

**AC power circuits, antenna installation, RF hazards Chapter 9**  
**[3 Exam Questions - 3 Groups]**

**Electrical Hazards**

Electric current in the body causes tissue **heating, disrupts cell functions, involuntary contractions**  
**30 volts** is the lowest voltage that is a dangerous electric shock

**Electric shock** can occur from **capacitors in power supply** when it is turned off

A **fuse interrupts power** in case of overload

Installing a 20-ampere fuse in the place of a 5-ampere fuse **could cause a fire**

A 120V AC "hot" conductor **fuse / circuit breaker** in should always be in home-built equipment

Safety ground is connected to the green wire in a three-wire electrical AC plug

Use **three-wire plugs, common safety ground, GFI** to guard against electrical shock

Ground to a **common plate / external ground for lightning protection** in a coaxial cable feed

Ensure **connections are short** when installing ground wires on a tower **for lightning protection**

A **12-volt storage battery hazard** is **explosive gas** is vented

If **charged too quickly lead-acid battery** a could overheat /give off flammable gas / explode

**Emergency recharge** by connecting **12-volt lead-acid battery** to a car's battery and run the engine

**Antenna Tower Safety**

A tower work team wear a **hard hat and safety glasses at all times**

Put on a **climbing harness and safety glasses** before climbing an antenna tower

**Always have an observer** or helper when climbing a tower

A **crank-up tower must never be climbed** unless it is in the fully retracted position

Use a **gin pole** to lift tower sections or antennas

**Never attach an antenna to a utility pole** the antenna could contact high-voltage wires

**10 feet to the power wires is the min safe distance** from a power lines when installing an antenna

Look for and **stay clear of any overhead electrical wires** when putting up an antenna tower

Ground a tower with separate eight-foot long **ground rods for each tower leg**

**Sharp bends must be avoided in grounding** conductors used for lightning protection

**Local electrical code establishes grounding requirements** for an amateur radio tower or antenna

**Radio Frequency Radiation Exposure Hazard**

VHF and UHF radio signals are **Non-ionizing radiation**

50 MHz has a low **Maximum Permissible Exposure limit**

**More than 50 watts PEP** at the antenna **require an RF exposure evaluation** at VHF frequencies

**Frequency, RF Power, Distance & Radiation Pattern** of the antenna affect the RF exposure

**Human body absorbs more RF energy at some frequencies** than at others

**FCC OET Bul 65, computer model or field strength meter** determine complies with RF

A **painful RF burn** could happen if a person accidentally touched your antenna

**Relocating antennas** might prevent exposure to RF radiation in excess of FCC limits

**Re-evaluating the station whenever equipment is changed** to ensure RF safety

**Duty Cycle** affects the average exposure of people to radiation

**Duty Cycle** is the ratio of on-air time to total operating time of a transmitted signal