

Safety Circuitry: The Power in the Brain

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“What was he thinking?!” This frustrated question of supervisors, managers and safety professionals speaks directly to the future of safety in utilities. What are workers thinking when performing unsafe acts or walking past hazards, if indeed they are thinking at all?

For companies to realize their goal of zero incidents, an understanding of thought, attention, motivation and decision-making is a must. They must now enter the realm inhabited by psychologists for decades, the world of the human brain.

It has been said that while we are all born with a brain, no one gets an instruction manual. Herein lies the problem for lineworkers, leading hands and CEOs – without knowledge of the human brain and its limitations, it is likely to remain the No. 1 cause of workplace injury, and the brain’s potential for saving thousands of lives a year will go unused. The human brain is the epicenter of consequential thinking, planning, problem-solving and communicating, fundamental tasks for remaining free of incidents and injuries.

Without a good understanding of its design and function, workers are at risk of underusing the brain’s potential to keep them protected from harm, and also at risk for underestimating the critical importance of safe work practices to protect them from themselves.

(Not-So-Safe) Circuitry

The brain is certainly an impressive organ. This 2-pound mass of cells is responsible for placing humans at the top of the food chain, despite significant physical impediments, and is accountable for wonders in art, technology, industry and science. Yet the human brain is still fairly simple in its design; a design built for our ancient ancestors living and surviving in simple environments, with the basics of survival as their chief safety concerns.

The human brain has evolved somewhat from those very early days of feast, famine and ferocious animals, but has not evolved as quickly as the world around us. With the industrial and technical revolutions of the past few hundred years, we find ourselves neurologically ill-equipped to safely navigate the modern world and its highly complex workplaces filled with the everyday safety challenges of electricity, working at heights, vehicles and other people.

One such dangerous limitation of the ancient brain is its restrictions on attention capacity; that is, it can only concentrate on one thing at a time. The myth of multitasking has been disproved time and again in psychological research (Gorlick, 2009; Rosen, 2008), yet drivers reach daily for their cell phones, adjust satellite navigation systems and update their social networking status while engaging in what has proven to be one of the deadliest pursuits of modern man – driving. While concentrating on one task at a time has its advantages for accuracy, it leaves us unable to process other information in our surroundings, a phenomenon known as “inattention blindness.”

Inattention blindness was the term first used by Ariën Mack and Irvin Rock (1998) to describe our inability to see unexpected events or objects in our environment when we are engaged in another task, even when the unexpected information is highly noticeable and directly in the line of vision. Even when concentrating on simple tasks, researchers conclude that we are functionally blind to unanticipated events in our surroundings (Simons & Chabris, 1999; Mack & Rock, 1998; Neisser, 1979).

The significance of this brain limitation may begin to answer the question haunting utility workers for decades – how well-trained, vigilant and experienced electrical workers can fail to notice the most obvious dangers in their work environment, and then claim not to have seen them when they are looking right at them. Indeed, it is the brain’s inattention blindness that has been called upon to explain real-life cases of train drivers hurtling into cars on railway crossings, submarine pilots surfacing under ships and airline pilots landing on other planes. In each case, the hazardous object or obstruction should have been easily noticed by an experienced operator, but was not because the brain was cognitively engaged in another task. In other words, we miss things because they occur outside our field of focus, even if within our field of vision.

The Power in the Brain

Most safe work practices including training, PPE, risk assessment tools, safety observations and job safety analyses are designed to assist and limit the impact of the human factor in high-risk work. The outcome of an incident analysis is frequently a demand to increase the quantity of risk assessments or introduce new training in an attempt to prevent future occurrences. However, these tools are frequently met with refusal, resistance or apathy by the workforce because of what Chabris and Simons (2010) refer to as the “illusion of attention,” the common but mistaken belief that we (and others) pay attention to more of the world around us than we actually do. Intuitively we believe that we see, hear and perceive all that is right in front of us, that if something unusual, dangerous or unexpected were to occur – like a vehicle moving into our lane – we would see it and take immediate action. But real-world data and research tell us this is not the case.

This faulty assumption can lead workers to take many more risks than they otherwise should and underuse the safety tools available to them, leading to complacency and noncompliance.

Organizations can do much more to keep workers safe, starting with providing education about the biology of safe work. Simply knowing that our brains are designed for a less complex, less distracting world and knowing that humans suffer inattention blindness despite good intentions, are often enough to change the way we approach the modern world. Once aware of the physical limits of their neural networks, workers are more likely to make better choices, pay more attention during critical tasks, invite a second set of eyes, invest more energy into hazard identification and limit the amount of multitasking they attempt to do at attention-critical times.

Giving workers an understanding of why the brain fails – and how start-of-shift meetings, refresher training, job observations, safety observations and the like can and should be designed with the brain in mind – is an excellent start on the road to more mature safety cultures. With a bit of understanding of how people actually function, we are likely to reduce the “blame and shame” outcome of violations and investigations, and get on to designing more effective practices for changing worker behavior. Finally, when we focus on the brain as the keystone to a zero incident workplace, we begin to harness one the most important pieces of PPE we are all equipped with and really get people thinking.