What's Your Story?
Understanding Work Cultures by Listening to Their Stories

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Introduction

Strong cultures like those found in the military or "high-risk" industries like mining or oil and gas extraction can be very resistant to change, particularly if members perceive they have no choice in how that change is implemented. For a safety professional trying to convince workers to take responsibility for their own safety, it is imperative that occupational cultures be understood, and even brought into the safety plan, because of the incredible power cultures have over how members view their work and behave on the job. The stories shared among members on and off the job site are a key part of how culture is reinforced among occupational insiders, how new members are brought in and educated on what is expected by their peers, and how those inside the culture decide what is important. This presentation will provide a detailed discussion of the author's research and experiences in working with high risk industries to create *effective* training, information on work cultures and why they are important, and lessons learned in working inside occupational cultures to develop training that works.

Background

Stories have been around as long as there have been people to tell them and others to listen to them. Many people consider stories to be purely for entertainment, but stories have other roles, particularly in work cultures. How I came to understand this is a story itself.

   I have spent my career working in and for "high risk" industries, particularly mining and oil and gas extraction, with a short time spent in commercial deep-sea fishing. These industries share many commonalities, including a workforce that tends to be predominantly male, workers that are risk-tolerant (and some might claim, risk-seeking), and work that is considered by "outsiders" to be hazardous. There are, of course, other industries that fit this mold, including construction, fire-fighting and police work, the military, cell tower construction, logging, and a host of others. People who are attracted to these occupations are looking for the higher pay that industries such as these must offer those willing to take on the risks, but they are also looking for the adventures these jobs offer. Workers share a strong sense of being different from employees in safer industries, as well as a camaraderie that isn't as strong in fields that don't involve putting your life on the line. Being part of a team is a key benefit in these fields, and those who do not fit in or understand that you take care of your buddies will not last.

Nearly 40 years ago, I began my journey in occupational safety as a young engineering technician for the U.S. Bureau of Mines. I was initially assigned to a new, long term project entitled "Single Entries for

Longwall Development in Underground Coal," which was based in a large, deep underground coal mine in northeastern Utah. Although women were not allowed to work underground anywhere in the country at that time, I was given the opportunity to participate in the field work as part of the team involved in the 11-year study and thus became, as far as we knew, the first woman in the country to work in a large commercial coal mine (another story in itself).

Underground was a new world for me, one that was far different from what I expected it to be. Just getting to the work area, known as the face, was an adventure. We were winched down a long incline in man cars, and caught a train that took us several miles into the mine to a junction, where we then walked about 3/4 of a mile to where we were working. As the miners waited for the trains to take them into or out of the mine, they entertained each other with stories. I had no experience to relate these to, and didn't understand many of the words that they used to describe the mine or what people did in their work, but I enjoyed the stories even so. And most importantly, so did they. I did not suspect at that time how important stories were, or that they would become the strongest tool available to me when I began to study effective training many years later.

In 1996 the U.S. Bureau of Mines was closed by Congress and the laboratory where I worked in Spokane, WA, was transferred into NIOSH, the National Institute for Occupational Health. The focus in NIOSH was on miners, not necessarily the mine, and once again, I was given an opportunity to try something new. A small pilot project was funded by NIOSH, which was titled "Developing Effective Safety Training for Miners." While I had no experience in developing training, I had taken a great deal of it, since my colleagues and I were all required to take the same training that every miner in the country was required to take. I had some very definite ideas about what training should look like, and remembered very clearly those stories that I had heard over the years. They were a lot more interesting to me than the typical training was, and I was determined to use them, believing that the miners would pay attention to them and that they could be used to teach about safety.

I have been fortunate in my career to have visited mines in all parts of the country, including surface and underground, coal and metal/nonmetal, sand and gravel, and in-situ leaching operations. Although there are certainly differences among these mines, due to geology, geography, and mining method, the miners themselves were remarkably similar. They may have been ethnically diverse, geographically bounded, and representative of different generations, but the mining culture seemed to be a constant no matter where I went.

A Short Discussion about Occupational Culture

We are all members of many cultures. We may belong to a church, a fraternal or service organization, a sports team, or even a family with ties to a distinct nationality. All of these groups have expectations about what members do, how they should behave, who is allowed in and who is not, and "insider language" and traditions that are known to members but not to outsiders. All of these things are tools used to define a distinct community, and to control the actions of members. That is what culture does…it is "a social roadmap for its members, providing essential information on how to survive and be successful within its boundaries" (Cullen, 2008). Patton (2002) defines culture as "that collection of behavior patterns and beliefs that constitutes:

- Standards for deciding what is;
- Standards for deciding how one feels about it;

- Standards for deciding what to do about it;
- Standards for deciding how to go about doing it" (p. 81).

Occupations also have strong cultures, particularly those where members are expected to perform tasks that are inherently dangerous, such as the military, or where the workers are geographically isolated from other workers. That, in essence, is what Boot Camp is all about. Not only do new recruits get training on how to handle weapons and make war, they are isolated from outside influences and thoroughly indoctrinated on what it means to be a Marine, a Navy Seaman or a member of any of the other branch of the Armed Forces. And if bumper stickers that are visible on pickup trucks anywhere in the country are any indication, people define themselves as a member of their particular branch of the armed forces long after they have mustered out. The value of this, of course, is that there is a sense of unity and belonging, as well as a shorthand that is known to anyone who has gone through the same Boot Camp. Any ex-Marine who sees "*Semper Fi*" on a passing car knows that here is a comrade, someone who has a shared experience and shared language. There is an instantaneous connection that can be made, short circuiting all of the normal "bonding rituals."

Occupational cultures provide much more than a sense of belonging to their members. Strong cultures (I use this term to describe cultures where inherent dangers create a shared belief among members that only by standing together can anyone survive) do provide that roadmap common to any culture, but for work cultures that include risk, they could also be the key to survival. Mining, for example, is a world that is mysterious to those who have never been underground. For new hires, it is bewildering to face not only work tasks and tools that are unfamiliar, but also an environment that is innately hostile, and described by other miners with words that are foreign to them. Inexperienced miners must come up to speed quickly in order to work safely, and to avoid putting others at risk by doing something that is considered unsafe. Fortunately, cultural norms in these types of industries insure that newbies are paired with experienced hands, people who can teach them the work tasks as well as the norms and expectations of the culture, and also keep an eye on them to prevent them from doing something to put themselves or others in undue danger. Almost all of these types of industries use journeymen workers as mentors, for they understand that one does not learn the necessary skills in a classroom, but rather by doing the work under the guidance of someone who does it well. Billet says that journeymen workers teach three essential things to new hires:

- Knowledge about what is important
- Knowledge about how to do things right
- Knowledge about the culture, including the values and attitudes expected if one is to take one's place in the occupational culture (Billett, 1994).

If occupational cultures are the gatekeepers that provide members guidelines on how to be successful, they are also the primary key to successfully changing work behaviors. This is the goal of effective training. Strong work cultures can be very resistant to outside suggestions, such as those made by a safety professional who is not considered part of the culture. (As a woman working in traditionally male dominated fields who was also a government employee, I was definitely not considered an insider, and had no credibility at all with these workers when I first began my career.) If these changes are recommended by trusted insiders, however, they have a much higher likelihood of being adopted. Van Maanen and Barley (1984) believe that occupational communities use rituals, behavioral norms, work

codes, and stories to reinforce the values and standards that are expected, and that these tools are very effective in transmitting information from one generation of workers to another.

So why should a safety person pay attention to occupational cultures? Because it is quite simply impossible to change workers' behaviors if their culture is ignored. Schein, a noted social researcher, admitted that early on, occupational cultures <u>were</u> ignored and that because of it, researchers failed in their attempts to change common work practices. He admitted that "culture, viewed as such taken-for-granted, shared, tacit ways of perceiving, thinking and reacting, was one of the most powerful and stable forces operating" (1996, p. 232). With such a powerful tool available, why would anyone fail to use it?

There is one other aspect of cultures that should be mentioned. All cultures, whether they are religious, occupational, ethnic, familial or other, create and use insider language, which can be referred to as "tribal language." Tribal language is often a shorthand that includes jargon used to describe situations or environments. It is extremely effective if used properly, and can be a major barrier if ignored or misused. Jargon communicates what is important as well as members' perceptions of that information. One of its most powerful attributes, however, is that it excludes nonmembers, who don't understand either the words or the meaning. For work cultures that consider themselves to be unique, tribal language is a very potent tool. Creating training materials in highly technical or bureaucratic language not commonly used by workers greatly increases the likelihood that these materials will be ignored, while lessons taught by trusted insiders using occupational jargon are much more credible and will not be ignored.

Some Research about Stories

One of the earliest memories I have of my new career in the mining industry is of sitting and listening to stories told by miners. At the time, I did not understand their value outside of the fact that they were quite entertaining. Subsequent research has shown that stories are an incredibly influential tool used by cultures to teach what is important. Not the least of their power comes from the fact that people are eager for stories. We are much more likely to listen to stories than to bare facts (although there is ample research to suggest that we tend to believe facts more readily). It would be a mistake to equate facts with "truth," however. Humans are "meaning makers." We look at data and create meaning from it, and we almost always do this communally. Learning, according to Lave and Wenger (1991), happens in an environment that is socially interactive. Bruner agrees with this, stating that meaning is always created within the confines of a culture and that "Human beings…are expressions of a culture. To treat the world as an indifferent flow of information to be processed by individuals each on his or her own terms is to lose sight of how individuals are formed and how they function" (1990, p. 12). Stories are what we humans use to connect to others and to learn what is important and how we should react. If we listen to the experiences of others, we do not need to repeat those experiences in order to learn the lessons. Powerful indeed for a safety trainer.

Any training program or lesson must have, as a primary goal, the intention to change the beliefs and behavior of the trainees. This may mean teaching new skills in order to perform more productively, or communicating about risks that must be avoided in order to work safely. Perhaps the first task of a trainer is to get the attention of the trainees. Failing this, the trainer can never make a difference. If a trainer is trying to develop skills among new hires, the task becomes more difficult, because not only must the

tools, tasks, and hazards be communicated effectively, the environment, the culture, and the language must also be conveyed. Training will never be effective if the trainer cannot connect to the learners and provide them with lessons that are perceived by them to be valuable. Stories can be used to do this. They take facts and make them interesting, and even more importantly, they help trainees make meaning of what can be a bewildering amount of new information. Training seeks to take relevant information and turn it into useful knowledge of the task or occupation, so that the learner eventually comes to understand when and why to apply that knowledge. Roger Schank sums it up nicely: "Stories form the framework and structure through which humans sort, understand, relate, and file experience into memory" (Haven, 2007, p. 10). Henry Cole, a researcher from University of Kentucky, says, "Storytelling is not the only successful cognitive process or organizing perception, thought, memory, and action, but…it is more effective than any other (1997, p. 331).

So what does the research have to say about <u>why</u> stories are such powerful tools? Changing the voluntary behavior of adults is not an easy task, particularly if the training provided by a safety person is mandatory. Workers can be resentful of being required to sit in training sessions, particularly if they are experienced and believe that they have mastered the art of doing their work. (Changing the bad habits of experienced workers can be one of the biggest challenges for a safety professional. It can be done, but that, again, is a different story.) There is a wealth of studies that have been conducted on why stories work, but perhaps Neuhauser explains it most clearly. "One of the theories for why stories are remembered so well is that you are using your 'whole brain' to take in information…Stories allow a person to feel and see the information as well as factually understand it…Because you 'hear' the information factually, visually, and emotionally, it is more likely to be imprinted on your brain in a way that it sticks with you longer with very little effort on your part (1993, pp. 4-5). Obviously, a lesson that is remembered is much more likely to be implemented.

Federal regulations for many of the high risk industries mandate training for new hires. Mining has, arguably, the strictest requirement for new miner training, with a minimum of 24 hours of safety training mandated for new surface miners and 40 hours for new underground miners, followed by at least 8 hours of Annual Refresher Training every year for everyone in the industry. This regulation was written in blood, like most of the laws found in the occupational safety and health arena. It is extremely important that new employees learn how to work safely, but all too often this training is provided in a way that prevents true learning from occurring. Cole says "many learners who receive...this formally codified and socially relevant knowledge tend to find both the content and the instruction to be burdensome, dull, and boring" (1997, p.334). Safety regulations are very relevant, but very few would ever consider them to be interesting. Stories have the power to take that dull, boring but very relevant information and make it interesting. If new hires are to learn the information necessary to having successful careers, they must first pay attention and then remember what they learned. Stories can certainly facilitate this process.

So where does a safety person find stories that will do this important job? From the workers themselves. People who have successfully worked in high-risk industries for a number of years have many stories to tell. Some of these may be about people they knew or people who taught them. Others may be about experiences they have had or perhaps, witnessed. Some may be stories that they have just heard. All of these stories have power and can be used effectively to transfer information. (An important thing to remember…stories need not be true to be effective. A good storyteller can weave many stories together to make a lasting impression and convey an important message.) Experienced workers are

credible to others inside their culture, and will command attention when they tell their stories. It has been my experience that they are also eager to share what they have learned. Because they are the "masters of their craft," they have the power to make those last critical steps from information to knowledge, knowledge to understanding, and finally, understanding to wisdom. Asking these masters to share that wisdom makes a lot of sense, doesn't it? (For further details on different types of stories and how they might be used, see my article "Tell Me a Story" in the July 2008 issue of *Professional Safety*.)

My Research – The Mining Years

The first project funded by NIOSH to create effective training for miners was considered a one-year pilot project to determine whether it was possible to develop training that was both effective and interesting. Stakeholder meetings were held with industry safety people to gather information about what training materials were available to them, what they needed, and what format would be most useful to them if new materials were to be developed. A list of topics was compiled and then prioritized to select the most immediate concern for the first training product. Video was the selected medium, both because it could be used by everyone in the industry, and because it provided a library of footage that could be migrated to other media. The first video we developed was "Handling Explosives in Modern Mines," followed quickly by videos on how to deal with roof falls, how to install various types of ground control, and how to work safely around powered haulage. (See Cullen, 2005 for detailed information on the first six videos developed, as well as a description of how the videos were evaluated for effectiveness.)

All of the videos created under this project shared some common characteristics. These included:

- Actual miners as the teacher-actors.
- Unscripted narratives – miners were simply told to explain something, talk about what they were doing, or correct someone who was not doing something correctly. Tribal language was encouraged.
- Topics that were generated by safety professionals in the industry, with specific details provided by recognized experts.
- Stories that were either captured on film from miner-storytellers or were invented by us to convey certain information concerning the topical hazards.
- Working mines as the setting.

We were also careful to include different types of mines, located in different geographic areas, so that the videos were more universal in their messages. The pilot project that was initially funded for a single year eventually turned into a full-fledged project that lasted for 7 years and included development and evaluation of 10 videos for mining and another for commercial fishing.

When the project first began, there were many who believed it would fail, because miners would not cooperate with a female "gommint" employee. This was never a problem; in fact, at many of the sites, we had so many volunteers that we had to extend our shooting schedule to accommodate their stories. If the stories they told did not fit the topic we were working on, we captured them anyway, with the expectation that they would become part of a resource to be drawn from at a later date. The companies themselves were also extremely cooperative, giving us access to their workers, their equipment, their sites, and their time. They were not compensated, but they did have the opportunity to help create training for their

industry, and influence how each topic was presented. This turned into "bragging rights" as the videos were developed and became more and more popular with the miners. We had no lack of companies willing to work with us, and were told it was because they believed we understood the industry and were "telling the truth" and representing it fairly.

Perhaps the best way to illustrate the unprecedented cooperation we had with the mining industry is to tell a story. As the training development project grew and topics were added to the list of what was needed, we were asked if we could create something that could be used in training mine rescue teams. Knowing that a mine in the area, the Sunshine Mine, had been the site of one of the worst hard rock mining disasters of the 20th century, I decided to use that as a backdrop for a new video for mine rescue. It was 2000, and the Sunshine Mine was approaching the 30th anniversary of the fire that killed 91 miners (nearly 2/3rds of its day crew) on May 2, 1972. We were finishing the training video on powered haulage at the time, and had been shooting some parts of it at the Sunshine Mine. I asked our "gatekeeper," Don Capparelli (a Shift Boss at the mine who was working with us on the haulage video) if there were still any miners at the "'Shine" who had been there during the fire. He told me that he was actually one of them. He volunteered to ask others he knew, to see if they would be willing to participate in the new video, and 27 agreed to do so.

The Sunshine miners were a tough bunch. Even in a segment of the industry known for harsh conditions and hard men, they were considered the toughest of the tough. Again, I was told that this video was never going to happen because these guys would never work with me. And once again, the critics were wrong. What was true was that in most cases, they had never told their stories before. Their culture did not allow them to take these stories home, or to even share them with new partners or new hires. Few of them had been interviewed by investigators after the fire. My concern was that they wouldn't remember what had happened. What I learned very quickly was that they will never forget. They told me stories that were heart-breaking, about escaping from the fire when their co-workers were dying around them, about going back into the mine to desperately look for survivors while the fire was still raging, about what it was like to recover the bodies of their friends, about how difficult it was to go back to work at the 'Shine when the mine finally re-opened with almost an entirely new crew. When I asked the men why they were finally sharing their stories, they told me it was because they liked the videos we were making and believed we would tell the truth about the fire and what happened in those tumultuous two weeks. I knew that these stories must be honored, and shared, so that no miners would have to experience this type of disaster again, and the project we were working on became much bigger than a simple video for mine rescue training. It became a documentary on the fire and the consequences of the disaster for the families, the mining communities involved, and the mining industry as a whole.

The video we produced, "You Are My Sunshine" (Cullen, 2002), has been shown all over the world. It was picked up by the local public television station, and shared by them with stations all over the country. Copies were sent to every state and more than 30 countries as well. And because the story is not just a story about mining, but about humans and their capacity for resilience, it is being used as a training tool by industries that have no connection to mining. It was even honored with a Telly Award in 2003. (Tellys are considered the "Oscars" for broadcast media such as cable, television, video, etc.) Most importantly, when it was released, we aired it for the first time in Wallace, Idaho, for the miners, their families, and the members of the mining communities that were involved. It is, after all, their story.

After "You Are My Sunshine" was released, we were inundated with requests and offers to collaborate. I also began capturing stories around the country, as these normally reticent miners realized their stories would be respected, honored, and used to help other miners, whom they considered to be their brothers. All of the videos we created are available from NIOSH at www.cdc.gov/niosh/mining/products free of charge. Most of them have been reproduced numerous times in order to meet the demand.

My Research – The Oil and Gas Project

In 2008, my time with the NIOSH mining program ended when I left federal service. I started a consulting business, and went back to work as a consultant to the new NIOSH Oil and Gas Extraction (O&G) Safety and Health Program. NIOSH had funded this as another exploratory project, concerned about the very high rate of fatal injuries in this industry. (The fatality rate has consistently stayed at over 7 times the rate for all other U.S. industries.) Because the program was small, the focus was narrowed to the E&P side, or Exploration and Production, and limited to land-based operations. This covers what the O&G industry refers to as the "upstream" operations, which include exploration and drilling, as well as completion activities. My assignment was to use what I had learned in the mining industry and apply it to the upstream O&G industry with the ultimate goal of developing effective training for the "roughnecks and roustabouts."

Roughnecks and miners have a lot in common. Their industries are high risk, and only risk-tolerant people will make their careers here. Occupational culture controls what they do, so the first task was to get out on the rigs and learn as much as possible about that culture. The Occupational Ethnography portion of the project was designed to learn as much about as many different facets of the upstream industry as possible. To date, I've visited 42 rigs of varying sizes in most of the oil producing areas of the country. NIOSH required us to develop a public/private partnership program with the industry, known as the O&G NORA (National Occupational Research Agenda) Council (made up of industry safety and health experts), which was has been extremely helpful in gathering information about what kinds of training materials were needed in the industry, as well as providing access to work sites.

Working with the O&G industry presented challenges and barriers not encountered previously. While the mining industry, which is regulated by MSHA (the Mine Safety and Health Administration), has a legal requirement for a minimum amount of safety training that must be provided for both new and experienced miners anywhere in the country, the O&G industry does not. Most of the large companies have internal policies requiring training, but the amount of training workers receive varies by company and location. In addition, MSHA maintains an accident/injury data base that is unequalled anywhere, driven, no doubt, by the fact that companies are required to report accidents within a very short time or face criminal penalties. O&G does not have anything comparable, with regulatory authority split among OSHA in some states, state agencies in others, and agencies such as the Texas Railroad Commission in others. Consequently, there is no overall database of what is happening to workers, because all of the regulatory groups require different information and there is minimal sharing (with the exception of information on fatal work injuries, which is collected by the Bureau of Labor Statistics).

A further complication stemmed from the fact that because NIOSH was largely unknown to this industry, many of the people initially encountered believed we were "spies from OSHA" and would not

allow access to their sites. In spite of these challenges, we learned about the industry, built an ever-expanding network of industry contacts, and relied heavily on our partners in the NORA Council to help smooth out the bumps. For a detailed description of how the project unfolded, see "Effective Training: A Case Study from the Oil and Gas Industry" in the March 2011 issue of *Professional Safety* (Cullen, 2011).

The O&G project has created four training videos so far, which are being used across the country and overseas as well. All of them follow the model developed in the mining industry, with industry safety professionals informing us on what the needs were, recognized insider-experts telling the story and providing the expertise for the topics, unscripted narratives that rely on the wisdom and knowledge of the masters, and everything shot on location. We are beginning work on our fifth video, and have cooperators already in place to help create it.

The Great Crew Change

Social researchers have long known that there is a crisis looming in the nation's workforce. The Baby Boomer generation (the largest in history) that resulted from the end of World War II and soldiers' return to civilian life, is getting ready to retire. Babies that were born between 1946 and 1964 are beginning to move out of the workforce and are taking with them 30+ years of organizational history and occupational wisdom. This has been called The Great Crew Change. Every industry is experiencing this migration, but for those high-risk industries that depend on the master-apprentice relationship to train new workers, this is a recipe for disaster. Those who work in these industries, whether they are miners, roughnecks, loggers, fishermen, or construction workers, do not learn their trade in a classroom. They learn it from those who have come before them, and along with on-the-job training in the skills of the trade, they learn the culture, and how to survive the dangers that are inherent in these types of occupations. Demographic studies are showing that up to 50% of our skilled workforce is ready to retire within the next 5 years. What will these industries do when there are no "masters" around to train replacement workers?

The current workforce includes an unprecedented four generations. These are generally referred to as:

- Traditionalists – born between 1925-1945
- Baby Boomers – born between 1946-1964
- Generation X (Gen Xers) –born between 1965-1981
- Generation Y (Gen Yers) – born between 1982-2002

Each of these has its own characteristics, expectations, preferences, strengths, and weaknesses. Each can be said to have its own culture, in fact. For the high risk industries, this situation presents some unique challenges. One observation made by contacts in the O&G industry, for example, is that new employees don't seem to understand much about hand tools, but are much more comfortable with computers and social media than their predecessors. There is a growing concern among the industries with how these workers are going to be trained and kept safe until they can acquire the 10+ years it is generally believed a worker must have before being considered competent in a field. The obvious dilemma is that the experienced masters will be gone long before the inexperienced replacements are fully trained. The consequences of having large numbers of "green hats" working in high risk jobs without the oversight of journeymen workers are frightening: increasing injury and fatality rates, lower productivity, higher turnover, and elevated insurance rates are among these expected consequences.

So what can be done to avert this situation? One solution is to gather the wisdom of the masters before they leave (and even afterwards if you can find them) by capturing their stories and using them to train new hires. Workers who have spent their lives in a field will have a strong connection to it, and, we have learned, have an equally strong desire to teach younger workers and to be considered masters of their trade. Having them as "virtual trainers" provides access not only to their knowledge of the work and the culture, but also to their credibility. Young workers don't have to be convinced of their unstated authority to speak about their work. They are believable, and very often, they are also very entertaining, as they share their experiences and the colorful characters they have worked alongside. How you capture these stories is another topic, entirely, but not only can it be done, it <u>must</u> be done. How else can an occupation preserve its cultural knowledge and wisdom? It has been said that while you might be lucky enough to be born smart, you can only earn wisdom through experience. And that experience often leaves scars. Stories have the power to allow trainees to experience these situations without being exposed to the dangers they include, or suffering the injuries that leave scars. The stories, and the feelings they invoke, are remembered, and become imprinted subconsciously, to be used if and when a similar danger is actually faced. Powerful, indeed, for trainers trying to protect workers while allowing them to gain experience and knowledge.

Summary

Developing safety training for high-risk industries can be a challenge. Those who chose to work in these industries are generally risk-tolerant, and have been described as "ten feet tall and bullet proof." Increasingly, these workers are also young and inexperienced. As the Baby Boomer generation moves out of the workforce, there is a growing knowledge gap that must be addressed if the miners and roughnecks, the construction workers and fishermen, and all of those who work in these types of jobs are to be kept safe as they gain the experience they need. Work stories have the power to communicate at a level that is not possible with other forms of communication, because they engage both sides of the brain and are imprinted into the memory with very little effort. Stories can be used to teach, to entertain, to illustrate, and to provide information on cultural norms, beliefs, expectations, and language…in short, all of the things new workers need in order to be successful over their careers. Master workers are an invaluable resource for these stories. Capturing the wisdom of the experts before they are gone is one way to preserve the knowledge they have earned, and to make it available to future workers.

Bibliography

Billett, S. (1994). Situated learning in the workplace: Having another look at apprenticeships. *Industrial and Commercial Training, 26*(11), 9-16.

Bruner, J. (1990). *Acts of Meaning.* Cambridge, MA: Harvard University Press.

Cole, H. P. (1997). Stories to Live By: A Narrative approach to health-behavior research and injury prevention. In D.S. Cochman (Ed.), *Handbook of health behavior research methods: Volume 4* (pp 325-349). New York: Plenum.

Cullen, E.T. (2002). *You Are My Sunshine.* Video. DHHS (NIOSH) Publication No. 2002-132d.
Spokane, WA: Spokane Research Lab/NIOSH.

Cullen, E.T. & Fein, A. H. (2005, Aug.). *Tell me a story: why stories are essential to effective safety
training.* (DHHS (NIOSH) Publication No. 2005-152, Report of Investigation 9664). Cincinnati,
OH: NIOSH.

Cullen, E.T. (2008) Tell me a story: Using stories to improve occupational safety training. *Professional
Safety.* July, 2008: 20-27.

Cullen, E.T. (2011) Effective training: A case study from the oil and gas industry. *Professional Safety.*
March, 2011: 40-47.

Haven, K. (2007) *Story Proof: The science behind the startling power of story.* Westport, CN: Libraries
Unlimited.

Lave, J., & Wenger, E. (1991). *Situated learning: Legitimate peripheral participation.* Cambridge, UK:
Cambridge University Press.

Neuhauser, P.C. (1988). *Tribal warfare in organizations.* New York, NY: Harper Business.

Patton, M. Q. (2002). *Qualitative Research and Evaluation Methods* (3rd. ed.)*.* Thousand Oaks, CA:
Sage Publications.

Schein, E. H. (1996). Culture: The missing concept in organizational studies. *Administrative Science
Quarterly,* 41(2), 229-239.

Van Maanen, J., & Barley, S.R. (1984). *Occupational communities: Culture and control in
organizations.* In Staw and Cummings (Eds.), *Research in organizational behavior: Vol. 6* (pp.
287-366). Greenwich, CT: JAI Press.