vetergy

UNCOMMANDED RELEASES AND ENERGY ISOLATION

A CASE STUDY USING HUMAN FACTORS TO UNDERSTAND CULTURE, ITS LINK TO INCIDENTS, AND THEIR PREVENTION.

How Can We Prevent Disasters We Don't See Coming?

When analyzing your process safety incidents, it is vitally important to investigate deeply. **Look past the immediate errors,** asking why they made sense at the time.

Organizations that look for deep cultural and causal factors can expect to be rewarded with solutions spanning challenges much broader than the specific incident at hand. **Seemingly unrelated incidents often emerge from the very same cultural factors.** Investigations that only scratch the surface leave future disasters lurking quietly, only to erupt later.

The Human Factors Analysis and Classification System (HFACS) is a tool and methodology for deep investigations that lead to broad, proactive solutions. Deeper insights lead to broader solutions, which can head off lurking disasters before they happen.

Human Factors Taxonomy and Why It Matters

When we dig deeply into causal factors, we inevitably touch on matters of culture and leadership. Culture imposes a powerful influence on individuals' decisions and actions, but in practice, it is often glossed over during incident investigations.

Deeper insights lead to broader solutions.

A common reason for inadequate cultural insights is, even though managers usually sense culture is somehow a factor, they typically haven't been armed with the language for incisive explanations of cultural factors. **It's hard to be clear when you don't have the right words at your fingertips.**

One of the most important elements of a strong HFACS program is its taxonomy, a well-defined language for describing human factors.

A Client's Story

Picture this: A complex chemical manufacturing plant with several commodity products and some extremely dangerous ingredients in high volumes. This plant is one of a dozen similar plants, globally dispersed, comprising one division of an even larger organization.

They recently experienced a large, uncommanded release of inert gas. Since the gas was inert, it would have been easy, and not uncommon in the industry, for organizational leaders to expel a relieved "phew" and press on. Naturally, there would be a few immediate action items resulting from some sort of investigation. **The actions would be focused on the specifics of this particular incident, and typically would involve a procedure modification and/or disciplinary action.**

But in our client's case, they reacted very differently. First, they recognized that "uncommanded" mattered a lot more than "inert." And there was the added organizational wince in learning the release had gone unnoticed for over 24 hours. So "unnoticed" carried a lot of weight, as well.

Leadership seized the opportunity... to learn more about their own organization.

Second, the organization had been a Vetergy client for several months, and therefore had a robust HFACS program in place.

Recognizing that luck is not a strategy, this client's leadership seized the opportunity to bring HFACS to bear on the incident to learn more about their own organization.

The Story Behind the Story

A year earlier, the same plant experienced an uncommanded release of organic solvent. This incident happened before Vetergy's HFACS training, so they conducted an incident investigation using traditional Root Cause Analysis (RCA).

They found a technician had signed off on several steps during post-maintenance return-to-service work. The technician had not done the work himself, but instead understood, based on verbal (mis)communication, that his colleague had done the work. Furthermore, he did not visually confirm the work was done.

As it turned out, a valve was left open. When flow of the solvent was restarted, the result was an uncommanded discharge, discovered several hours later. The technician who signed off the work as complete was disciplined.

What Was He *Thinking?*

This incident was investigated and handled in a straightforward manner. Details aside, it's a familiar pattern, not only at this plant or even in chemical manufacturing, but widespread across most process industries and locations. This plant's leadership noticed the pattern and wondered, What was the technician thinking, and why do things like this keep happening?

They followed through on the thought and analyzed their data. They found that **80% of incidents were due to human factors.** The problem was they had no tools or methodologies to help them sort out the pattern of poor decision-making in any actionable way. Disciplinary actions for specific poor decisions don't fix the pattern.

Enter Vetergy. We delivered formal HFACS training, leaving this client with a strong HFACS program of their own. We consider our work successful once our clients have acquired HFACS as a self-perpetuating organizational competency.

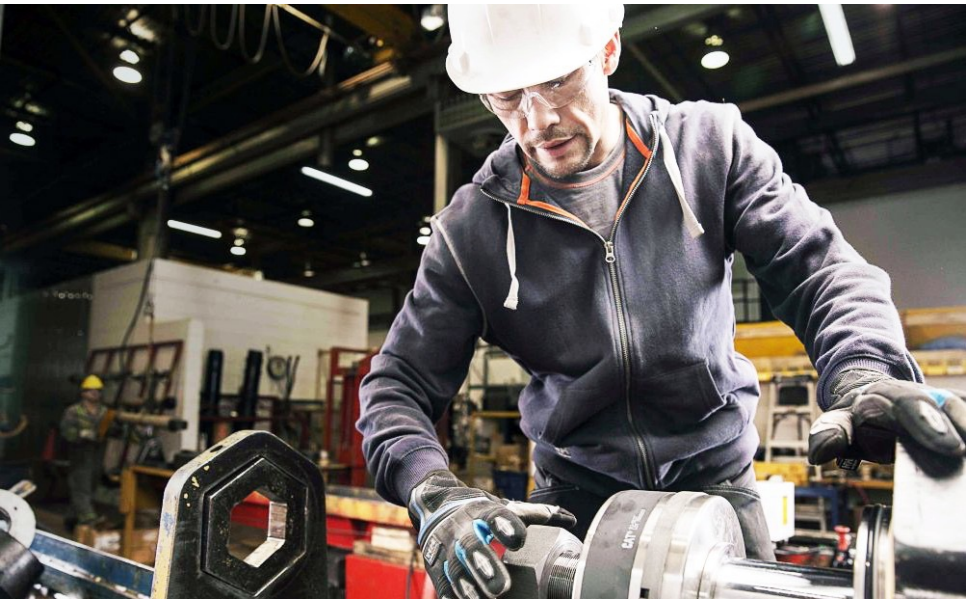
What *Was* He Thinking?

As the final step in our training, the client performs a re-investigation under observation. The client's team selects an incident from their files to investigate anew. Vetergy personnel observe and coach as the client's team works. In this case, the client selected the uncommanded organic solvent release.

Foundational to a strong human factors investigation is the notion that everyone involved, until proven otherwise, did what they felt was right at the time. So rather than asking with vexation, **What was he *thinking?***, we ask with curiosity, **What *was* he thinking?**

Very often we discover that, although people may know they are not doing things as written in the procedures, they are doing what makes sense at the time. Shared habit patterns, implied organizational priorities differing from espoused priorities, and a history of no negative consequences (yet) naturally reinforce bad habits. Eventually, statistics catch up, and the well-worn bad habits surface as glaringly poor decisions, sometimes with dire consequences. Only through disciplined curiosity can an organization uncover those hidden threats.

Uh, oh. We Blamed the Wrong Person



Upon re-investigation, several deep cultural issues were uncovered. The surface story—technician signed off on work he neither did nor confirmed—was not questioned. This time around, though, the team realized that, although their original explanation was true, it was not the whole truth. Furthermore, the rest of the truth is more instructive. Here are some of their deeper findings:

► A cultural value encouraging "can-do" team players led the technicians to drop what they were doing and respond immediately to the return-to-service work request. Sounds OK, but…There was no supervisory role with responsibility for prioritizing competing requests for work—in this case, the job the techs were on versus the job they were called away to do. It's not that the supervisor failed to prioritize; the supervisor wasn't expected to prioritize. As a result, a long-term high-priority task was put on hold in order to work on a short-term but lower-priority task. In other words, a strategic resource allocation decision (what should the techs work on first? was left up to people (the techs themselves) unarmed with the information or training to make a good strategic decision. At the same time, these de facto decision-makers were heavily influenced by a "can-do" culture. So they did what seemed right, which set them up for failure.

Co-workers trust one another... But in this case, there was a dangerous repercussion.

► Another important cultural value in this organization is trust. Co-workers trust one another implicitly, and for good reason. But in this case, there was a dangerous repercussion: Since directing a peer is seen as mistrusting the peer's competence, neither technician was understood to have the lead. One of the techs took the lead on paper by signing the procedure as complete (and therefore suffering the consequences of process failure), but during execution, neither operator was really in charge.

Furthermore, operators were routinely expected to sign off on work only verbally confirmed. In their minds, they weren't cutting corners; they were doing what everybody did as a matter of course. **As a result of deeply ingrained cultural factors, gaps in responsibility and execution were missed.**

- Somehow becoming disconnected from the realities of risk analysis, this organization's culture implicitly communicated the following message: post-maintenance return-to-service work does not carry the same weight of responsibility, or receive the same level of vigilance, as the pre-maintenance work of isolating the relevant portion of the plant. Oversight for return-to-service work was routinely underemphasized and underperformed. **Given the inevitability of human error, this was a setup for harm sooner or later.**

Noting that none of these cultural and leadership factors were the fault or responsibility of the technicians doing the work, the re-investigation team realized, "Uh, oh. We blamed the wrong person."

The organization's values... were the most important casual factors.

The organization's values...were the most important casual factors.

Wait…Positive Organizational Values Were a Factor in a Process Failure?

In fact, the very notion of blaming any person at all was off-target. The organization's values and ingrained habits were the most important causal factors in this incident.

Even more startling to many, the organizational values that played a part in the solvent release were positive values. We aren't always looking for negative values during an HFACS investigation; very often, we are looking for unintended consequences of positive values.

When we find those, we can bring awareness and nuance to the ongoing dialog that expresses an organization's culture and values.

Complexity and Leadership

By failing to embrace the complexity of human interactions and how they can lead to unforeseen organizational outcomes, leaders become the unwitting source of their own troubles.

Global Impact

Our client's leaders recognized troubling parallels between the previous solvent release and the more recent gas release: Both were uncommanded releases caused by undisciplined post-maintenance return-to-service work. Both went unnoticed for several hours. Clearly, there was more to be learned.

Their findings led to mandated changes across the entire division

They performed an HFACS investigation of the gas release, entirely without Vetergy's involvement. Their findings led to mandated changes across the entire division. In other words, the impact of their investigation was global.

Proof

The changes called for a higher level of supervisory involvement in planning for pre-maintenance isolation and post-maintenance return-to-service. Additionally, more redundancy is now required for sign-off.

At first glance, this fix sounds like more bureaucracy, and more bureaucracy doesn't always fix anything. But here's what happened: **less chaos and better efficiency.**

The real proof that their division-wide management changes have been effective: **frontline workers have embraced them as real improvements.**

Why Vetergy

"We never would have gotten there without HFACS," said one member of the senior management team.

HFACS is *the* methodology to uncover and prevent lurking disasters

HFACS is *the* methodology to use for uncovering and preventing your organization's lurking disasters. Vetergy's HFACS training grew out of our experience as naval aviators. Aircraft carrier operations are often showcased as an iconic example of complex organizations with high performance and high safety in the face of very high risk. One of the keys to high reliability is our insistence on **deep and unflinching investigations into our organizational failures, particularly the small ones.**

In Vetergy's effort to deliver the very best training to our clients, we use the proven combination of theoretical explanation, real-world demonstration, and observational coaching. The trainees' experiences then become "hear one, see one, do one." Our clients find this to be a highly effective way to transfer sustainable expertise.

For more insights, visit us at www.vetergy.com, or send us an email at info@vetergy.com.

THE VETERGY GROUP
Discover. Lead. Transform.

1200 Corporate Drive, Suite 170, Birmingham, Alabama 35242