TOPIC: Earthquake Preparedness and Survival

TIME FRAME: 2 Hours

LEVEL OF INSTRUCTION:

BEHAVIORAL OBJECTIVE:

Condition: A written quiz

Behavior: Student will list and describe the principles involved in preparing for a major earthquake.

Standard: With a minimum of 70% accuracy

MATERIALS NEEDED:

- Appropriate visual aids
- Audio visual equipment
- Fire station or individual residence for assessment purposes

REFERENCES:

- Earthquake California Style, State OES
- Earthquake Preparedness VCR Tape - City of Los Angeles KCET-TV "Preparing for the Big One"

PREPARATION: This is California, the land of earthquakes and earth slippage. As firefighters we have two equal responsibilities. One, to prepare our families as best we can to withstand a major earthquake and second, to respond appropriately to assist the general public after the "Big One" hits. If we haven't done the former, we can't do the latter!!

PRESENTATION	APPLICATION

I. INTRODUCTION

A. Faults in California

1. Cause of all earthquakes
2. No area of California is safe from a quake
3. Network the entire state

B. Seismological Predictions

1. Loma Prieta quake
   a. May be the trigger mechanism for a larger earthquake.
   b. Hayward/Calaveras Fault may be next and may be triggered by Loma Prieta incident.
2. San Andreas Fault has not had the tension removed from it.
   a. Seismologists predict a great quake (7.5 Richter or greater) in the next 30 years.
   b. This is not an if situation. It is a when situation.

C. Loma Prieta Damage

1. Was a 7.1 quake

October 17, 1989
How high on the Richter scale was the Loma Prieta quake?

2. Did major damage to highways and masonry buildings
3. Damaged many buildings with weak foundations.

PRESENTATION	APPLICATION
4. Was not a great quake	
5. Stretched local emergency services to their limit for the first 48 hours	
II. BASIC PREPAREDNESS	
	Information sheet #1
	NOTE: If you prepare at home and at the fire station, you will be able to put full energy into the huge problem ahead of you.
A. Home and Fire Station	
1. Structure Assessment	
	Information sheet #2 & #3
a. Check foundation	
(1) Mudsill plate bolted to concrete foundation	
(2) Piers adequate lateral support (cross bracing)	
(3) Cripple wall needs to have plywood nailed to inside of framing	
b. Windows	
(1) Large plate glass windows are an extreme hazard in a big quake	
(2) If financially feasible, change to safety type glass	

PRESENTATION	APPLICATION
(3) Beds should not be near large windows	
c. Large furniture and appliances	
(1) Any large, heavy furniture needs to be stabilized,	
	Information sheets #4, 5, 6, and 7
(a) Bolted to the studs in the wall	
(2) Cabinets should have secure latches	
(3) Heavy objects should be moved to lower shelves or the floor	
(4) Beds should not be near large, tall furniture	
(5) Water heaters secured to wall	
d. Utilities	
	Information sheet #8
(1) Be familiar with their location	
(2) Have tools handy for propane/natural gas shut-off	
	What type of tools can you use?
(a) Crescent wrench	
(b) Universal spanner	

PRESENTATION	APPLICATION
(3) Know how to shut the water off	Where is the utility shut off at your station, at home?
(4) Know how to shut the electricity off	
2. Earthquake supplies	
a. Dry, canned, and bulk goods for everyone	What is the basic advice on the amount of food that should be stored?
(1) At least 7 days per person	
b. First aid supplies	
(1) Medical services may not be available in a great quake	
(2) Roads may be impassable	
(3) Large enough supply to take care of immediate first aid needs.	
c. Flashlights/light sources	
d. Stove or cooking facilities	
e. Cooking and eating ware	
f. Bedding	
g. These items need to be pre-packaged and stored in a safe dry space	

PRESENTATION	APPLICATION
h. Bottled water for at least 7 days per person	
	NOTE: Each person requires 1/2 to 1 gallon of water per day
i. Some form of portable shelter	
3. Escape routes/safe places	
	Information sheet #9 and #10
a. Preplanned escape routes	
(1) Away from large glass objects	
(2) To strongest part of structure	
(3) If indoors, stay indoors	
b. Safe places	
(1) Under big desks	
(2) Under large furniture that will not collapse	
	Doorways and reinforced arches are usually the strongest part of a structure
(3) Doorways (heavy framing)	
4. Hazards	

PRESENTATION	APPLICATION
a. Overhead power lines	NOTE: All or some of these may be broken in the street or in houses.
b. Natural gas lines	
c. Propane tanks	
d. Water mains	
e. Windows	
f. Heavy objects	
(1) Furniture	
(2) Items on shelves higher than waist	
B. Vehicle	
1. Survival kit	NOTE: A good practice would be to carry as much of this as possible when traveling
a. Emergency food supply (small)	
b. Emergency first aid kit	
c. Maps	
d. Blankets	
e. Jackets	
f. Flashlight	

PRESENTATION	APPLICATION
g. Drinking water 2. Vehicle hazards a. Overpasses, stacked highways, and enclosed parking garages (1) May collapse (2) If under one - move to open area immediately (3) If this is not possible get between, NOT UNDER, the concrete cross supports (4) Stay in vehicle, get low, preferably on the floor (5) Wait for shaking to stop and move out of covered area. (Even if this requires abandoning the vehicle) b. Roadbed collapse (1) Roadway may be destroyed (2) Area subsidence (a) Areas of highway may drop off (3) Drive slowly - be aware that the road may not be where it is supposed to be	NOTE: In Alaska in 1964, portions of highways dropped as much as 8 feet. This literally left cliffs that cars drove off.

PRESENTATION	APPLICATION

c. Powerlines

(1) May be across roadbed

(2) Don't stop under during a quake

d. Trees

(1) May be across roadbed

(2) Don't stop under during a quake

3. If in a safe location (i.e, open sky above) stay there

4. Assess situation

a. Check for injuries

b. Determine if people are trapped

c. Check for gas leaks

(1) Turn off any gas line necessary to stop leaks

(2) If natural gas main is broken, evacuate to upwind location

(3) Remove ignition sources

d. Check for downed and damaged electric lines

(1) If necessary, shut off power

(2) If gas leak present, always shut off power in entire area

(3) Be prepared to deal with many downed power lines

e. Assess structures

PRESENTATION	APPLICATION
(1) Determine if structure will withstand after shocks	
(2) If obvious structural damage is present, evacuate building	
f. Check telephones	
(1) If they work, you are connected to help	
(2) If not working, check periodically	
(3) Make sure all telephones are on the hook	
	NOTE: After a quake, thousands of telephones may be simultaneously knocked off hook. This overloads all the central circuits making telephone communication impossible.
g. If outside assistance is needed seek help	
	What are some alternate ways of communication if phones are out?
(1) Citizen's band radio	
(2) Fire service radios	
h. Move engines outside	
(1) If the apparatus room has collapsed	

PRESENTATION	APPLICATION
(a) Remove debris as quickly and safely as possible (b) If apparatus is destroyed, notify ECC (c) Move functional apparatus to a safer location (2) If apparatus room is standing (a) Move apparatus outside and leave it there (b) Move apparatus far enough away that the building will not fall on it (c) Make sure not to park under electrical lines or on top of gas mains (3) After-shocks are sometimes larger than the first quake - so plan on leaving it all outside	Should the fire engines be moved back inside when the quake is over?
C. Render Aid to the Community	Information sheet #11 and #12
1. Be imaginative - we have many resources a. Dozers b. Helicopters c. Engines	

PRESENTATION	APPLICATION

d. Air Attack (Recon)

e. Incident Bases

f. Fire Crews

g. ICS

2. Ranger units wide priorities

a. Hospitals

b. Schools

c. Convalescent homes

d. Shopping centers

e. Multi-story structures

f. Other high occupancy structures

D. Contact or Make Contact with All Personnel Families

1. Assess their condition

2. In extreme cases release personnel to home emergencies

3. It may be useful for all personnel to arrange some alternate methods of contacting family members

a. Calling out of State may be substantially easier than within the disaster area

b. Prearrange to have someone out of state be prepared to take messages and relay them to other family members

SUMMARY:

Get ready. A big, nasty disaster in the form of a great quake is coming. It may occur very soon. Station and home considerations should be taken care of immediately.

EVALUATION:

A written quiz.

ASSIGNMENT:

To be determined by instructor(s).