

TRAINING BULLETIN

RADIO FREQUENCY (RF) RADIATION HAZARD AWARENESS

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INTRODUCTION:

There are different types of radiation. There is solar, nuclear, and Radio Frequency, or RF radiation. RF Radiation is emitted by radio transmitters and can be harmful in high dose intervals. The danger of RF Radiation is caused by the intense energy emitted by high power radio transmitters. It is important for members to be able to recognize Cellular, Microwave, Satellite and Radar antennas in order to work safely around them. In addition, the ability to recognize the potential danger of RF (Radio Frequency) Radiation is vitally important to member safety as well as how to minimize exposure to RF Radiation. Because the amount of radiation from an antenna you will become exposed to is unable to be known, the best advice is to ***“Only become exposed as long it takes to walk by, and walk as far away as possible.”***

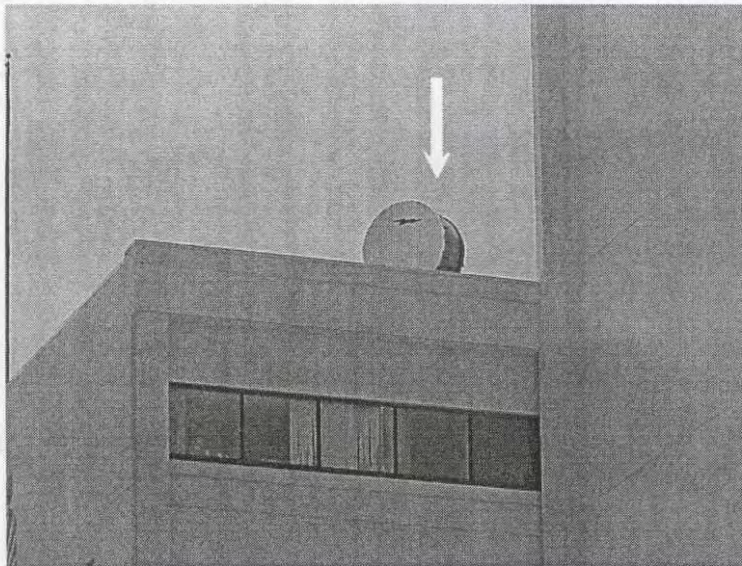
Remember, a microwave oven has a high frequency transmitter in it that speeds up the molecules of the matter in its compartment and cooks it. **Over-exposure to RF energy in rare cases can cook you too!**

ANTENNAS:

There are several types of antennas and systems firefighters will be exposed to while performing their duties. They are as follows:

- A. Microwave Dishes
- B. Radar Installations & Antennas
- C. Cellular Sites
- D. Satellite Antennas
- E. Base Station Radio Antennas
- F. Mobile & Portable Radio Antennas

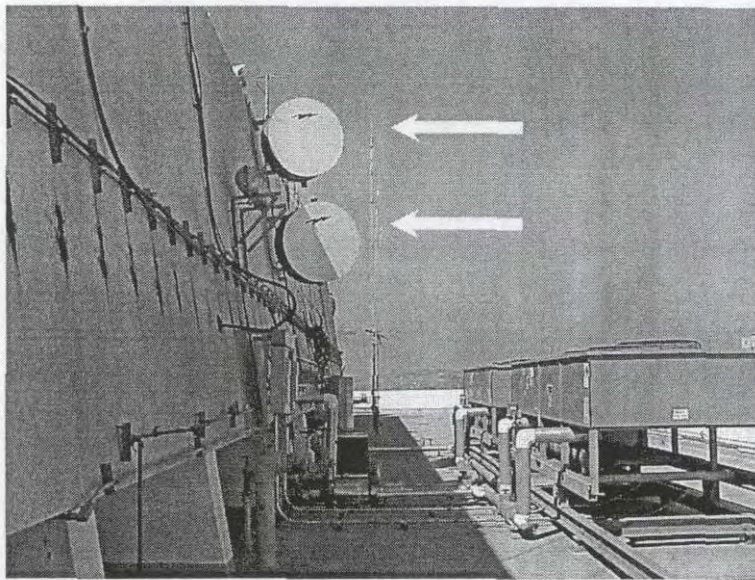
MICROWAVE DISHES



This is an example of a microwave antenna on a building rooftop. Microwave antennas, or dishes are directional and pose little danger from behind or beneath, but do not stand directly in its transmission path.

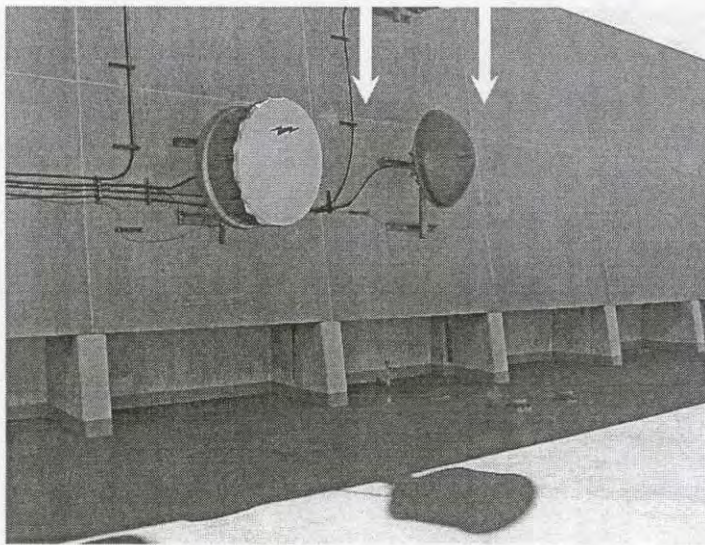
This type of antenna/dish can be harmful if a member were to walk in its path. Exposure to this antenna should be no more than the time it takes to walk by it. ***“Only become exposed as long it takes to walk by, and walk as far away as possible”.***

MICROWAVE DISHES, CONT.



This is a photo of a microwave dishes on the roof of City Hall East. The best path to approach these dishes is close to their supporting wall, and stay underneath their transmission path. These dishes are tall enough that you can walk underneath them. ***“Only become exposed as long it takes to walk by, and walk as far away as possible”.***

MICROWAVE DISHES, CONT.



This is a photo of two low-lying microwave dishes on the roof of City Hall East. Working around these dishes is more hazardous because they are too low to walk under. In this case, you would want to walk as far away as possible from them. This is another case where you would not want to conduct roof operations directly in front of these microwave dishes. ***“Only become exposed as long it takes to walk by, and walk as far away as possible”.***

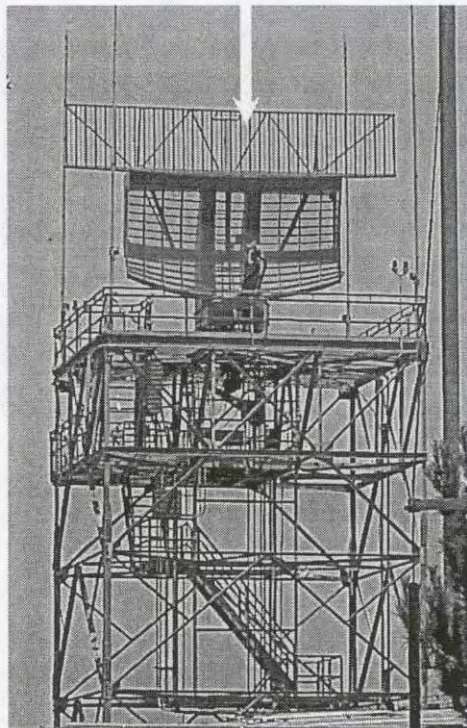
MICROWAVE DISHES, CONT.



This is an example of microwave dishes & cellular antennas mounted on a hotel in Hollywood that is on a penthouse, making exposure less likely to firefighters on the roof. ***“Only become exposed as long it takes to walk by, and walk as far away as possible”.***

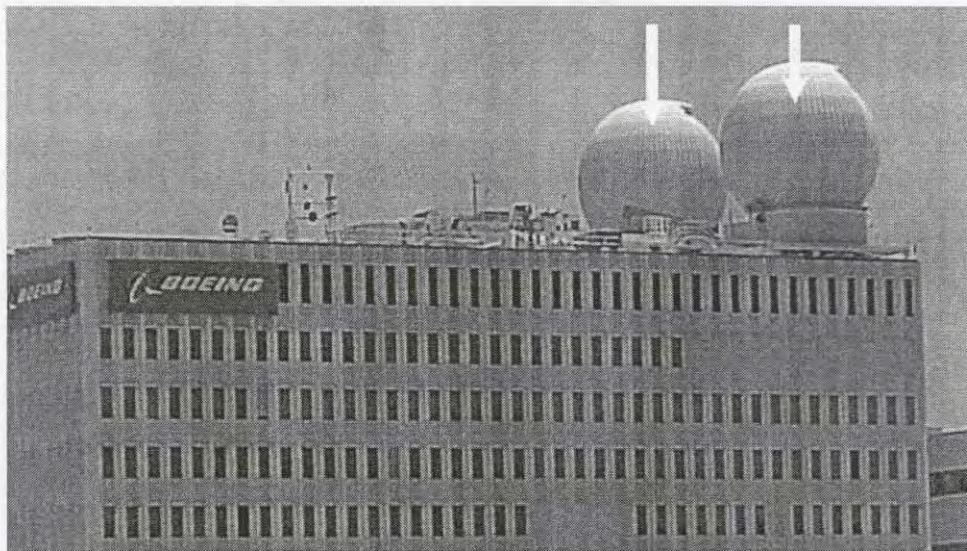
RADAR INSTALLATIONS:

Radar installations in civilian buildings are uncommon. Most radar installations are in the vicinity of airports or military installations, or contractors. Great care must be used when in the vicinity of radar installations as they are potentially life threatening. Always assume a system is active and is potentially dangerous. Keep exposure to a minimum. These installations have a much greater exposure path.



There are two types of radar antennas. Type 1 has a rotating external visible antenna. If the antenna is rotating, the system is active. ***“Only become exposed as long it takes to walk by, and walk as far away as possible”.***

RADAR INSTALLATIONS, CONT.



Type 2 has the rotating portion of the antenna in a dome making activity determination difficult. These domes can emit very large amounts of RF radiation and can be potentially life-threatening to approach them if they are active. Confirmation of de-energization must be made prior to roof operations commencing. This rooftop near LAX could be extremely hazardous if the radar is operational and at full power. ***“Only become exposed as long it takes to walk by, and walk as far away as possible”.***

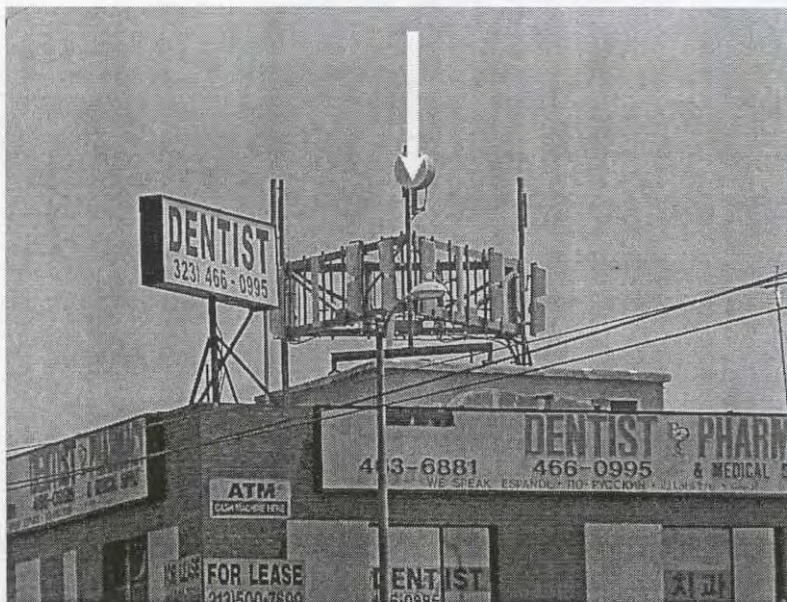
RADAR INSTALLATIONS, CONT.



Boats & Ships also have lower powered radar systems, but they are still hazardous if you find yourself in its path. There is no safe way to approach a rotating radar antenna. De-energize the system by having the ship's radar officer do so. This antenna is the radar antenna on Fire Boat 2. No maintenance should be done near this antenna when it is rotating.

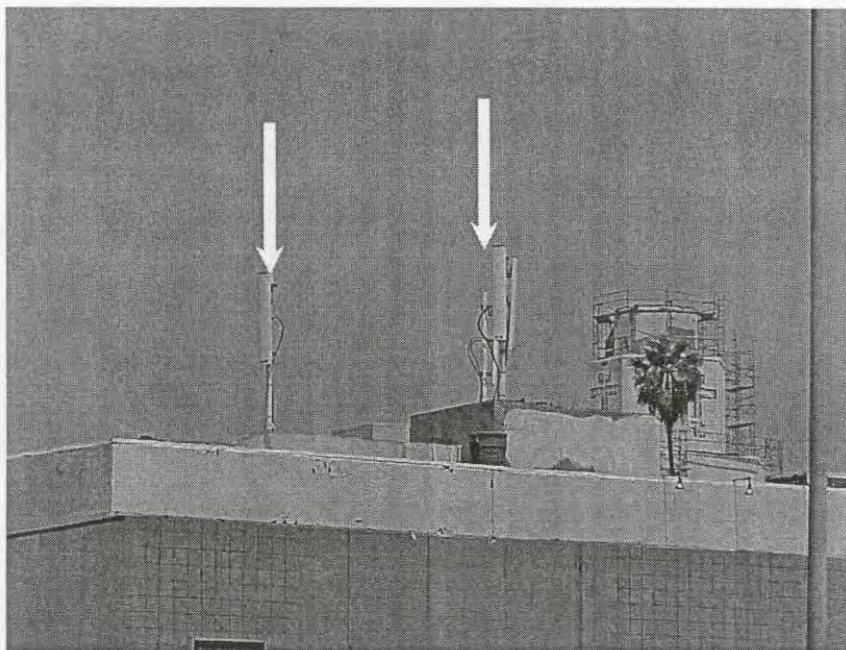
CELLULAR SITES:

There are numerous cellular sites throughout the City. Many are mounted on stand-alone towers and building tops.



This cellular site is located at Santa Monica & Western. Members laddering, or conducting roof operations on this building should use care not to walk in front of the antenna paths. This site has the antennas slightly elevated on a penthouse. De-energizing the building's power will not deactivate this site as most cellular sites have generator back-ups. ***“Only become exposed as long it takes to walk by, and walk as far away as possible”.***

CELLULAR SITES CONT:



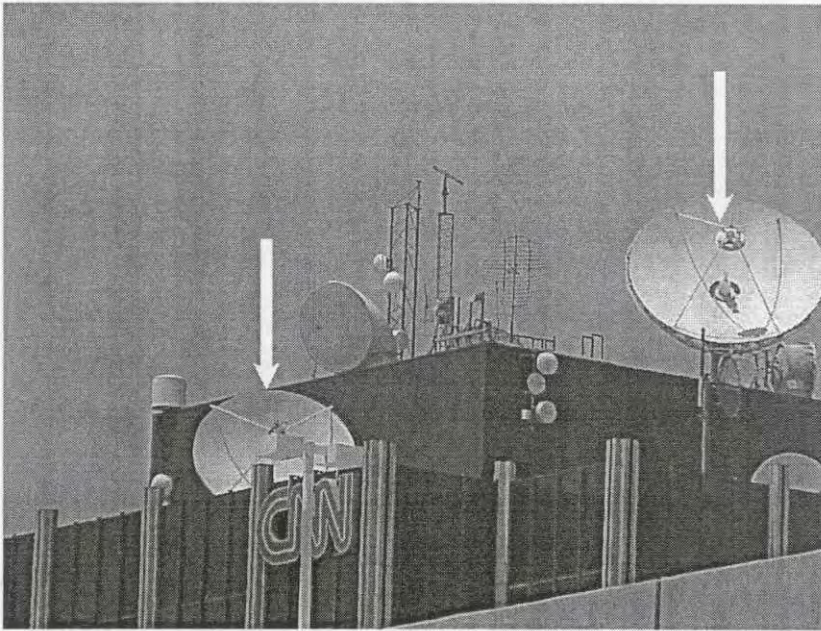
This is a smaller cellular site on Western at the Hollywood Freeway. It only has three antennas. The risk is higher than the other site because these antennas are not as elevated and direct exposure to members on the roof is greater. De-energizing the building's power will not deactivate this site as most cellular sites have generator back-ups. ***"Only become exposed as long it takes to walk by, and walk as far away as possible"***.

CELLULAR SITES CONT:



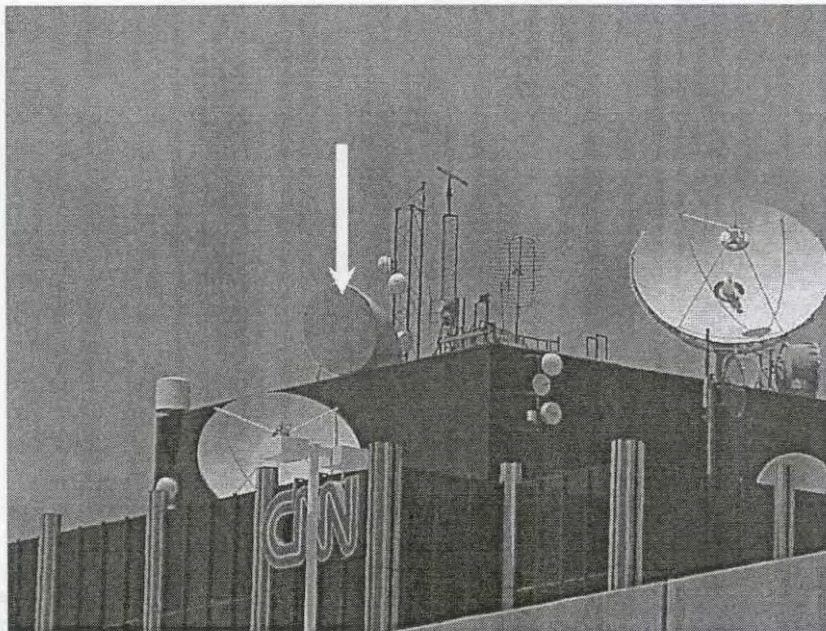
This cellular site poses little exposure to members because it is elevated approximately 60 feet above the ground. If rescue of a worker on the site was necessary, stay below and behind the antennas. De-energizing these sites to make them inactive is difficult as they have built in battery back-up systems and generators that must be shut off from inside the building. The cellular provider's technical staff, or the City's ITA, or Tech. Control could assist in de-energizing them time permitting. All of these resources have extended response times.

SATELLITE ANTENNAS:



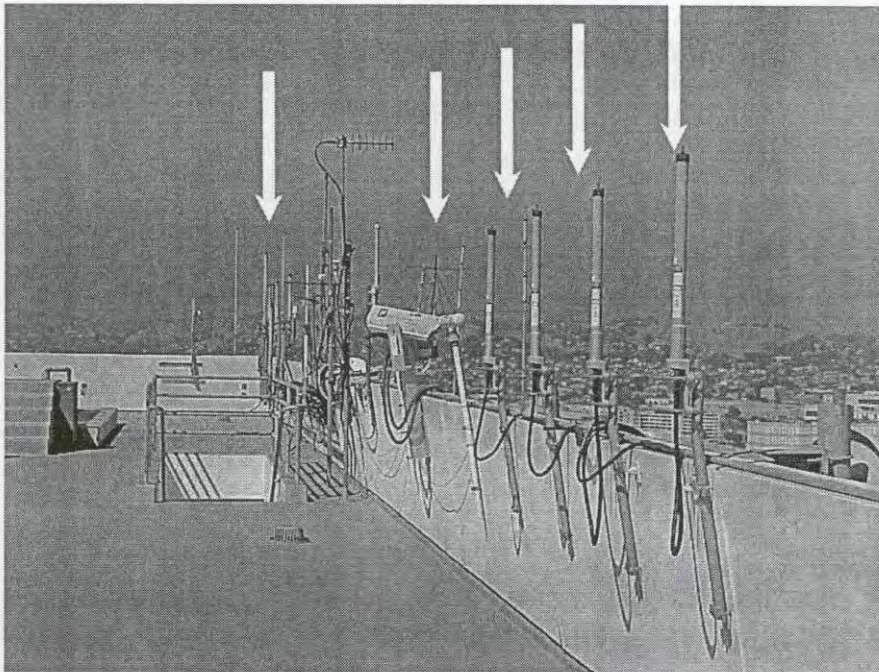
This rooftop in Hollywood has a good cross-section of antennas. The satellite dishes are fairly safe as they are elevated and send their signal at a high angle. ***“Only become exposed as long it takes to walk by, and walk as far away as possible”.***

SATELLITE ANTENNAS CONT:



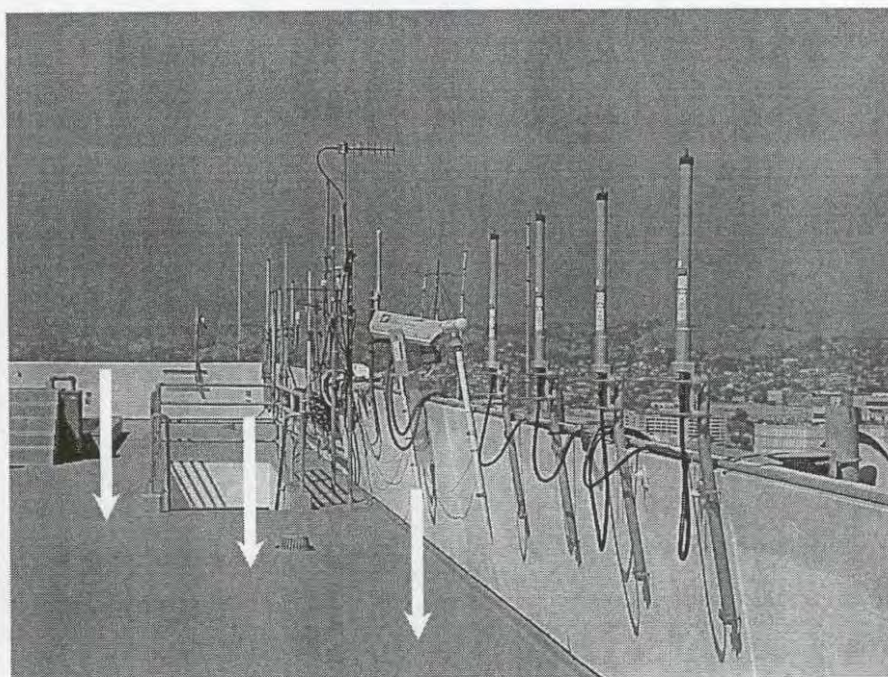
This Microwave dish poses little danger because it hangs over the penthouse wall, well over the height of a firefighter and no direct walkway in front of it. ***“Only become exposed as long it takes to walk by, and walk as far away as possible”.***

BASE RADIO ANTENNAS:



Radio antennas can also pose a health hazard with long term exposure. This antenna array on the roof of City Hall East demonstrates a high RF environment. This is another case of ***“Only become exposed as long it takes to walk by, and walk as far away as possible”***.

BASE RADIO ANTENNAS:



This is an example of an area that would be considered not desirable due to the potential RF environment.

MOBILE & PORTABLE RADIO ANTENNAS:

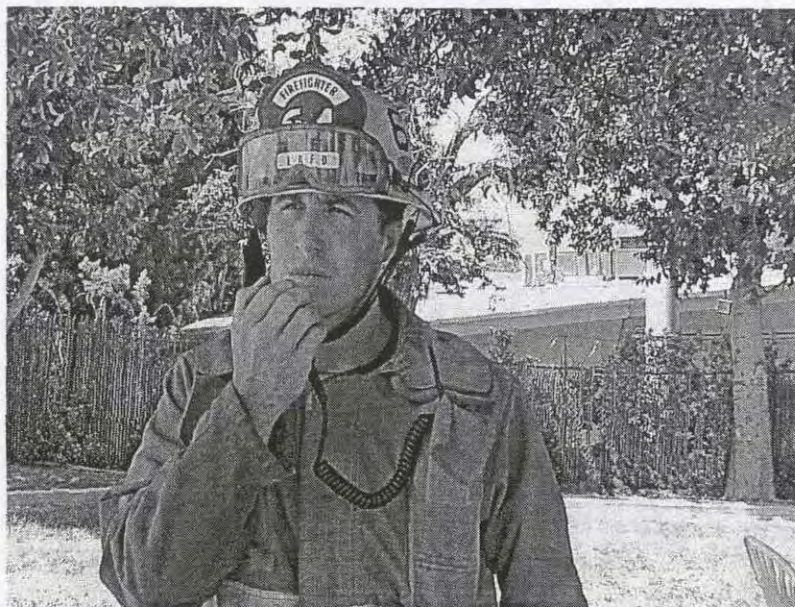


Members operating mobile radios or MDC's should ensure that the roof is clear before transmitting, or updating the MDC status.



There is minimal RF exposure to the member when the radio is held properly with the antenna tip at least 6 inches from the eye.

MOBILE & PORTABLE RADIO ANTENNAS:



A safe RF Radiation level is also maintained when the portable radio is placed in the turnout, or brush jacket pocket.

CONCLUSION:

RF radiation in large or prolonged doses can pose a health risk to members. Members should spend as little time as possible around microwave dishes, antennas, radar antennas and cellular sites. Questions regarding RF radiation can be directed to FCCS II at (213) 978-8350.