

## New Perspectives on Accident/Incident Investigation

BY LARRY WILSON

Surprisingly enough, most people can't even count the number of close calls they've had that could have killed them.

**MOST ACCIDENT/INCIDENT** investigations tend to look at the injury or incident from an external perspective. In other words, somebody else investigates the incident or injury, instead of the person who was hurt doing the investigation himself. Obviously, in the case of a very serious injury or fatality, this makes perfect sense.

But in other cases where the person wasn't seriously injured, it is still much more common for someone else to investigate it. Why? Some obvious explanations come to mind: "We want it to be impartial, we want it to be fair, only highly trained and skilled individuals are competent" and so on.

However, if the purpose of doing the investigation is not to lay blame (at least, that's what everybody says) but only to prevent the same thing from happening again, why is it that the highly trained, skilled and competent people who investigate accidents—in some cases hundreds of accidents—don't do it for themselves when they get hurt?

For example, years ago I went to a seminar on accident/incident investigation put on by one of the safest companies in the world. The seminar instructor, who investigated many injuries and incidents in his career before he became a seminar leader, had a fresh gash the size of a nickel on the top of his head. Because he didn't have much hair, it was very noticeable.

At a coffee break, I asked him what happened. He said, "I know, I know it's so embarrassing... I was doing some wiring in my basement and I just stood up too quickly."

"What did you hit?" I asked.

"Just a wooden joist," he said.

"Was there a nail sticking out of it or a really sharp edge?" I asked.

"No," he said, "I just forgot where I was and stood up without even thinking about the lower ceiling."

"So, what are you going to do to prevent something like that from happening again?" I asked.

"I'll just have to be more careful," he said. "Try to pay more attention to where I am next time."

Ironically, "Tell the employee to be more careful and pay more attention next time" was not part of the seminar.

Even more ironic, at least in my opinion, are safety professionals and consultants who have never used the word "careless" on an accident/incident investigation, yet they have told their children hundreds of times to "be careful." They know that blaming the worker for being careless is useless. Yet, for the people they love the most, they've repeatedly said, "be careful."

I once asked a group of corporate safety directors at a

major forest products company if they knew how to do "root cause" accident investigation. As you can imagine, every one of them put up their hand.

"How many of you have taught it?" I asked. Again, almost everybody put up a hand. But then I asked, "How many of you have slammed a finger in a car door somewhere along the line?" About half of them put up their hands (which will happen with almost any group of people). "So, how many of you did a root cause accident investigation?" I asked. Not too surprisingly, no one put up a hand. "Why not?" I asked. One guy looked at me and said, "Why would I do that? It was just a stupid mistake."

With any luck at all, "Try not to make any more stupid mistakes" has not been one of his recommendations when he was investigating workplace injuries.

But seriously, why is it so much different when we're investigating injuries that happen to other people? Why do we give ourselves different recommendations than we give others? If we think the process is so valuable, why don't we do it for ourselves?

### For a Moment, Forget the Traditional Approach

Perhaps it's because we don't have the right model to work from. Perhaps it's because we're not listening to ourselves. Perhaps it's because we accepted the teachings of those gone by too literally. Or perhaps it's because we're not looking at accident/incident causation from as many perspectives as we should.

Let's go back to the very basic building blocks: In order to have an incident you must have some form of hazardous energy and something unplanned or unexpected has to happen. In order to have an injury, you must have some hazardous energy, something unplanned or unexpected has to happen, and this hazardous energy has to come in contact with a person or the person has to contact it.

The perspective or focus traditionally has been on the source of the hazardous energy and keeping that hazardous energy from contacting the person through engineering controls, rules, procedures and personal protective equipment. However, as everyone knows, there are limits to what you can achieve with these measures.

That is not to say that the efficiency of these safeguards should be understated or overlooked. Obviously, if you can eliminate the hazard you don't minimize the risk, you eliminate it.

But perhaps it would be more illuminating, at least in this day and age, to look at the source of something unexpected happening. Think about it—there are only three sources of unexpected: Either you do something unexpectedly, the other guy does something unexpectedly, or the equipment you're operating does something unexpectedly. It will be one of those three or a combination thereof—unless of course, it's an act of God.

This is where the problems come in when someone else does the investigation. It's impossible for the "external" investigator to know exactly what was going on, or not going on, in the person's head at the instant the injury occurred. So we have to rely on what the injured person tells us. Few people deliberately try to incriminate themselves, so they might not tell us they weren't thinking about what they were doing at that moment. If you accept what they say at face value, then it might—especially after dozens of investigations—distort your perspective on how people really do get hurt, especially in terms of short-term or acute injuries.

But you, as the injured person, know what was going on, or not going on, in your own head at that moment. Instead of thinking about how other people have been hurt, for the following exercise, just think about how you've been hurt.

### Building Your Personal Risk Pyramid

How many serious or major injuries have you experienced so far this lifetime? How many broken bones, torn ligaments, burns, etc., have you had? Most people between 30 and 50—have experienced between one and five major injuries, if they add them all up, including on the job, off the job, driving their cars and sports (excluding contact sports).

How about minor injuries—such as stitches, sprains and significant muscle strains? How many of those have you experienced? Again, most people between 30 and 50 have experienced between five and 10 of these types of injuries.

Here's where the fun begins. If you drop down one more level on the old risk pyramid, how many cuts, bruises and scrapes have you experienced so far this lifetime? The most common answer is "lots." But when you ask people (and I've asked only about 45,000 people these questions, so I'm not saying it's conclusive) if "lots" is hundreds or thousands and if they think about their first 20 years or if you get them to think of their own children they quickly conclude that "lots" is thousands (including many they can't even remember from early childhood).

And yet the most significant category of all is at the bottom of the pyramid. How many close calls have you experienced? How many times have you had to hit the brakes quickly to avoid hitting another car, truck or pedestrian? How many times have you had to jerk the steering wheel to avoid hitting another vehicle? How many times do you think you have almost fallen but managed to regain your balance without actually falling? Most people, myself included, can't even remember the number of times they've fallen, let alone "almost" fallen. What about all the times when the other guy had to hit the brake for you, or jerk the steering wheel really quickly to avoid hitting you?

Thus it is impossible for anyone to accurately count the number of close calls they've had in total. But surprisingly enough, most people can't even count the number of close calls they've had that could have killed them. This is especially true if you get them to think about the number of times they've fallen asleep or "almost" fallen asleep while driving. It's estimated that between 13% and 20% of all fatal car crashes are caused by people falling asleep at the wheel.

If you get people to look at their own personal risk pyramid it looks something like Figure 2 (on the following page), which means that most, if not all of us, have experienced more injuries and significant close calls than the number of injury/ incident investigations that we ever will do. And to a certain extent, it's more reliable data because we know what we were thinking about or not thinking about at those moments when we got hurt.

Now, after building your own personal risk pyramid, ask yourself, "What was the source of the unexpected?" in each of those injuries. You probably will find that for more than 90% of your own injuries, the unexpected thing that entered the equation wasn't the equipment or the other guy.

Which area is left? More than 90% of serious injuries have their root cause in the "self" area.

In other words, with the exception of a very small percentage of injuries, people hurt themselves. It's not the equipment or the other guy. We do something ourselves, unexpectedly, to cause the injury. And these percentages hold true, no matter whether you're on the job, off the job or driving your car.

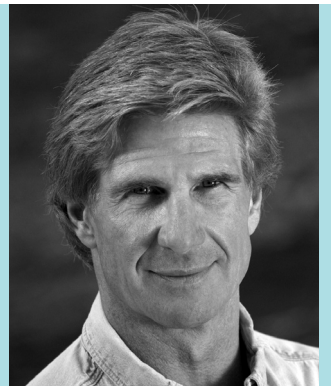
### Pay Attention to All the Factors

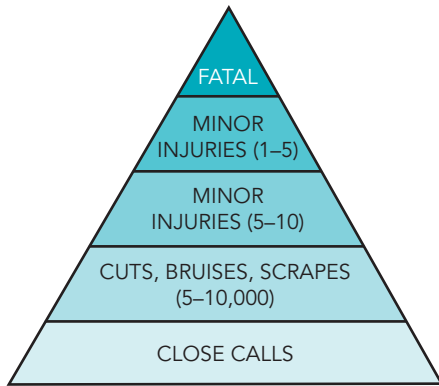
So, where does that leave us? Should we just tell other people the same things we tell our children? "You've got to be more careful." No. That is old methodology and it doesn't work. What we need to do is get them to realize how all of the factors involved in an incident or accident are important (not just what they told us in the investigation).

For instance, were you rushing or frustrated or overly tired? Had you become so complacent with the job, task or hazards that you weren't thinking of the risk at the exact moment you got hurt?

Did any of these states or human factors cause you to make a mistake or a critical error, such as eyes not on task, mind not on task, moving into or being in the line-of-fire, or somehow losing your balance, traction or grip?

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**Fig. 2:** The common personal risk pyramid.

More than 90% of all injuries anywhere—on the job, off the job, or on the road—are caused by these state-to-error risk patterns (see Figure 3).

Once you have explained the “mechanics” of how people get hurt, then it’s easy enough to explain what can be done and what they can do for themselves besides “try to be more careful.”

First of all, you can teach them to realize that when they’re rushing, frustrated, tired or complacent, they’ll be much more likely to make one of the four critical errors.

If they can recognize when they’re in a rush or frustrated or tired, and then think about eyes on task, mind on task, line-of-fire and balance, traction or grip, that’s usually enough to keep from making one of those errors. In other words, “self-trigger on the state before you make the error.”

### Putting Safer Behaviors in Place

So when you’re doing accident/incident investigations, see if you can get your employees to tell you what mental state they might have been in when the accidental injury occurred. If they were rushing, frustrated or tired, talk to them about the “self-triggering” technique. If they were complacent, see if they can work on their habits so that when their mind goes off task, they will have a safe behavior occurring automatically.

You might even want to let them know how valuable observing others for these state-to-error risk patterns can be. (Every time you do this, it automatically makes you more aware of your own safety and helps you fight the complacency factor creeping up on you.)

Finally, teach them to do this same analysis for themselves even when it’s a very minor bump, bruise, cut or scrape, or even when it was just a close call. That way, they can learn from all of their mishaps, not just the serious ones. After all, all of us have been hurt thousands of times. If we could just learn a bit from each one, instead of writing it off as “just another stupid mistake,” we all would be a lot better off.

But don’t just say, even to your kids, “Try to be more alert” or “Try to pay more attention next time,” or (get this) “Try to be more cognizant of your situational awareness next time.” You might as well say, “Try to be more careful.” Instead, teach them what they really need to do to prevent the next injury:

1. Trigger on the state so you don’t make the error.
2. Work on improving your habits.
3. Observe others for the state-to-error risk patterns that increase the risk of injury (Once you see them, you’ll see them everywhere.).
4. Analyze close calls and small errors. Learn from them, and you probably won’t have to agonize over the big ones. **MSC**

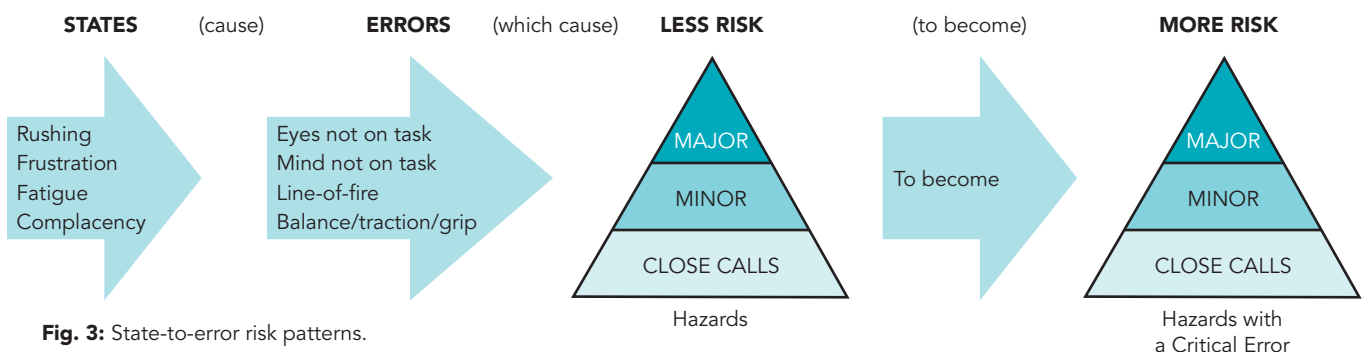
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### Learning From Experience

Since this article was originally published, thousands of work sites in more than 40 countries have trained their employees on these concepts and critical error reduction techniques to prevent injuries.

Because many safety professionals spend a lot of their time with accident/incident investigations, and for the most part their hearts are in the right place, they see no potential harm in enhancing their accident/incident investigations with these concepts. Going over the states and errors that may have been involved, and discussing what critical error reduction techniques might help to prevent similar injuries in the future, seem like movements in the right direction.

However, experience has shown the importance of covering basic concepts with employees first, before moving into self-evaluation mode. They must receive proper training before you can ask them to reflect on how to move their personal performance to a higher level of awareness.



**Fig. 3:** State-to-error risk patterns.