

Using RF Safety Signs Properly

(MEDFIELD, Massachusetts) “Lighten up, David, it’s just a sign!” I get looks that seem to say this when I talk about RF safety signs.



Hard to tell if it is people or the sign that is in more danger.

After all, many people feel, a safety sign is no different than a bumper sticker or a post it on your cubicle wall, isn't it? It's very different. As an employer and a producer of RF energy, your company has an obligation to provide for worker and public safety in a structured manner.

Hazard Communication

RF exposure fits in Occupational Safety and Health Administration (OSHA's) workplace hazard rubric just like any other risk. There is an expectation that a company will have a program to manage these hazards. There should be a written company policy; workers should be trained; and information should be presented in a uniform way.

The American National Standards Institute (ANSI) has a standard for hazard communication via signs. This provides a structured approach to signing a facility that is uniform across industries and hazards.

When you see an ANSI-compliant Danger sign, it should mean the same thing whether the hazard is RF, electrical, chemical, mechanical, or whatever. In ANSI parlance, the Danger sign goes at the specific point where there is an *imminent risk of serious injury or death*.

At RFSigns.com, we take this to heart. Our Danger sign is for those points in an RF facility where you could be killed by contact with or approaching an energized surface. The most obvious location is at the base of a series-fed AM tower. A person can become the path to ground for very nasty amounts of energy at the base of an AM tower. Similarly, exposed feed lines, tuning units

and RF relays can be dangerous in ANSI terms. They should have Danger signs, too.

Structure of an ANSI Sign

What makes an ANSI sign different than any old safety sign? It has several components: a **Signal Word**, a **Message Panel**, and a **Safety Symbol**.

Signal Words are placed in a corresponding color band across the top of the sign: Red-Danger, Orange-Warning, Yellow-Caution, Blue-Notice, and some others.

The **Message Panel** has three pieces of information, where applicable: 1) the nature of the hazard (e.g. high levels of RF energy), 2) the consequence of the hazard (e.g. shock or burns) and 3) means to avoid injury (e.g. stay away, shut off power).

The **Safety Symbol** is any standard symbol used to illustrate a hazard. We tend to deal with two— RF energy, which we tend to associate with thermal exposure; and electrocution, which we associate with contact current, shocks or burns.

The Envelope Method

I have created a concept I call *Maxson's Envelope Method*. If you think of your facility as containing layers of spaces progressing from the most hazardous (the innermost envelope) to the least (outermost envelope) you can determine how to sign it.

AM towers make good examples. If there is a risk of electrocution at the base, mark it with Danger. Same for points of contact in the tuning unit or doghouse.



If the danger is a point or a marked off area, then a Warning sign should go on the envelope that surrounds that area. ANSI says Warning indicates a Danger is inside. Rather than a risk of imminent serious injury or death (Danger), Warning simply indicates there is a risk of serious injury or death within the envelope. So post

Warning signs on your AM tower fence and the outside of your ATU or doghouse, if there is Danger inside.

When “Caution” Applies

What about non-lethal hazards?

An FM or TV tower site may not present an opportunity for acute serious or lethal injury. Or there may be locations at an AM site that are off limits to the public or workers, without risk of serious injury. Here we go to the Caution sign.

ANSI says Caution is for risk of minor injury. But what constitutes such a risk?

The way I interpret it is that there is no official point at which you are slightly injured by RF. However there are the familiar regulatory thresholds that the government says you should not cross—general public/uncontrolled exposure limits and occupational/controlled exposure limits.

Do you get injured crossing into non-compliant RF exposure fields? Usually not. But since you have to keep the public away from certain power densities and you have to keep workers away from certain higher power densities, it makes sense that these boundaries be respected with Caution signs.

Envelopes

So at, say, an FM transmitter site, there may be a place where the public should stay away. If so, mark the envelope (fence, door, what have you) with a public safety Caution sign.



If inside that envelope, if there is an area that exceeds or can exceed occupational exposure limits, create an envelope for that area and mark it with an occupational Caution sign.

Since this is an occupational threshold for trained personnel, it does not have to be a *positive envelope* such as a locked fence, door, or cage. It can be a *passive envelope* that consists of a rope or floor markings, and the Caution sign.

In some cases, it may be sufficient to post a Notice sign, which is informational and is not announcing a specific hazardous location, say on the door of the shack.

If routine or emergency repairs at a transmitter site could produce a temporary hazardous condition, such as an open live cabinet being serviced, or exposed conductors, then it is wise to identify a positive envelope inside which general public cannot go without an escort, whether it be a transmitter room or the entire shack.

Mark that envelope with a public Caution sign.

Enhanced Safety Zones

Just to be sure, Caution, Warning or Danger areas that are temporary in nature could be permanently marked. For instance, even if your cabinet is interlocked, stick a Warning on the outside and a Danger on the inside in anticipation of a failed interlock or bleeder resistor, or of servicing conditions that expose normally secured spaces.

It generally makes sense to mark a tower for occupational exposure (Caution) at the climbing point, because the worker is notified in advance that there are exposure issues to prepare for by consulting the site policy and/or site manager/attendant.

However, it can also be helpful on a busy tower to mark the points at which the Occupational envelope actually is located. This way, workers who may have specific systems with which they work on the tower will be informed in place where they should not go without exposure control.

Sign Size

What about sign size? ANSI has a spec for letter size. With 1-inch message lettering it is assumed to be visible at 300 inches (25 feet). The Signal Word must be 2 inches high to be officially visible at that distance.

Simplistically, a 50-foot length of fence ought to be satisfied with a single sign with these lettering sizes

David Maxson
RFSigns.com
Mar 16, 2005