Lessons Learned in Safety
By Major Chris Dotur

Over 15 years and multiple safety positions, I have repeatedly been somewhere at just the right (or perhaps wrong) place and time when significant events occurred. As a result, I have investigated all sorts of incidents, putting operations on a temporary pause to further Air Force, Department of Defense (DOD), Federal Aviation Administration (FAA), National Transportation Safety Board (NTSB) or foreign safety programs. While most have been US Air Force flight incidents, the events have had little rhyme or reason, involving a variety of types, scopes and players. Thankfully, I have always been on the investigation side, although I have assisted coworkers and units with incidents they have been involved in themselves.

On the advice of colleagues and as I get closer to the completion of my own Air Force career, I have put together a pamphlet of various safety tips, stories and personal techniques I learned over the years. Most of these tips focus on safety investigations and particular interviews, but also touch on other safety practices. Many focus upon tactical or hands-on activities, but I do include some discussion for the higher operational and strategic levels as well.

While some lessons might not be direct, I believe they contain principles worth reminding other disciplines and leaders throughout safety programs, command leadership, accident investigators and perhaps even organizations like law enforcement and emergency responders.

While this is intended to be a “lessons learned” reference for other safety personnel and to augment existing guidance and training, these suggestions are my own and are by no means a definitive source. Personnel may find that different practices work for them. Of course, anywhere that my own thoughts may unintentionally conflict with established organizational guidelines or current headquarter instruction, higher organizational regulation or guidance take precedence.
PART I—General Safety Program Practices

Safety is all about two words—mishap prevention. No matter how obvious this might seem, never forget that basic principle and fight mission creep and divergence from the safety program. Everything we do in safety is about preventing accidents. Remember the Air Force service-wide quality initiative of the 1990’s? Many units were unsure how to implement this, or who the responsible office should be and gave it to the closest safety office to handle as a secondary duty. This kind of practice, while a commander’s prerogative of course, dulls the direct focus and power of the safety program’s purpose. I have started every safety job by meeting with my team and giving standing instructions—safety members come see me if they see us getting off the clearly defined track of mishap prevention.

It is easy to get wrapped up in procedures, reports, paperwork, metrics, etc., but we cannot lose sight of the ultimate goal. A good safety officer, as a leader, will also periodically pull back from the weeds and consider how to make the program more effective overall. Safety does not exist for its own purpose, of course, but should always seek to improve operations and protect personnel through actions that are genuinely effective at preventing mishaps.

It is also important to remember that everything we do is about people and this becomes increasingly imperative the more senior we get, in roles of more responsibility and authority. It is perhaps even more important as we get away from daily front line operations, into unit leadership, or program management administered from a desk. We can go cross-eyed with things like mishap rate charts, but never forget that each little square on that chart is a person, possibly a person that is not with us anymore and certainly a person that does not need to be a part of that chart. That little square could be any of us. Could be you. Could be me. Every single one is important and we all have to do everything we can to make sure our people do not become that next square on some chart.

Do not make safety program a hammer. As it is, you will have to fight some perceptions that safety is “out to get” people and get them in trouble for doing things wrong. You will also occasionally hear people say something along the lines of “You filed a safety report on me.” Fight this at every turn. Safety is never about pointing fingers at people and there are separate legal and administrative processes for finding culpability and establishing accountability.

If the safety process is ever directly misused to get people in trouble, the program (and you as a leader or safety officer) will lose credibility and inhibit the fundamental purpose of mishap prevention. Even if an organization were to allow their safety program to pursue mishap prevention through punishment or other negative emphasis, it would have fairly limited effectiveness.

Never settle for the status quo. Now, a leader or safety officer should not constantly hound people on every little problem, of course. That is a quick way to wear out your welcome. Pick your battles, but do not give up on them. If you can improve operations and make life better and safer for your people, why would you not? Even when an organization is on a good streak with mishap rates, a lack of active engagement from leadership and safety staff will eventually make the unit fall apart.

Safety is truly all about leadership. Always look for ways to make things better, working towards that idealistic and practically unreachable (but essential) goal of zero incidents. If we as leaders settle for the status quo, our people will settle too. Remember, that small
defect that you allow to persist today, may be the exact thing that grows into a mishap next month.

Certain aspects of a safety job are actually downright easy. A good part of making a difference in your organization as a safety officer, like leadership, can be accomplished just by being present. When there is a planning meeting for any activity, often all you have to do is have you or a member of your team quietly sit in the corner and listen.

Members noticing your presence will often be enough to prompt thoughts of scaling back “cowboy” operations and incorporating risk management. You will even hear playful comments of “Careful! Better watch yourself. Safety is here.” This is where the reputation you build and maintain pays off, that your presence is (maybe a bit reluctantly) viewed as a friendly reminder of building in safety principles to every area of operations, not resented or perceived as a roadblock.

Attending these meetings can also pay off for you to stay abreast of operations. It is much easier to keep things on the right track in a planning meeting with a quick reminder of safety principles (e.g. “let’s not plan on parking fighter jets armed with missiles pointing at the bomb dump”) than trying to undo things later because plans were put together without your input or knowledge.

Since safety is the commander’s program, safety officers by default should attend the meetings s/he leads. You will be there to take taskers and discover other ways you can assist the organization’s activities, enhancing mission effectiveness. I have found that these practices are especially important at the tactical and operational levels in contingency settings, where new and higher-risk operations are put together. They are less important in the sustainment of well-established home station administration functions.

I believe a safety role has similar functions to an instructor, using lessons to affect learning in coworkers, so they become more capable, more knowledgeable and more aware workers. One perspective I hold to is that if I am able to help my people become better at their job than I myself have ever been, that is not a loss for me or my pride. That is a win, for my people, the organization and me. Another view I hold is that the instruction or safety lesson I give today could end up being the exact piece of knowledge my troops need to prevent or survive a mishap tomorrow. When you really think about that one, it can keep you up at night.

I myself have been fortunate and never had an emergency we could not eventually overcome that became a mishap. But others have had different results and I have played a small role in every one of my best friends, squadron mates, co-workers, students, classmates, aircrew, supervisors and others under my leadership or command who have had a mishap. In some cases, that influence was positive and they were able to walk away from the mishap in the best possible circumstance. Others were not as fortunate. For the rest of my life, I will bear a small responsibility for every one of them that have lost their lives. There have been far too many.

We never know ahead of time exactly what situations someone will encounter and how they will respond. I may not be at fault, but as a safety officer, instructor and leader, who knows if I had imparted just a little more checklist discipline to the person, or lessons learned from all sorts of mishaps in my bag of experience, whether they may have avoided or overcome that mishap and still be here today.

Remember that in safety, whether in active mishap prevention or emergency response, no organization is really alone. The best safety meeting I have ever had, we brought in Capt. Al Haynes, the renowned captain of the United Airlines Flight 232 DC-10 that crashed-landed in Sioux City, Iowa, in 1989. We used the opportunity to have more than just USAF aircrew at the meeting. We brought in local FAA personnel, NTSB, firefighters, police, civil airport, civic leaders, etc. and everybody rubbed shoulders. When a big event happens, it will not be just blue suits involved. Just as hap-
pened in Sioux City, your team will need to be able to respond and interact with every local resource.

Continually Learning From the Past

We are all familiar with various axioms of the importance of learning from the past. It is rather obvious that one primary tenet of any safety program is to learn from past organizational and personal mistakes, to prevent future mishaps. In military strategy, we often talk about “fighting the last war,” where we learn from events of the previous conflict, but then misguided assume the next conflict will be like the previous one, with similar geopolitical conditions, conflict players, weaponry and strategies. This has proven to be a dangerous assumption.

Safety is somewhat different, as we have virtually run out of new ways to crash vehicles and aircraft, hurt people and mishandle weapons. The precise circumstances of the next accident may be different from the last one, but it will almost certainly duplicate exact causes and factors that have led to numerous other mishaps throughout history. Long after the first car, the first aircraft and gunpowder were created we are still crashing and exploding these things the same way people did years ago. Safety and occupational health practices have been developed because all across the world, people have the potential to get hurt in exactly the same ways.

Modern technology and repeatedly revised culture and practices have drastically reduced many mishap rates. Today, we have all the knowledge and lessons of the past more readily available than ever before, paired with the finest technology to date. Yet somehow, we still find ourselves crashing perfectly good aircraft and vehicles, things still manage to break and our people still have accidents. Even (or in some cases particularly) when we remove the human factor from activities and attempt to add automation, the same mishaps occur, or are replaced with new factors.

Not only must we learn from the past, we must do so perpetually. A particular lesson steadfastly ingrained in any organization will gradually fade from memory if not given a periodic reminder. With steady person-nel turnover rates, it is amazing how some lessons are completely forgotten in 3 to 4 years, even in units with severe mishaps. Even though revisiting those mishaps a few years later may reopen some emotional wounds, I have found it can be very valuable to do so.

In general, properly trained safety personnel can quickly gain invaluable insight into mishap causes, historical cases and operational approaches to risk management and mishap prevention. There have been many occasions over the years, whether in the cockpit, out in the field, sitting behind a desk, or in a strategy planning meeting, where I have suddenly had a feeling things just did not feel right. In many cases, I recognized similarities to chains of events that had previously led to other mishaps I had either investigated or studied. By just pointing it out to the team, we were able to break our own chain of events and avoid a potentially impending mishap.

Of course, safety programs do not exist just for the knowledge of safety personnel, so it is vitally important that safety professionals repeatedly pass on insight and lessons learned to develop others’ intuitions as well. This can be through formal instruction, “there I was” type stories, or just small talk at the water cooler. Even safety members with no personal investigational experience often have learned invaluable lessons from accident case studies, which coworkers will never benefit from if not discussed. I will come back to the topic of teaching safety lessons later in the section of post-investigation actions.

Returning to the issue of automation, I urge great caution to any industry considering the topic, with the strongest of warnings to aviation. While ever-ubiquitous technology may provide new tools for users and increase safety in some areas, it is far from a panacea—quite the contrary. Continually incorporating more and more gizmos and technological features into any operation inherently brings with it additional new
risks. These dangers may be from the technology being misunderstood by the user, misused, distracting the user from higher priority tasks or potentially malfunctioning and causing a mishap where the user has no ability to override the technology. These risks must be realistically faced with eyes wide open and appropriately mitigated at every step.

I wince inside every time I hear an early adopter of some technology proclaim how it could not possibly malfunction so badly as to cause a mishap. In general, anyone who says “that could never happen” should immediately stop and check themselves. I could point out any number of incidents where the unthinkable of some sort has happened, despite all proud claims it never would—all sorts of natural disasters, United Flight 232 losing all hydraulics on a triple-redundant DC-10, Air France Flight 296 flying an Airbus 320 straight into trees at the end of the runway and exploding, B-2 systems overriding the pilot and forcing an unrecoverable stall on Guam, or even Asiana Flight 214 unable to perform a basic visual approach to San Francisco and crashing when the ILS was not available. We must learn from these as well, along with the humility of never putting ourselves beyond the possibility of mishap involvement.

Contingency Operations
As of this writing, the U.S. Air Force is in a time of cultural, operational and mission scope change. The vast majority of our people entered the service after Sept. 11, 2001. All they know is service at war, although actual combat has somehow become a segmented and disjointed part of the service. This has created a curiously skewed perception of contingency operations, which have been sustained in some cases for 13 years or more. Some of our people have no experience other than combat-related operations with waivers that have become standard and higher risks that are now assumed to be always acceptable because of how important the mission has been.

As we draw down and end various combat operations, those with combat experience need to capture and pass on this vital experience to the next generation. Hopefully this new generation will live at least temporarily in an era of peace, but must be prepared at every moment for any contingency. Modern reality is also proving that peace is increasingly elusive. Other personnel will remember the different service and life in the military before Sept. 11, how shocking those unexpected attacks were and how everything changed as we mobilized for war. This too must be captured for future generations and their ability to mobilize for contingencies.

In 2002 I wrote an article to capture some lessons learned from the start of Operation Enduring Freedom, as we deployed into austere environments far around the world, to start very new and different operations. One particular important principle I would like to repeat here is fighting the “we are at war, so anything goes” syndrome.

This phenomenon is huge and something that happens almost naturally when commencing contingency operations. It also occurs every time new personnel join an established contingency. It is a basic perception that the dire importance of the contingency overrides the need for established practices. Leaders at every level in every organization should address this problem to set unmistakable priorities and give clear guidance for mission execution.

New circumstances and challenges in contingencies often require creative thinking, problem solving and a hard-charging warrior spirit of domination. However, regulations (and, most importantly, the reasons for them) do not disappear when we deploy. Just because we are not at home, thinking “outside the box” does not give us latitude to do whatever we want.

We fight the way we train, adhering to standards, to keep damage focused upon the enemy, not ourselves, which hinders mission capability. The contingency commander will most likely decide he or she would rather accept a slight slowing of operations, instead of rushing things or taking a cavalier approach that could lead to a mishap.

Safety Briefings/Meetings
Unit/installation safety meetings should not be under-
estimated in value. Although they are just one small part of a safety officer’s job, these meetings have a disproportionately large impact on the organization and the safety office’s influence. Air Force Wing Flight Safety meetings typically only happen four times a year. You could have the best safety office in the Air Force, with the best safety programs and investigations, be totally on top of every safety report, but if you screw up a safety meeting, the entire base/Wing (likely to include the commander) will perceive the safety office as a poor organization. The reverse is actually true as well—a struggling safety office, that buckles down and puts together a good safety meeting, will score big points and can help start down the road to organizational health. Do not forget how important credibility is for safety personnel and leaders alike.

While safety meetings are far from the most important thing in safety of course, I put a lot of stock in them. You may send out informational messages every other day, visit with people and work tirelessly behind the scenes with safety members and leadership to carry out programs. However, these meetings are your distinct, unique opportunity to directly interact face-to-face with every single member of your organization all at once.

A good safety meeting is approximately 40% content and 60% presentation. Just like any other public speech, if you have the best content in the world but present it poorly, you will fail hard. No matter how great your meeting content is, if your team does not present it in a way that is effective and interesting, the only thing you gain by having the meeting is checking the regulation requirement box.

Here are some other in-the-weeds pointers on building a safety meeting, which I include as I have seen so many problems with them:

Put together a string of interesting videos maybe 20 minutes long and start the videos playing about 15 minutes before the start of the meeting. This will keep everyone entertained as they get seated and avoid silence if the commander is delayed past the scheduled start time. Remember to embed the videos inside the PowerPoint presentation to start automatically and store them in the root directory folder. This will make the PowerPoint file size huge, but it is worth it. Do not try to link the videos. Inevitably, on the meeting computer, they suddenly not work. Trying to switch between a presentation and separate videos only invites disaster, unless you have one important, dedicated video that really is worth it. (e.g., a 5-minute instructional video or mishap recreation)

Meet your arranged audio/video/computer experts at the briefing location at least 45 minutes early; 60 minutes or more is even better (no matter how much they insist that 25 minutes is fine). Without fail, some briefing system component will need re-configuration and you do not want the stress of having your team scurrying to get the audio system properly running 10 minutes before the Wing Commander arrives, with hundreds of people watching you flounder. Bring three copies of the presentation, as at least one will inevitably not work. Then move all files to the briefing computer built-in hard drive and do not try to run from an exterior source. Check how every slide and video looks and sounds in the briefing room—slide formats can get adjusted on a new computer and things often look and sound differently in a new setting.

Take every opportunity to get guest speakers for your meetings, on any number of subjects. As a safety officer, your unit will be seeing you more than enough in these meetings as it is and get bored with you. As I mentioned, reach out beyond your installation and bring in outsiders from the community and beyond. Often, these guest speakers will be thrilled with the opportunity to come brief a bunch of Air Force flyers. I will tell them, “This is a prime opportunity for your organization to reach every flyer on base all at once and influence operations.” That can be quite appealing, particularly to aviation partner organizations, such as the FAA.

It is always a good idea to do a dry run a couple of days before the meeting, with every speaker. Only excuse someone with whom you are familiar and hold the highest of confidence in as a breifer. There are few things more painful than watching one of your briefers in your meeting flounder on stage in front of everybody, because they were nowhere near as prepared and eloquent as you assumed. Take the opportunity to ruthlessly scrub each other’s briefing slides for content and typos.
Always remember that safety is the commander’s program and meet with him or her to get their high-level guidance. Talk to others that have worked under your specific commander before and get a feel for what kind of meetings the commander likes to have. I have seen more than one hard-charging chief of safety put together a great briefing through enormous hard work that was very serious and professional, only to come away from the briefing red-faced because the commander afterwards said they did not like it because it was not funny. (This highlights the importance of always starting a project by understanding the boss’s intent)

When allowed, I highly recommend going with funny meetings. Come up with a style that works for you though, so the presentation is not forced.

Personally, I like a group of subject presentations with funny videos between each subject. Although some people insist transitional videos and other associated pictures should be something that ties in to the briefing subjects, I gave up on that a long time ago. Off-the-wall, little 20-second clips are great for keeping the audience on their toes and paying attention. Playing a clip between each subject also allows each briefer to hand off the clicker/pointer to the next briefer and get settled in at the podium or other briefing point. This keeps up the briefing energy, without silence.

Of course, anytime a mishap is briefed, proper reverence should be observed and at the very least that portion of the meeting segmented from the rest, without humor. As safety officers, we should never forget that numbers, stats and reports truly are about real people, who have had real things happen to them. Some of these experiences are horribly bad.

Safety meetings should ideally be a total of 30 to 40 minutes long. Any shorter than that and attendees will not take it seriously, like It is just a quick requirement filler. When they are longer than that, naturally you will lose your audience to boredom, which you always have to fight anyway.

We always ask if there are any questions at the end of briefs, but the culture usually seems like nobody wants to have the guts to ask, or the offer for questions is insincere. If we are going to maximize effectiveness of safety meetings, the greatest learning comes from questions asked at the end, which can sometimes spawn some very heated multi-party discussion. Sometimes I will deliberately wait in long uncomfortable silence until somebody asks a question or adds their own input and try to get people to start throwing rocks and spark debate.

PART II—Safety Investigations
To tell a secret, most safety mishap investigations are fairly easy, when it comes to the first root purpose of figuring out what happened. Particularly in contemporary aircraft mishaps, with modern aviation technology including multiple data recording devices, an investigator can often determine the essential event information in the first few hours of an investigation. After that, challenges often arise in figuring out fine-print details that may or may not be important to a mishap’s root cause, answering questions of why it happened and, perhaps even more difficult, how to change the organization to prevent future mishaps. There are exceptions, of course.

Perhaps the greatest roadblock you will encounter as a safety investigator is a cultural attitude that can unfortunately be found in every area of the Air Force and even many levels of leadership. This concept can be summed up in seven words: “It is just one of those things.”
There is a human tendency to shrug the shoulders and resign ourselves that sometimes random and unexpected bad things just happen. You will encounter lots of people that think a safety investigation is way too uptight in getting down into the details and scoff at such scrutiny that they perceive as making more of something than is really there. Unfortunately for safety investigators, (but fortunate for the Air Force and all that benefit from investigations) we are not afforded the maligned luxury of throwing up our hands in surrender and writing off any mishap as unavoidable fate. Every activity carries with it a level of risk, which we tacitly accept and seek to manage when we engage in that activity. However, no mishap ever just spontaneously happens without some sort of root causal factor that had it not existed, would have prevented the situation from occurring in the first place. Every incident really is preventable.

I have seen cause problems in multiple investigations—regardless of your particular role in or related to an investigation, always remember who you and your people work for (More on wearing different hats, specifically in interviews, a bit later.)

Safety is the commander’s program and each safety investigation is clearly directed and owned by a specific commander as determined by the mishap’s particulars. Regulations clearly dictate that personnel assigned to an investigation work directly for that commander who is the “convening authority” and are temporarily relieved of all other duties. For impartiality and to prevent outside influence, other personnel must stay out of investigations. On paper, this seems clear, but this can be surreptitiously violated even sometimes with well-meaning intentions. For one reason or another, a commander responsible for convening an investigation may not realistically be able to use an investigator from outside the mishap organization, which can clutter chains of command and impartiality. Although that investigator theoretically works only for the convening commander during the investigation, their performance evaluations are likely still written by subordinate supervisors inside the organization and there are long-term conflicts of interest. Well-intentioned people in support roles may want to make sure investigators have everything they need, run interference, or help gather information, but must ensure that they do not overstep their bounds or interfere with the investigation. The installation and safety office who are hosting the investigation are particularly susceptible to this. Especially with high-interest mishaps, every single person wants to feed their bosses updates to keep them informed on the investigation status and prevent later surprises.

If the investigation chain of command is not clearly preserved, things can get very messy with clearly inappropriate involvement. Extra care must also be taken to protect the safety investigation as a completely insulated and contained process. You must not compromise the ongoing investigation and greater safety program with leaked safety information.

Immediately Capturing Mishap Information
Everyone is familiar with the standard practice following a mishap of having those involved immediately write down a statement of what happened. This is both effective and quite important, particularly since human memory naturally degrades and changes as time goes on. When a mishap occurs on a Friday evening, after gathering up immediate pictures and physical components of the mishap, complying with any particular requirements such as mishap notification, it is easy to decide with the best of intentions to pause the mishap response/investigation until Monday morning. For whatever reason, Friday evening mishaps seem to happen, or damage discovered, after several participants have already gone home for the weekend. Of course, we want to be understanding and allow people to have their deserved time off and may be hesitant to call someone back in when they have already left. I hate to be a Grinch, but highly encourage you to do so anyway.
By the time Monday morning rolls around, not only have people's memories degraded, but they likely were not thinking about work or the event at all over the weekend. If they did not know that a mishap occurred on Friday, their short-term memory may have completely dumped all recollection of Friday's activities.

Inevitably, on Monday some of your participants have gone on vacation or are off doing something else. You will go to maintenance supervisors on Monday only to find that due to changeovers, requests for records were not passed on, broken parts were already fixed or discarded, logbooks updated, etc.

It is not fun to see a blank stare from a person of interest that does not have a clue what you are talking about. This is not to say that you have to work the immediate investigation through Friday night or even over the weekend. But have all participants write out a statement before the weekend, capture important records and do important interviews right away. When you get to a good pausing place, only then you can break for the weekend.

**Steering the Investigation**

In an investigation, it can be counterproductive to theorize and develop preconceived notions before all the evidence comes in. However, follow your instincts on clues that you discover and track down trails that clues point to. Every investigation is comprehensive in one way or another and as you gather data and discover areas that are deficient or of interest in some way, keep peeling that onion apart to see what is inside those outer indicators.

Pay attention to the evidence you find, but just as importantly, pay attention to what is not there. One of the most interesting investigations I was a part of regarded an E-8 JSTARS aircraft in Southwest Asia that had a fuel system malfunction upon initial air refueling in combat and returned to base. The system and aircraft performance went further downhill during recovery, with problems compounding, but thankfully they got it on the ground with everyone safe. Post-flight inspection revealed multiple fuel tank ruptures in the wing, with many broken load-bearing structures. It was scary as we found more and more damage like buckling on the wing before we even got it off the runway and we are lucky we did not lose the entire airplane and large crew that night.

As we dove into the immediate investigation, though, we discovered a notable absence of any contributory information that was out of the ordinary. All fuel checked out normal, mechanical systems were working fine, aircrew procedures seemed within standards and appropriate, no problems with maintenance, weather, the tanker, etc. We could have spent an indescribable amount of time picking apart any number of possible factors, searching for a random golden BB that could have magically caused the mishap. Instead, both the Safety and Accident Investigation Boards carefully followed the clue trail and most likely causes for this particular event and eventually discovered that small plugs had been left in the fuel venting system during the last depot overhaul. The particular circumstances of this flight had caused the wings to over-pressurize internally and begin to rupture like a balloon. We came within minutes of having the wings fail catastrophically in flight and losing the entire jet.

In March 2014, Malaysian Airlines Flight 370, a heavy Boeing 777, went missing while crossing into Vietnamese airspace under strange circumstances. Cable television news programs were full of supposed aviation experts and even trained professional investigators confidently asserting to the fascinated world that any number of various things must obviously have happened.

Wild speculation became rampant, which literally included even a meteor collision, black hole and supernatural involvement. In an investigation, speculation gets you nowhere and jumping to a conclusion before gathering all the information can invalidate the entire process. Even in the most difficult of investigations, you must rely on the total package of evidentiary clues that will point you in the right direction. Careful and thoughtful analysis of the evidence that is present and what is not there, will prevent you from wasting time on false “leads” that are not supported by fact. Speculation is not the same as educated intuition!
The 5 Levels of Why
When determining a mishap’s root causes, the Air Force Safety Center teaches to use the “5 levels of why” methodology. Originally developed by Toyota, it is an incredibly valuable and appropriate approach to investigations. In practice, it is easy in investigations to stop at the first or second “why” and consider ourselves done. For example, “Why did the airplane crash? Because the pilot turned into the mountain, obviously.”

Of course there is much more to it than that and stopping prematurely shortchanges your responsibility to find the root cause. The real problem probably is not person X doing something wrong. Remember, that people really do not come to work with a goal of doing something wrong or having an accident that day. Your real problem likely lies in several more levels of “why”, which explores the reason that person X chose those actions, or that part Y stopped working correctly.

During an investigation, I recommend being as “ridiculous” as deliberately and systematically writing this methodology down on paper or a white board. This can be done in a few ways, but can be as simple as just numbering lines 1-5. On line 1, write down “Why did XXXXXX occur?” using the basic particulars of the mishap. Lines 2-5 can just say, “Why?” Each time you find the answer to a line, write down the answer right below it and move on to answering the next line. You may need to go to four or even seven levels for your particular mishap, but the final answer will be your root causal finding.

Leading an Investigation
One practice I have found useful when in charge of a large investigation with multiple board members is to rally everyone together at the end of each day. You do not want to hear a report of everything everyone’s done that day, but rather share significant bits of information that people have discovered during the day which may help direct other members’ investigation portions. Keep a white board in the secured main boardroom that has select bits of important mishap/investigation details on it and you can track the mishap in whatever way you see fit. I like to keep a running list of possible mishap factors. During one of these daily meetings on day one to three, the team can brainstorm all possible contributing mishap factors and populate this list.

From there on, each night the team can decide which factors have been eliminated as possibilities, move them to a non-factor list and then focus on the remaining factors to investigate. (Consider Sherlock Holmes’ principle that when you eliminate the impossible, whatever remains, however improbable, must be the truth.) This keeps the investigation organized and systematically tracking on what still needs to be explored.

Finally, each night, I like to go around the room and ask each person what they are doing tomorrow. They know this is coming, so it is not a surprise. My purpose is not to put them on the spot, but rather keep each member focused and organized on what short-term tasks they need to accomplish, to further the overall investigation. This also eliminates duplicated efforts between members and helps them see which activities they need to coordinate or deconflict with others.

Investigations vs. Operations & Immediate Mishap Response
From the first moment in almost any safety investigation immediately following a significant mishap, there will be pressure from operations. This is magnified exponentially in combat zones. For safety investigations, it would be ideal if all equipment, personnel and mishap sites were impounded for our sole purposes through the duration of the investigation, just in case something needed to be inspected further at a later time to find the “smoking gun.” But of course, this is not realistic and accidents rarely happen in sterile situations and locations that allow for easy, compartmentalized safety operations. The group commander wants her equipment back. The squadron commander wants or may even need his people back to keep doing the mission. When you get the mishap notification call for you to spin up a safety investigation, as soon as you hang up you will get a second call from the wing commander, asking why you are keeping his damned runway closed and asking what your plan is for getting out of his way. (This may not be much of an exaggeration at all.) When my flying unit tragically crashed a C-17 at Elmendorf AFB in 2010, the wreckage landed...
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on and damaged vital Alaskan railroad tracks and there was immediate intense pressure to get the railroad reopened as well.

This is why U.S. Air Force mishap response doctrine designates the Ops Group commander as the Interim Safety Investigation Board President. This makes sense for no other reason, since they will also be so busy with other duties following a major mishap. The OG/CC can choose to balance these conflicting priorities.

When a major mishap/disaster happens, if you are anything like me, your instinct may be to go straight to the scene. Safety personnel, though, should immediately rally at the safety office. Quickly gather your team and get your heads on straight, then get right out to the mishap site. Systematically go through the site with a public affairs photographer, documenting everything. Make a journal note for every picture that you personally take, with a comparative object like your hat or a dollar bill in the shot to give scale reference. Otherwise, you will later be looking at several photographs that you do not have a clue of why you took the picture, what the things are in the picture and how big they are in real life. This is even more important when the person who took the picture is not the same person that later is trying to use the picture to analyze the mishap. Determine if anything is not needed for further critical analysis. These things can be released back to owning units if they need them, or at least removed from a mishap site that needs to be re-opened.

If there is ever conflict over assets involved in an investigation, naturally the investigation leadership should speak directly to the owning commander. If a conflict continues, it could be raised to the convening authority for resolution, but I have never needed to do that. After interviewing important personnel such as aircrew in an aircraft mishap, I will make a preliminary judgment call on whether it seems they could have been causal in a mishap. I then like to call up the mishap unit commander and let them know that either we will need to do further investigation with his or her people, or that we would like to still be able to contact them, but are continuing our focus elsewhere. This practice has generally been well received and appreciated. Of course, I never divulge mishap information, much less say whether the people contributed to the mishap, but commanders have to make the tough decision of whether to get their people back out to working the line, or sit them down because they may be a danger to others.

As a commander, getting your people back into work following a mishap can show you have confidence in them and help them recover to be a better person and worker than they ever were before. On a related note, if during an investigation I find major problems that cannot wait for the final report, I will go to the convening authority for something like a one-time maintenance inspection across a fleet of equipment.

Going back to the initial mishap site visit, I will also emphasize that this can be a horrific experience, even if there are not fatalities, just seeing the awesome power that kinetic accidents can impose on people and objects you are familiar with. If people have in fact died, seeing bodies and other effects is almost certainly trauma you will have to help your team deal with. You may walk through wreckage and have a victim’s cell phone start ringing next to your foot, as a family member hears about the mishap and frantically tries to contact their loved one. Ask for help dealing with unexpectedly terrible things like this.

Both begin and end the visit with a big picture look from 50 yards away from the site, looking for major clues that you will not be able to see when your head is down in the weeds. When you first show up to a crash site, you will be anxious to dive in. And when you leave, you will be tired and preoccupied with a million other things. But force yourself and your team to stop as you arrive and depart the site, to look over the area from a distance for at least several minutes. What is the site telling you? These bigger clues can particularly indicate events immediately preceding the final crash. Is there an angle cut through the tall trees on the far side of the area, which would indicate the approach impact angle of the crashed airplane? Is a streetlight several hundred yards away dented, where the mishap vehicle clipped it, before losing control and crashing down the street?
The Power of Safety Investigations

Safety investigators have an enormous amount of authority, but should almost never rest solely upon their power when interacting with others. For one thing, power-hungry people generally do not play well with others. The source of this power is the Secretary of the Air Force’s charter to the service for mishap prevention. Use it when facing rare roadblocks like an organization’s reluctance to give data. It is a good idea to use the investigation’s command authority like the board president, or, if needed, convening authority.

But what I emphasize to safety investigators is if at any point during a safety investigation they think of something that could be useful for them to figure out what happened and what needs fixing, all they have to do is ask. An incredible array of resources can be sourced for them, whether it is an equipment crane to lift wreckage, a Navy scuba dive team, technical experts, material analysis, or anything else they can think of. Investigators should not be limiting themselves based on what they perceive the feasibility or financial cost is of any resource or action. This also applies when making recommendations in the final safety report at the end of the investigation—do not fail to make a recommendation because you think it would be too hard or expensive to implement. Leave it up to the convening authority you work for, to decide whether a resource would be too prohibitively expensive to use in an investigation, or a corrective action would be too difficult to implement. As an investigator, that is not in your purview and that is the commander’s call, not yours. Your focus is to find out what happened and then recommend what would truly, effectively, prevent the mishap from happening again.

Keep in Touch With Commanders of Units Involved in The Investigation

Always let a commander know when you pop into their unit for any questions or to collect records. This may seem obvious, or it may seem trivial for shorter visits. After all, a safety investigation reports to the convening authority, not the unit commander. But just popping your head in their office as a courtesy to let them know you are around shows respect for the commander and their organization, heads off grumpy suspicions of your team prowling around their areas and keeps open a communication pathway that can facilitate better flow of information through the investigation.

Major Chris Dotur has served more than 21 years in the U.S. Air Force. He has been a safety officer for more than 14 years, holding every Air Force safety position from a unit additional duty, to Alaskan regional safety administrator. He has personally investigated 15 major Class A/B incidents of every scope and type around the globe, including as a Safety Investigation Board President. He has authored 18 articles or papers published in professional journals and magazines.
Applications International Corp. Pledges $250,000 to ASSE Foundation

Applications International Corp. (AIC) has pledged $250,000 to the ASSE Foundation over 3 years to strengthen the future of the safety profession by investing in education, leadership development and research.

The donation is a milestone for both organizations—it is the largest charitable gift AIC has ever given and the largest donation ever received in the ASSE Foundation’s 25 year history.

“The ASSE Foundation is overwhelmed with Applications International Corporation’s generosity and commitment to helping our veterans pursue a career in occupational health and safety field,” says Alexi Carli, Foundation Chair. “It mirrors the Foundation’s desire to provide educational and leadership development to advance the safety profession.”

“At AIC, our commitment to excellence goes beyond the high-quality enterprise applications we specialize in providing our clientele. We know that a truly excellent company gives back, making deep investments in others and the future,” says AIC senior account manager Angelica Lauriano.

In 2015, the gift funded six of the Foundation’s Impact Scholarships—one at $15,000 and five at $10,000. You can view the 2015 recipients online.

In addition to funding six Impact Scholarships in 2015, AIC’s landmark gift will provide a $3,000 grant to the Next Generation Board (NGB), the Foundation’s young professionals board. With AIC’s grant the NGB will expand its outreach to ASSE’s student members, encouraging stronger connections and volunteerism within ASSE. Furthermore, $17,000 will be appropriated to Safety Matters, the Foundation’s growth and development fund, which enables the Foundation to continually improve and expand its programs and offerings. AIC’s gift to the Foundation will continue into 2016 and 2017, with allocations to be determined.