SAFE SHELTERS USING STEEL SHIPPING CONTAINERS

High frequency current flowing through a conductor generates an electromagnetic field, one effect of which is to confine the current towards the outside of the conductor. This is known as "skin effect" while the thickness of the layer to which most of the current is restricted is known as "skin depth." The higher the frequency, the smaller the depth of current penetration.

For a copper (wire) conductor at 50Hz the skin depth is on the order of 10mm. However, lightning has a much higher frequency (5-30MHz?). Since skin depth is proportional to the square root of the inverse of the frequency, penetration on copper is less than 1mm. With higher resistance steel, it is even more surface-limited. Thus metal "cages" such as vehicles and shipping containers are safe refuges.