DEKRA
WHITE PAPER

How to Control Brain-Centered Hazards™ in Warehouses

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Serious injuries and fatalities (SIFs) can happen to even the most experienced workers who have demonstrated safe performance of the same routine task in a similar environment. Why? The answer to that question points directly to how the brain works. In order to prevent human error in these situations, we need to understand how the brain functions and how even small changes in the work environment can lead to human error that results in serious injury.

Consider this example.

Imagine you work in a 1 million square foot facility operating a powered industrial truck. Surrounding you are long aisles with racks on either side stacked with product six, sometimes eight, levels high. The product ranges from small parts to massive engines. Signs and arrows activate your travel path. Over 200 trucks operate around you simultaneously. You are given a rigorous pick schedule that is heavily reliant on you to quickly pick the product and then move onto the next.

One route you take is fairly routine. It weaves you up and down aisles and then spits you out to a major aisle with separating sets of racks. The main aisle comes to a "T" intersection with another aisle where corrugated product is stacked up on the floor. Diagonal from the intersection is a massive facility support beam with a bright yellow bumper around the base. For weeks product builds up around that support beam, shielding it from view. The boxes are now the edge of the aisleway and provides the visual that directs drivers where to travel.

One day the boxes are moved exposing the large support beam. After navigating the usual maze of aisles and picking product, you find yourself at the familiar intersection. You stop and look both ways, then accelerate to the far side of the aisle to move on toward the next pick location. As you accelerate, you directly hit into the support beam. The truck abruptly halts and the back end springs into the air. Product topples off the truck. Worse, you propel face first into the grating of the front windshield.

In real life, the operator escaped serious injury with only a few bumps and lacerations to the lower face. It is fairly certain the hard hat the operator wore protected their forehead and face.

Yet the incident could have been much worse.

You are probably thinking about what this operator did wrong to cause the incident. The million dollar question is how on earth could someone not see one of the many large support beams with a high visibility bumper?

Yet it happened.

It wasn't due to inexperience. The operator involved in this incident had over 10 years of experience. It wasn't due to lack of familiarity. This same operator successfully completed this route time and time again as well as other routes in the facility. And without incident for years.

So what happened? How does a veteran operator miss such an obvious hazard?

The Peril of Fast-Brain Functioning

The answer is in our brain. One part of our brain that supports information processing is the cerebrum. This handles our decision making, and conscious, analytical thinking. We call this the "slow brain," as it takes more time to activate behavior.

The other part of our brain is Paleo-mammalian and it activates reactive and habitual behavior. It is commonly referred to as the "fast brain." The fast brain is not ideal in industrial environments like warehouses where working the same task the same way can result in less-than-right-first-time performance where someone gets hurt. People do not choose which part of the brain, slow or fast, processes information – our brains choose for us.

The scenario above created a prime opportunity for the fast brain to go into action. The operator ran head-on into the support bream as the result of carrying out the task habitually, with limited conscious processing of updated information where a change in the environment went undetected.

In other words, the fast brain prevented him from becoming aware of the change in his environment and responding properly, which led to the injury.

How Visual Recognition Plays a Role

One other key factor leading to human error in this incident has to do with visual recognition.

The operator stated he did not see the support. While some may say there is no way you couldn't see the support beam, the operator is probably being honest.

That's because we see with our brain. The brain tells our eyes to search for information to process and activate behavior that best suits the situation. When our brain does not identify something that is significantly new or different, it seeks to apply similar behavior to a familiar situation.

In this case, the brain "saw" the product. It was still stacked up and on the other side of the aisle. The brain then activated the behavior of continuing to use the line of product as the guide to where to drive the cherry picker.

One part of our brain that supports information processing is the cerebrum. This handles our decision making, and conscious, analytical thinking. We call this the "slow brain," as it takes more time to activate behavior.

This is what is known as expectation bias. The operator expected the product was still where it was for the past several weeks because there no immediate detection of change that would prompt a more conscious look at this situation.

Controlling Brain-Centered Hazards

Fast-brain functioning and visual recognition are two examples of what we refer to as brain-centered hazards. These are hazards related to our neurological make-up and are responsible for human error.

Brain-centered hazards impact all people including good, experienced workers such as the operator in the incident described here. It is important to understand how these two hazards function and then design work environments and activities in a way that accounts for, and controls, them.

Reducing Human Error By Not Blaming the Human

Many organizations seek to fix the person after an incident where it is deemed human error was a contributing factor. In those cases, corrective actions such as re-training, disciplinary action or even job re-assignment only serve as a band-aid for issues that will ultimately rear their ugly head again unless layers of protection are added into the design of work and work-related activities.

But brain-centered hazards reside in all people. That's why it is important to proactively identify where these reside in your work tasks and activities as well as look in the rearview mirror and identify where human error contributed to past incidents.

Examples of layers of protection that can defend against human error include: (use the Brain-Centered Hazards™ model)

- Provide visual cues highlighting changes in the work environment – especially changes to aspects of the environment that have remained static over a prolonged period of time.
- Create a forum to discuss pre-job safety briefs for specific tasks as well as highlight known changes that may add or change exposure.
- Rotate routes and tasks to prompt more slow-brain functioning.
- Complete pre-task exposure assessments using a strategic method for identifying exposures.
- Use a technique called commentary drive to speak through proximal exposures during routine activities carried out by a lone worker. This helps prompt slow-brain functioning.
- Integrate into event learning processes and methods for identifying underlying factors that resulted in human error.

The way our brains are wired plays a key role in making work-related decisions that have significant implications when it comes to safety. Understanding brain-centered hazards is imperative for any organization that wants to reduce the potential for human error.

And minimizing human error is paramount for any organization that wants to reduce SIFs.

SEVEN BRAIN-CENTERED HAZARDS™

- **Fast Brain Functioning**
- **Visual Recognition**
- **Divided Attention**
- **Memory**
- **Social Think**
- **Fatigue**
- **Stress & Urgency**

Interested in learning more about how brain-centered hazards are impacting your organization? Connect with us:

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