The Deadly Backlog – A Whole in the Safety Net

We have all heard the term safety net. It's a system, a policy, a program, or device used to offer protection to its owners just in case something bad happens. For example, people often refer to social security as a safety net for older people who don't have a pension. The term comes from the circus where large roped nets are set up below trapeze artists. Should a trapeze artist make a mistake, they would fall harmlessly into the net. Without the net, sweaty palms or small distractions could mean instant death. However, most trapeze artists never want to fall into the net. First of all, falling is a sign of failure of their craft. Second, they didn't trust the integrity of the net as circuses have notoriously bad maintenance. The trapeze artist knows that most safety nets have flaws. Some even have holes.

When I worked for a power company, one seasoned manager of the nuclear plant told me that every safety net has a hole. The nuclear power industry has procedures, training programs, meticulous documentation, and practices to avoid mistakes at all costs. Yet every single program or system could fail. It was the manager's job to recognize where the holes were located and to do what he could 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 had holes. Bad things happen when all the holes in the all the safety nets line up perfectly. The trick of risk mitigation is to understand each of the holes in each of the safety nets. Although it is probably not possible to entirely eliminate accidents, the more safety nets a utility puts in place and the smaller the holes, the lower the probability that the holes will all line up. The recent accident at the Fukushima Nuclear Plant in Japan is an example of how the holes in each of the safety nets lined up perfectly. We call this alignment of holes in all the safety nets the "perfect storm."

I believe that one of the benefits of a utility GIS is the improvement in safety for employees and customers. Not many people agree. My argument is that if workers are unsure of where something is located, they might mistake one device for another and perhaps 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 getting clearance from the dispatchers. Many argue that having good data is fine for other reasons, but it doesn't improve safety. My detractors 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?

No. But, good up-to-date data and specifically a good GIS is one of the safety nets.

I'll give you an example of something that happened several years ago. A line worker had to disconnect a faulted cable from a switch cabinet near the intersection of two busy streets. A printout of the GIS map clearly showed the location and identification number of the switch cabinet. The dispatcher had informed the worker that the cable in question had been de-energized. The worker found the switch, opened the cabinet door, and cut into the cable. The flash knocked the worker several feet, and burned his face and hands. The cable faulted causing a substantial outage. Luckily, the worker survived. The company recorded a lost-time injury. OSHA told the company to explain why this accident happened. An expensive and time-consuming audit followed. The worker was out of work for many days.

What really happened? First, the map was not exactly wrong. It was simply out of date. Months ago, someone in engineering issued a work order to move the switch to a different location. The worker was at the wrong switch. The as-built construction records ended up in a pile of completed work orders just waiting for someone to update the GIS. Do we blame the GIS 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 first safety net in this example is the rule that says no one is allowed to work on a cable, dead or alive, without testing. The worker ignored the rule—the first hole in the safety net. Maybe the worker was out sick the day of the safety training class. He fell through the first hole. Every worker is supposed to wear protective gear. This rule is another safety net. Why put on hot and uncomfortable gear, when he knew the cable was dead? The worker failed to put on his safety gear—the second hole in the safety net. These two holes lined up. The third rule says no work is to be done unless the dispatcher gives the order and declares the cable de-energized. This additional hole in the safety net was caused by an incorrect record of the location of the switch. If the GIS was right and everything else was wrong, nothing bad would have happened even though the worker violated two safety rules. Of course, this careless worker was an accident waiting to happen.

GIS alone doesn't improve safety, but it is an essential safety net. Incorrect or inconsistent information causes confusion and uncertainty. Using GIS, there are several safety nets utilities can put in place to protect workers. First, they can invest in the reduction of the deadly backlog of un-posted transactions and corrections to core data. Next, they can implement systems that shorten the time span between when a change in the system occurs and when the GIS gets updated. Mobile GIS can help here. Utilities can use mobile technology to implement systems that facilitate sharing and collaboration of data. 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 here.

Every safety net has a hole. We can't completely eliminate these holes. But like the trapeze artist, we understand that holes do exist and we must be ever diligent. The larger the stack of un-posted data, the larger the hole in the company's safety program—the safety net.

Get rid of the deadly backlog. Put processes and technology in place to assure that the hole in the safety net is as small as possible. Use executive dashboards, GIS functionality, and up-to-date data to protect workers, knowing that with all the procedures and programs in place, people will still do unpredictable things.