

If Your Organization is Fighting a War on Error, Take the Marines With You!

Introduction

As a former Marine aviator, and commercial airline pilot, I find myself in a new and exciting industry with cutting-edge technologies that rival sending astronauts into space. When I first started the journey into helping oilmen reduce human error, I asked myself, “What in the world can a Marine pilot teach crews on an oil rig?” What I found was amazing. The battles that the industry is fighting are the exact same battles with which we perpetually struggle in the Marine Corps and in aviation. We are all in an endless war against human error.

Force preservation is as essential in the drilling world as it is in the Marine Corps. However, preventing human error is not just related to safety: While people are always our most valuable resource, human error consumes other valuable resources and is the perpetual enemy of precision and efficiency.

The purpose of this paper is to relate some of the best practices and lessons learned that I have had the privilege of adopting from the United States Marine Corps to help your organization. It’s time that your tax dollars pay you back! There are five critical elements that I’ve taken from my Marine Corps and aviation career that span the gamut of industries and will produce significant results in both safety and efficiency for any organization that is fighting the war on human error. They are as follows:

- 1. Arm yourself**
- 2. Cheat when you can**
- 3. Lead at all levels**
- 4. Debrief every job**
- 5. Stop targeting Safety!**

The above elements each deserve its own technical and psychological dissertation. As a Marine Corps Officer, I typically only received the executable elements of what was undoubtedly billions of dollars in research. As such, I may not be able to credit the countless published researchers, authors, psychologists, and scholars that may have contributed to the foundation of my life lessons.

1. Arm Yourself with Knowledge

Why do we make errors? The airline industry has probably commissioned the most research in error management and it all started with the advent of the cockpit voice recorder. Since the 1950’s accident rates due to mechanical failure in jet transports has dropped steeply. As data on accidents accumulated, it overwhelmingly pointed out that a huge majority of aviation accidents could be traced to a breakdown in leadership, crew coordination, interpersonal communication, and team decision making in the cockpit. This knowledge came as a result of a compilation of data driven initiatives through NASA, regulatory, and other research organizations. As a result, the FAA, in conjunction with NASA and the aviation industry have developed several data collection and information sharing models. They include the Global Aviation and Information

Network (GAIN), NASA's Aviation Safety Program (AvSP), the FAA's Aviation Safety Action Program (ASAP), and the Flight Operations Quality Assurance (FOQA) program; all of which are meant to encourage the voluntary participation in collecting, analyzing, and disseminating safety information across the aviation industry in order to reach a goal of zero accidents. In order for this model to work, the FAA realized that information would only be reported if it could not be used against the individual reporting it. Therefore, the proposed FAA rule stipulates that "information obtained from such programs cannot be used by the FAA for punitive enforcement purposes." This concept of sharing safety culture surveys, near miss data, as well as incident data is essential in developing weapons to counter human error.

For instance, the knowledge that human factors accounted for most accidents and near-misses spawned research into the effects of fatigue and stress. Did you know that if you are fatigued, you are 50 times more likely to make an error? Yet, we let our crews drive through the night only to roll right into a 12 hour shift. And we also interrupt their circadian rhythm by swapping day shift to night shift half way through a hitch. During those high fatigue times, your crews are effectively working drunk and are more likely to make a mistake in their day-to-day tasks.

This knowledge also instigated a NASA workshop to develop a training concept called Crew Resource Management, or CRM. CRM has evolved through five generations and is a staple of both civilian and military aviation training and has also been implemented across multiple disciplines such as medicine, maintenance, fire and rescue, and the maritime industry. CRM training builds on the seven skills critical to operating in a high-risk team environment. They are:

1. Situational Awareness
2. Adaptability / Flexibility
3. Decision Making
4. Communication
5. Leadership
6. Assertiveness
7. Mission Analysis

CRM has played a significant role in aviation and by arming your organization with knowledge that is shared across your entire community; the collective best practices benefit the entire industry as a whole.

2. Cheat When You Can

When I was in college, I took a course called, "Applied Linear Algebra". To this day, I've yet to find an application for it, but that's not the point. On the final exam, the professor allowed us to bring in one standard sheet of paper with anything we wanted written on it and we could reference it during the test. He allowed us to bring in a "Cheat Sheet". Little did I know at the time, but my entire career would allow me to cheat during the execution of my job: Except we called them checklists!

My first exposure to an offshore rig was awe inspiring. The sheer scope of the operation was amazing with the technology that rivals NASA's Space Shuttle program. However, I was extremely surprised that I never once saw any crewmember reference a checklist. Not to say they are non-existent, but in the four years of coaching

crews, I have yet to see a checklist used during operations. This was a culture shock. I can't imagine NOT referencing a checklist!

Before they were the norm, can you imagine the first time a seasoned pilot was told that he had to reference a checklist? I can only imagine an old, gruff aviator barking, "I take off and land every day, I don't need a _____ checklist to tell me how to do my job!" But, as the above mentioned data collection efforts began to paint the whole picture, it became readily apparent that regardless of how well we knew our job, we were still human and were vulnerable to interruption, distraction, and complacency. We are especially vulnerable during times of duress and stress.

There are many theories for why and when checklists should be used, and how to apply an effective checklist. All I know is that as a pilot in a commercial airline, I would refuse to fly without one. Although takeoff and landing are the most routine tasks a pilot ever does, an aviator NEVER does it without a checklist.

I would like to challenge the industry to make checklists as routine as wearing steel toe boots. It will not be easy: It will be a training and standardization challenge and will take a substantial effort to ensure that crews use checklists effectively. It will be worth the effort. Checklists breed standardization – Standardization builds precision operations.

3. Lead at All Levels

How many books are written on Leadership? If you Google the word leadership, you will receive 210 million results. The Marine Corps has been around for over 236 years and leadership has been a cornerstone of its success. Marine Corps leadership is based on 14 traits and 11 principles. I share them with you below. Feel free to substitute the word "crew" or "employees" for the word "Marine":

Leadership Traits	Leadership Principles
1. Justice	1. Know yourself and seek self improvement.
2. Judgment	2. Be technically and tactically proficient.
3. Dependability	3. Know your Marines and look out for their welfare.
4. Initiative	4. Keep your Marines informed.
5. Decisiveness	5. Set the example.
6. Tact	6. Ensure the task is understood, supervised, and accomplished
7. Integrity	7. Train your Marines as a Team
8. Enthusiasm	8. Make sound and timely decisions
9. Bearing	9. Develop a sense of responsibility among your subordinates
10. Unselfishness	10. Employ your command in accordance with its capabilities
11. Courage	11. Seek responsibility and take responsibility for your actions
12. Knowledge	
13. Loyalty	
14. Endurance	

The principles and traits listed in the table above come without title, rank or positional responsibility. Every Marine from Private to General uses this “checklist” as the foundation to develop into a great leader.

4. Debrief Every Job

A debrief culture is imperative to achieving precision operations. Once, as a junior aviator, I had the opportunity to sit in on a Blue Angels airshow exhibition debrief. It was an “ah ha” moment for me. Even the best aviators in the world were never satisfied with their performance. Each pilot had a chance to critique the flight as well as his personal performance and would commit to the entire team what he was going to fix for next time. The tone of the debrief was positive and professional, but as they shared their minor errors from the show, it sounded like a failed mission. I had witnessed the airshow and it was awesome. That is when I understood, *THERE HAS NEVER BEEN A PERFECT MISSION AND THERE NEVER WILL BE DESPITE OUR EVERY ATTEMPT.* Armed with the knowledge that I will never have the perfect flight, I welcomed each debrief and routinely accepted criticism and mentorship in an effort to seek continual self improvement and become technically and tactically proficient. (Leadership Principles numbers 1 & 2)

After Action Reviews in high performance industries need to be as routine as wearing Personal Protective Equipment. Every job should start with an objective that is clear, concise, and measurable. Then it actively needs to be communicated to all relevant parties (Leadership principle #4), executed to precision, and debriefed against the highest possible standards of excellence. During the debrief, the crew should evaluate the effectiveness of the mission and how they performed as a team as well as individually. If during a debrief, you have nothing to improve upon, then you are not looking hard enough. It is only through multiple iterations of this simple concept will you ever achieve precision.

5. Stop Targeting Safety!

What is the measure of success in any operation? When I ask crews if they thought the job was successful, 9 times out of 10, I’ll hear an overwhelming, “Yes!” When I ask why they think it was successful, I typically hear, “We got ‘er done and nobody got hurt!” While that is a measure of success, no organization will ever improve if safety is the target. If you were to lay out the full spectrum of performance from Unsafe to Perfection, where would safety fall in that spectrum: Closer to Unsafe, or closer to Perfection? Let’s take a look at the performance spectrum as defined by Korn:

UNSAFE	SAFE	EFFECTIVE	EFFICIENT	PRECISE	PERFECT
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If we assume that the Blue Angels are correct and there is no such thing as PERFECT, then where should we target as an organization? We need to shift our paradigm away from targeting SAFETY as a goal and move our aim point to PRECISION as an industry. ***Precision operations are inherently safe*** and are only achievable through standardization and rigorous training.

Conclusion

I am fortunate enough to be able to observe many fine companies across many different cultures. I get to witness the best practices from all of these sources and implement great ideas that are coming directly from the front line workers. I am also privileged to observe countless leadership styles and personalities and get to apply lessons learned from both positive and negative examples. The demographic of the Oil and Gas industry is identical to that of the people with which I was so privileged and honored to serve. As my loyalty (Trait 13) to your industry grows, so does my commitment to industry excellence.

The lessons learned in military combat and aviation have a tremendous amount to offer to Oil and Gas, both in Human Factors training, and regulatory *overcompensation*. We need to understand that we are human and will make errors. The only way to manage that fact is through a systematic method of **crosschecks, mutual support, and leadership**. **Crosschecks** are built on the knowledge of human behavior. If we know a human will fail under certain circumstances, we mitigate the circumstance through the use of standardized procedures and checklists. **Mutual Support** eliminates single point failures and adds another set of eyes to the job. A combat pilot never flies without his wingman! Mutual Support also implies a culture of continuous training and mentorship. Training frequency should not be measured in years, but in days. It should happen every day on every job. **Leadership** is a critical skill in Crew Resource Management and team decision making; and will always have room for improvement. Just as the Blue Angels have never had a perfect performance, one can only strive to be a perfect leader.

We have entered an era that will change the industry forever. Some safety practitioners feel that by piling on more organizational policies and procedures, the organization will fix the people. Unfortunately, human error is inevitable and it's personal. We are fighting a war against an enemy that knows us better than we know ourselves.....

About the Author

Troy "Korn" Kehoe is an expert at planning, briefing, execution and debriefing (AAR) as well as an authority on everything training. He proudly served three combat tours as a United States Marine Corps AV-8B Harrier pilot, flew commercially for American Airlines and facilitated the development of the training system for the F-35 Joint Strike Fighter Program. As an expert instructional systems design and human factors, Korn was instrumental in the F-35 pilot training syllabus, simulator scenario development as well as the simulator instructor operating system design. Korn now serves as the Chief Operations Officer for Check Six Training Systems, Inc.