



GIS is the Perfect Safety Net

We have all heard the term safety net. The term comes to us from the circus. Without the actual roped safety nets, sweaty palms or small distractions mean instant death for the trapeze artists. But with the net, the theory is that they fall harmlessly and land with only a fright. Trapeze artists never want to fall on to the nets. Why? First, it's bad for their reputation. More importantly, they know that rats liked to chew on the nets. The nets all have holes. Adding an additional safety net might help, provided the holes don't line up.

Today the term has broad meaning. It's a system, a policy, a program, or device used to protect its owners just in case something bad happens.

When I worked for a power company, a seasoned nuclear-plant manager told me every safety net has a hole, a flaw just like in the circus. The nuclear-power industry has procedures, training programs, meticulous documentation, and practices to avoid mistakes at all costs. These are its safety nets. Yet as with circus nets, every single safety net has a hole.

It is the manager's job to recognize where the holes are and what to do to plug them. Failing that, the manager must add another safety net. Of course, no matter how many safety nets are put in place, they all have holes. The trick of risk mitigation is to understand where each of the holes are in each of the safety nets and prevent them from lining up at the same time, so no one can fall through completely. No one can promise to eliminate accidents entirely, but the more safety nets a utility puts in place and the smaller their holes, the lower the probability that the holes will all line up. The accident at the Fukushima Nuclear Plant in Japan is an example of all the holes lining up perfectly. The alignment of holes in all the safety nets is the "perfect storm."

One of the benefits of GIS for utilities is the improvement it offers in safety – for employees and customers. Not many people agree. They'll offer that access to reliable data is fine for other reasons, but not safety. Yet my argument is that if workers are unsure of where something is located, they might mistake one device for another and get hurt. Those who disagree with me say that utility workers would never work on a power line or gas main without first testing it, dead or empty, and then getting clearance from dispatchers. They are certainly right, to a point. No one would be crazy enough to rely solely on outdated or sketchy records in the face of life-threatening decisions, right?

I'll give you an example of something that happened several years ago. A cable worker was disconnecting a faulted cable from a switch cabinet. The worker was near the intersection of two busy streets. He had a paper map. The map clearly showed the location of the switch cabinet, along with its ID number. The worker had learned from a dispatcher that the cable had been de-energized. The worker found the switch and opened the cabinet door. Then he cut into the cable.

The flash knocked the worker several feet. It burned his face and hands. The cable faulted, which caused a substantial outage. Luckily, the worker survived.

The company recorded a lost-time injury. OSHA told the company to explain what happened and why. An expensive and time-consuming audit followed. The worker was out of work for many days.

What really happened?

First, the map was out of date. Months earlier, an engineer had issued a work order to move the switch to a different location. No one ever updated the map. So, the map had taken the worker to the wrong switch. Do we blame the old map for the accident? Do we blame the worker or the dispatcher? Do we blame the worker's supervisor for not having a fully trained staff? Who or what is to blame? The answer lay in a gray area. A lot of safety nets failed.

The first safety net was the rule to test each cable, dead or alive. The worker had ignored this rule—the first hole in the first safety net. The second safety net was protective gear. The worker wasn't wearing any. Regardless of how hot or how much he believed the cable to be dead, the gear must be worn. The third safety net was the dispatcher declaring the cable de-energized, based on an incorrect record of the location of the switch. If we had had a modern GIS platform using up to the second mobile technology, the worker would have never gone to the wrong location. In this case, there were a lot of holes in a lot of safety nets. Yet if the data about the switch was correct, the accident would not have happened.

Esri's ArcGIS is a location platform. Like social media platforms, it communicates in real time critical data about assets. In my example, even if the utility had corrected its GIS data, there is no guarantee that the dispatcher would have had access to the current data. Even today, many dispatchers operate from paper maps or printouts of GIS maps. Utilities can upgrade systems to assure that all parties operate from the same information base—whether on a GIS desktop, the web, or a mobile device such as a phone or tablet computer. GIS in the cloud, distributed to all parties, can help.

Every safety net has a hole. We can't eliminate them. But like the trapeze artist, we understand that holes do exist, and we must be ever diligent. GIS provides an essential safety net.

For more information on how ArcGIS can provide immediate access to your data, go to <https://solutions.arcgis.com/#Electric>