

# SAFESTART HUMAN FACTORS



## CONFERENCE

# 2022

Orlando, FL

November 8 & 9

## Take the Guesswork Out of Safety: How to Engineer Management Buy-in to Human Factors

---

Gary A. Higbee EMBA CSP  
CEO Higbee & Associates, Inc.  
Founder North American Management Institute  
Senior Consultant SafeStart - Retired

# WHY THIS TOPIC?

**The two most asked questions in my career!**

**1. Safety Professionals want to know why they do not get the support they need!**

**2. Management wants to know why their team thinks they do not support safety?**

**There is a leadership and Perception Gap!!!**

**Wrote an article on the topic that is available here today.**



# Significant Injuries & Fatalities

## How Are We Doing?

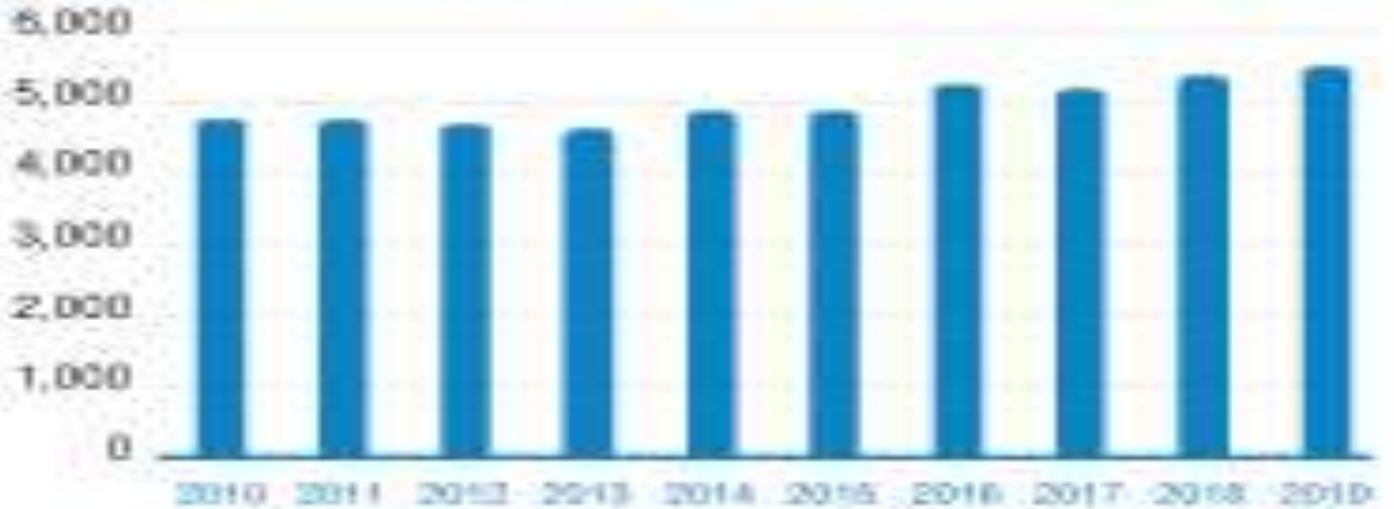
- Bureau of Labor Statistics published a news release December 16, 2020. In that release are numbers and data that should concern us all.
- If you look at the BLS chart **Number of fatal work injuries, 2010-19** we see steady increases in actual deaths.
- They also published a chart **Fatal Work Injury Rate, 2010-19**, That chart shows the rate hovering around 3.5. (Fatal work injury rate per 100,000 full time workers.)

### Key findings from the 2019 Census of Fatal Occupational Injuries:

1. The 5,333 fatal occupational injuries in 2019 represents the largest annual number since 2007.
2. A worker died every 99 minutes from a work-related injury in 2019.
3. Fatalities among workers age 55 and over increased 8 percent from 1,863 in 2018 to 2,005 in 2019, which is the largest number ever recorded for this age group.
4. Hispanic or Latino worker fatalities were up 13 percent to 1,088 in 2019—a series high since 1992. \

**Bureau of Labor Statistics published a news release December 16, 2020. In that release are numbers and data that should concern us all.**

**Chart 1. Number of fatal work injuries, 2010–19**



**Fatal work injury rate per 100,000 FTE workers**

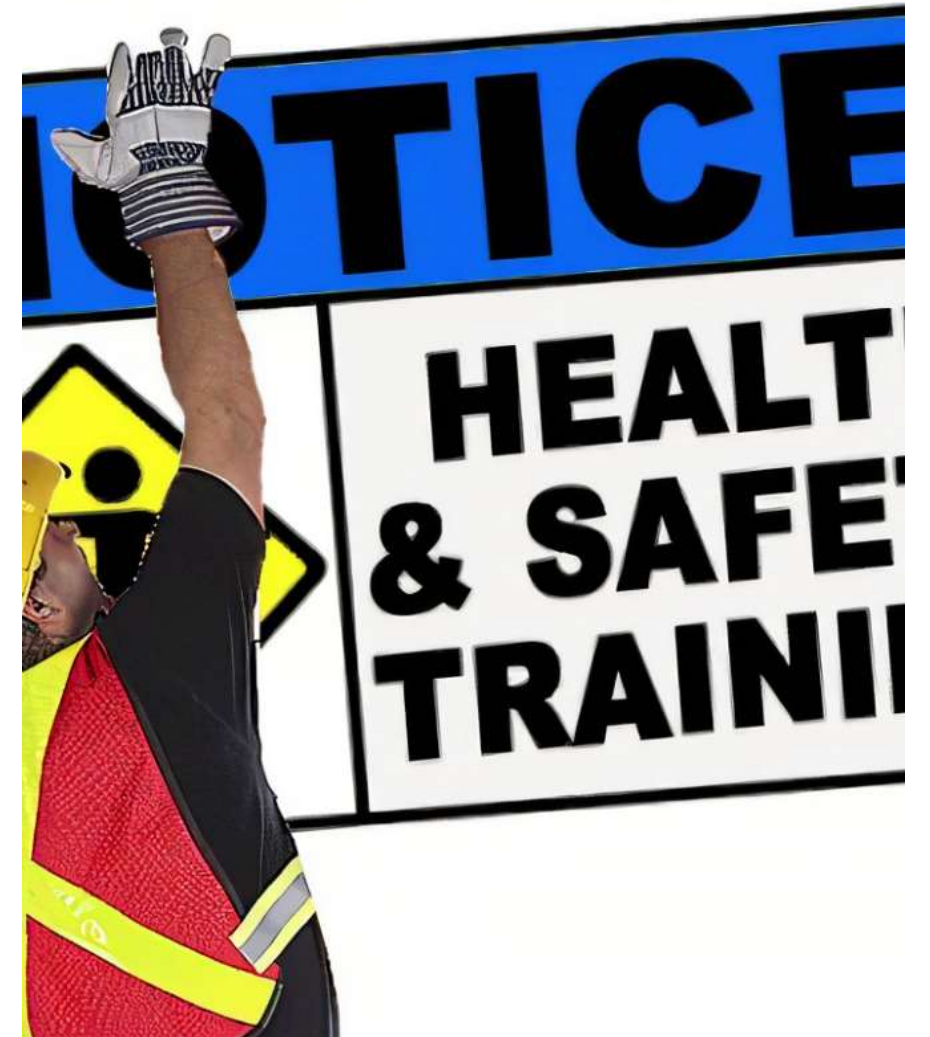
**Chart 2. Fatal work injury rate, 2010–19**



# Significant Injuries & Fatalities

## How Are We Doing?

- What do the numbers tell us beside the obvious lack of improvement?
- They tell us that despite all the advances we have made the result stays nearly the same or in some cases they deteriorate.



## Significant Injuries & Fatalities

### What Are We Doing?

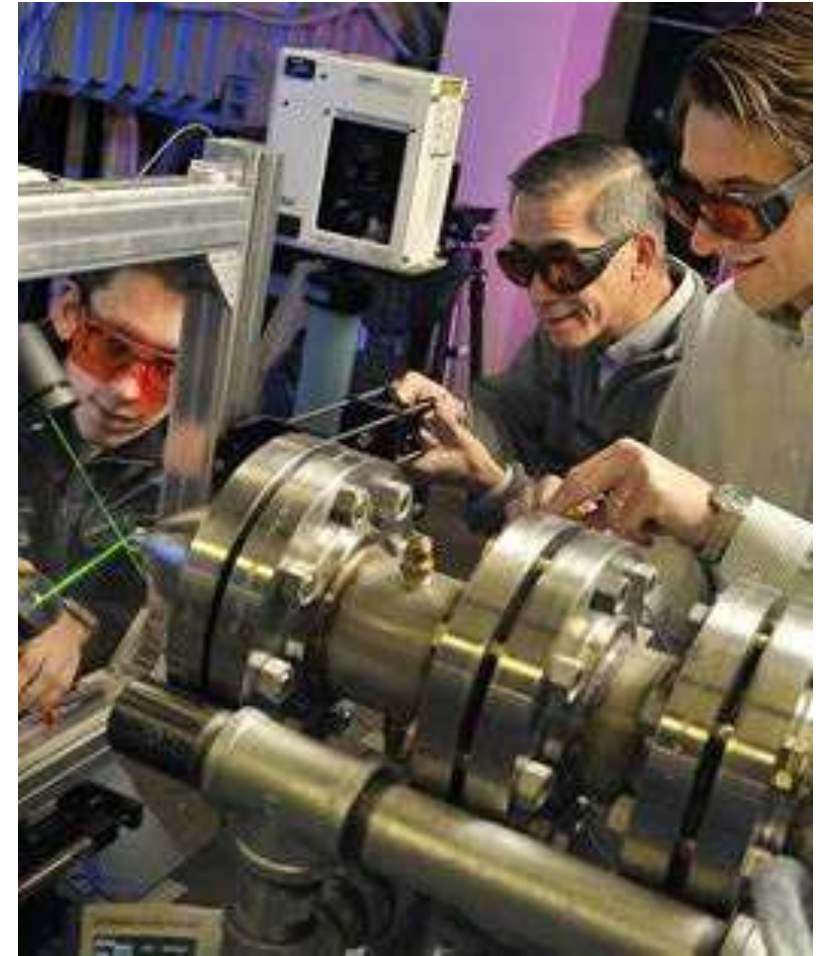
Just a few examples of positive efforts to reduce injuries that appear to have little to no impact on the data:



# Significant Injuries & Fatalities

## What Are We Doing?

- Exciting technology advances should be improving safety performance as well as productivity and quality.
- Engineering and job design to reduce risk based on formal risk assessments. Proactive rather than Reactive!
- Elimination of high-risk jobs and activities all together through elimination, redesign and substitution.



# Significant Injuries & Fatalities

## What Are We Doing?

- Rebirth of HOP to better assess risk and increase employee participation.
- Ergonomics, while not focused on high-risk tasks it should help in recognition of overall risk.
- Behavior Based Safety has been around for years, but the process has evolved and should be helping to produce better performance if the leading indicators are accurate.





# Significant Injuries & Fatalities

## What Are We Doing?

- Human Factors approach continues to evolve and has promise to move beyond simply analysis: Moving from what Happened to why “it” happened. Using more than just system analyses but also true human factors analysis beyond just human error to “why” human error.

WE SHOULD BE DOING BETTER – MUCH BETTER!



# Significant Injuries & Fatalities

## Where Are The SIFS Coming From?

- When you look at where the deaths and serious injuries happen there is not anything that says, **“this industry needs immediate attention”**
- So, if we are making all this effort and the data is not improving “doing more of the same isn’t going to reduce SIFS” and it is also not going to reduce the lessor injuries.



# Significant Injuries & Fatalities

## Leadership as it relates to SIFs

- What I want to talk about today is Safety leadership not just Senior Management Safety Leadership, Line Management Safety Leadership, Labor safety leadership I want to talk about ALL our safety management leadership and its impact on the safety performance of an organization.
- It is time for : “All Hands-On Deck”



# Significant Injuries & Fatalities

## My Hypothesis

- Current safety performance may not improve until we **help** executive, senior leadership, Line Management and Labor develop safety related knowledge and skills that translates into high levels of support and much **better decision making**.

# Significant Injuries & Fatalities

- Let's start by looking at current Safety Management Systems and then comparing those systems to executive and senior manager leadership skills and what we may be able to do to help senior leadership drive better safety performance and at the same time drive productivity and quality improvements.
- Primary duties of safety management is to assure regulatory compliance and keep the management team out of trouble. This is a harsh reality, but the evidence is all around us. If the leadership is unenlightened this is what they want. In reality, it is often what we tell them they want.

# Significant Injuries & Fatalities

- During my career one of my jobs was safety manager in a large manufacturing organization with several factories.
- My factory manager once told me “I do not want to be the best or the worst. I just want our safety performance near the top, say third or fourth among the factories, that way we get less attention”
- I couldn't have been more disappointed. No striving for excellence, no attempt at being number one, just keep us under the radar.
- I seriously considered resigning!

# Significant Injuries & Fatalities

- He had **very** little knowledge about general safety issues, safety requirements, limited data to guide him in decision making and a lack of knowledge about human performance issues led to his discomfort of the topic. **(There are no safety classes taught in engineering school or in MBA programs)**
- Yet, he was one of the best managers I ever worked for when it came to productivity, quality, systems, and performance.
- He simple did not know anything about safety so he wanted me to keep him out of trouble, which I did.

# Significant Injuries & Fatalities

- I decided that If this team was going to work effectively together, I had to help him understand the **need** for him to know more and do more in the safety arena. If he didn't get "it" I could quit later.
- Once he understood more about safety and how it impacted productivity as well as quality, he started to become more interested and more confident.
- I worked hard at providing him meaningful and reliable data often using formal Risk Assessments of specific tasks.
- He started to get "it" - Confidence and knowledge are a hard combination to beat.



# Significant Injuries & Fatalities

- The key for us to move beyond all the opportunities in Safety Management to actual results is going to be LEADERSHIP! Not just safety leadership but a comprehensive approach to business that treats all the factors of success equally.
- Not just management – all of us!

# Significant Injuries & Fatalities

- Let us explore some issues that illustrate just how **difficult** it is to treat all facets of leadership even close to the same.
- In addition, what can safety management provide to assure leadership feels confident they have the skills and data they need to drive safety performance not just accept current safety performance.

# Significant Injuries & Fatalities

■ The three areas that appear to be the most helpful to encouraging leadership involvement, skill development and confidence in the safety discipline are:

- **Data Reliability**
- **Risk Assessment**
- **Human Factors Engineering**

# ■ Significant Injuries & Fatalities

**Leaders and managers use data to make decisions!**

**All data is not equal nor as timely.**

# Significant Injuries & Fatalities

**Productivity Data** – This data is **instantaneous, perfectly visual, and easily understood.**

If you are scheduled to produce an automobile every 2 minutes one should be coming off the line every 2 minutes. If that production level is not being obtained everyone knows about it. The management, employees, and senior leadership all instantaneously know there is a problem.

The exact reason for the production variance may not be immediately visible, but the issue is. No communication issues, no secrets, immediate real time data.

Now it will not take long to find the reason. Walk up the production line and you will find the exact point in the line that is slowing down the production. Fix that issue and your back to normal.

# Significant Injuries & Fatalities

1. Productivity data is immediate available and accurate.
2. Leadership can rely on it.
3. They can quickly make perfectly accurate and effective decisions with this type of data.
4. Almost no decision risk!

# Significant Injuries & Fatalities

**Quality Data** – While quality data is not always immediate it does not take long to show up. Using the same example of the automobile assembly line the issue may show up as early as the next stage in the production line. Say a dent in the hood of the car.

1. It could be noticed right away, or it could get all the way to the dealer and must be repaired there.
2. It could even get to the consumer and must go back to the dealer for repair.
3. So, the discovery is not always immediate, but it come very quickly. Hopefully soon enough to avoid hundreds of cars arriving at dealers with the identical dents in the hood.

# Significant Injuries & Fatalities

- 1. Quality data is nearly immediate**
- 2. The data is reliable, you can see it.**
- 3. Management can make good decisions and limit the damage.**
- 4. Limited decision risk.**



# Significant Injuries & Fatalities

- **Safety Data** –The only time instant reliable data is available for safety is when we have had an incident. Then almost all the factors are available in real time, but it is too late.
- In the safety world we are trying to avoid having an incident and that requires us to rely on risk recognition, risk elimination, and risk prediction.
- This process is not as effective, but it beats waiting for an incident.

# Significant Injuries & Fatalities

- Leading indicators gathered via a Behavior Based Safety process can help but only if the data is accurate. If the leading indicators are wrong the organization spends time and money working on something that is not really an issue.
- The worse result is that we are not working on what we should be working on. The problem could be as simple as poorly trained observers. Unfortunately, it is going to take time to realize our data is not reliable.

# Significant Injuries & Fatalities

- When leadership uses bad data to determine its course of action, they make bad decisions sometimes unbelievably bad decision.
- So, for safety issues we need to be able to perform accurate risk assessments. In addition to the normal severity and likelihood approach to risk assessment that has been used for years we need to add to the risk assessment a third dimension, **Human Factors**.
- The adding of Human Factors is not easy, but you will recognize risk with an accuracy you never had before. Human factors do not change the severity it changes the likelihood.

# Significant Injuries & Fatalities

- So, to help leadership lead safety we must provide them reliable data in a timely manner. Not a report every month or every quarter of lagging indicator data.
- Leadership needs **leading Indicators**, frequent **Risk Assessment Reports and Hazard Rankings**. These tools allow us to predict risk of injury. Then decisions can be made that prevent the event or injury.

# Significant Injuries & Fatalities

- Safety data is not something they necessarily want to hear at first, but it is something they genuinely need to hear.
- Constantly and consistently providing accurate risk data will get the leadership in the habit of relying on the data, trusting the data and using the data to proactively manage safety activities not just reacting to safety issues.

## ■ Significant Injuries & Fatalities

**Executives can and often do make capital allocation decisions that can impact safety negatively.**

# Significant Injuries & Fatalities

## Productivity Capital Decisions

- These decisions are reasonably simple. How much does each increase of capital investment gain the organization in productivity? Then the decision is, do I need that much of an increase in productivity. (can we use the extra productivity, or do we have other constraints in the system making extra productivity of little value) Do we even have a market that can support additional productivity.
- Very little **decision risk** other than competitor reaction.

# Significant Injuries & Fatalities

## Quality Capital Decisions

- Quality capital decisions have their share of issues. The product must meet customer expectations (Neutral Position - if you cannot produce the customer's expected quality your next capital expenditure must, or you will not be in business long.) Now will the customer pay for quality beyond their expectation? Can you use higher quality to produce more sales and maintain profitability?
- Despite what looks like a complicated decision, making the right decision is still reasonably simple and void of **decision risk**.



# Significant Injuries & Fatalities

## Safety Capital Decisions

- These are the hardest decisions by far because the data is not as helpful as it is in the two other capital decision categories.
- You must use “Risk Data” to help make these decisions and that takes real leadership, risk assessment skills and time.

# Significant Injuries & Fatalities

**Example:** years ago, my organization produced a product that required frequent lifts between 35 and 45 pounds and the lifts were awkward.

We did a risk assessment using a state of the art (at that time) system. The risk rating was extremely high.

We presented the data to the operations manager proposing changes in the operation and even included data for productivity and quality gains.

His first and last question was “how many people have been hurt doing this job”? The answer was none, yet, but the risk is extremely high. The bad news is that we did not do that project until after four people were injured two requiring surgery. (Soft Data became Hard Data – no one will question that decision)

# Significant Injuries & Fatalities

- The issue is not how smart the decision maker is, the issue is what type of a leader they are and **is the risk data we provide considered reliable enough for them to act on it.**
- Risk data is often considered **soft data**, and, in this case, no one had been injured yet, so the data was “soft” and essentially ignored.
- **Hard data will always trump “soft” data.**
- Without enlightened leadership the capital will almost always go to the quality or productivity-based projects.
- These decisions damage the entire safety effort and without strong, confident leadership nothing changes.

# Significant Injuries & Fatalities

- The solution is including leadership in the risk evaluation process. Get them involved and share the way data is collected and evaluated.
- Most leaders like to have the data, but they want to be sure the data is reliable. This is hard to do because they view safety data as soft.
- Participating in one Risk Assessment activity will likely convince them that the process is valid, and the data can be relied on.
- We must report risk assessment results consistently.

# Significant Injuries & Fatalities

- Some good news, the operations manager I mentioned earlier did finally “get It” and risk assessment became a tool to lower risk on many jobs and tasks.
- Even productivity and quality risks! The process is similar.
- The risk assessments were so valuable we started performing them on new product lines in the development stages. Before implementation!
- It is up to us to help the leadership trust the data and use it effectively.

# Significant Injuries & Fatalities

## Human Factors Engineering

# Significant Injuries & Fatalities

## Human Factors Engineering

**“Human-factors engineering is a collection of data and principles about human characteristics, capabilities, and limitations in relation to machines, jobs, and environments. As a process, it refers to the design of machines, machine systems, work methods, and environments to take into account the safety, comfort, and productiveness of human users and operators.”**

# Significant Injuries & Fatalities

## Human Factors Engineering

- As a production engineer I designed systems thinking the actual work was done by consistently going from point A to point B efficiently.
- I assumed that that pattern was consistent and had very little, if any, variability.



# Significant Injuries & Fatalities

## Human Factors Engineering

- What I found out was all systems have variables, sometimes changing by the minute.
- What we thought was simple can become overly complex in the moment.
- Issues like parts not fitting together and requiring excess force, a machine not working efficiently on a consistent basis causing parts out of specification, employees not feeling well, being frustrated or overly fatigued causes performance variables. Work is just not that simple.
- So, it is not a straight line from A to B it is more like a wavy line with highs and lows.

# Significant Injuries & Fatalities

## Human Factors Engineering

- Our workforce knows about the variables and does a great job of producing a quality product very quickly, but do they do it safely?
- Traditional risk assessments are not accurate in a variable environment. So, if our effort to drive safety performance through the system does not include Human Factors we will continue to be frustrated by the variability of our results.

# Significant Injuries & Fatalities

## Human Factors Engineering

- Senior Management and leadership must understand basic human factors. They need to know that the way they manage can cause human performance variability. Increase risk!
- Twelve-hour days, six days a week can easily change acceptable risk into unacceptable risk, seriously altering the likelihood of an event because of fatigue.
- Including Human Factors with the severity potential and the likelihood in risk assessments will get them really thinking, particularly about how human factors alter the likelihood.

# Significant Injuries & Fatalities

## Human Factors Engineering

- Everyone knows going faster than normal, being frustrated, overly fatigued and being overconfident (complacent) can cause us to make errors. These errors are caused by “states” people move into and out of on a moment-by-moment basis. **The hard part is, only the employee knows what “state” they are in.** Human factors and their impact on performance can be difficult to manage but until we have a basic understanding of the human factors, we cannot make a positive difference in the injury data.

# Significant Injuries & Fatalities

## Human Factors Engineering

- In addition to the level of **hazardous energy** and the **likelihood** of moving into or coming in contact with hazardous energy **RISK ASSESSMENTS** need to include Human Factors!
- Human factors change the **LIKELYHOOD** not the energy level.
- **Crane Example!**

# Significant Injuries & Fatalities

**We Have Our Work Cut Out For Us!  
It isn't Impossible!**

**Gary A. Higbee EMBA CSP**

**[g.Higbee@mchsi.com](mailto:g.Higbee@mchsi.com)**

**[gary@safestart.com](mailto:gary@safestart.com)**

**586-604-3765**