unless specially designed for lower clearance, cooking equipment must be a minimum of 18 inches from combustibles.

Know NFPA building occupancy classifications.

Know egress, exit, exit access and exit discharge.

Phase I, II and III evacuations in health care facilities.

Driveways should provide easy access for the largest fire apparatus expected to respond.

The Life Safety Code is NFPA 101.

Access is made to a smoke proof enclosure through a vestibule or outside balcony.

Fire escape stairs should be exposed to the fewest possible door or window openings.

Exits should be located as remote from each other as possible.

Most occupancies should conduct fire drills twice a year.

Standpipes cannot take the place of sprinklers in high-rise structures.

Residential systems with two or more sprinklers require 18gpm for each sprinkler per NFPA 13D.

A wet pipe system equipped with a fire pump must be flow tested annually.

Low point drains in a dry system should be tested each fall.

Residential sprinklers operate more quickly than conventional sprinklers.

Gravity tanks, manual fire pumps and pressure tanks may supply water for standpipe systems.

Supervisory air pressure in a pre-action sprinkler system should be checked weekly.

Residential sprinkler systems are required to have a minimum 30 minute water supply.

A dry pipe system's air pressure should be kept at 15-20 psi above the trip point.

Know properties of low, medium and high expansion foams.

Fluoroprotein foams contain surfactants that allow it to shed or separate from hydrocarbon fuels.

A central station alarm system is one in which each protected building is wired into a common receiving point at an outside contracted service point.

A system's primary power supply usually consists of the building's main connection to the public electric utility.

The system control unit is the "brain" of the alarm and detection system. Often referred to as the alarm or annunciator panel.

A fusible link melts under fire conditions, releasing a spring that completes an electrical connection.

Photo-electric smoke detectors operate when smoke particles break a beam of light.

Ionization smoke detectors operate when combustion causes an electron imbalance among molecules.

Know classes of extinguishers, along with the color and design of their labels. I.e.: Class B extinguishers are marked with a red square.

Flame resistant wool is suitable for use in fire blankets.

The property or building owner is responsible for inspecting portable extinguishers.

Travel distance to the nearest fire alarm pull station should not exceed 200 ft.