
CHAPTER 3

Promoting Meaningful Close-Call Reporting: Lessons from Aviation

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We are on an approach to the airport at 2,000 feet above the ground. The big jet is on autopilot, docile, and responsively following the instructions I have put into the various computer systems. It follows the heading I gave it and stays at the altitude I want it at. The weather is all right, but none too wonderful. Cloud base is at about 1,000 feet; there is mist, drizzle. We should be on the ground in the next few minutes. I call for flaps, and the other pilot selects them for me. The jet starts slowing down. Then we come to the top of our approach. The autopilot does as it was told and nudges the nose of the jet downwards, onto the glide slope toward the runway.

Then something strange happens. The thrust levers that control the power to the jet's two engines move all the way to the back to their idle stop. This is very little thrust for the situation we're in—not enough for keeping the jet aloft much longer. Inside of a split second, my eyes dart up to the computer display with the various mode annunciators, which tells me in what mode the various automatic systems are operating. The autopilot is doing what it's supposed to be doing: riding down the electronically beamed glide slope towards the runway.

The autothrottle, however, is another story. This is the computer that helps control how much thrust goes out of each engine. And it is in a mode that I've never seen in this situation before: fully

retarded. My eyes flutter down onto the display with flight information.

My airspeed is leaking out of the airplane as if the hull has been punctured, slowly deflating like a massive, wounded balloon. It looks bizarre and scary, and it's the split second that lasts an eternity. Yet, I have taught myself in situations like this to act first and question what is going on later. This, I will admit, is against my nature. Deep down I'm probably more an academic than a pilot. Instructors used to remind me to "stop thinking" more than once.

So I act. There's not a whole lot of air between me and the hard ground, after all. I switch off the autothrottle, shove the thrust levers forward. From behind, I hear the engines screech, shrill and piercing. They're still with me and I remind myself to breathe again. The jet responds: Airspeed is picking up, back to where it should be. I switch off the autopilot for good measure (or good riddance) and fly the jet down to the runway. It feels solid in my hands, and docile again. We land. Then everything comes to a sudden standstill. The screens freeze, the world outside stops moving.

We are in a simulator.

"Nice work," the instructor says from his little pedestal behind the two pilot seats. I turn

around and smile at him, knowing that he knows what I know.

At that very time, I was helping to investigate the accident on which the scenario was based. A big jet crashed short of the runway because, in a one-in-a-million chance, the autothrottle was tricked into a wrong mode by some rare indication failure of the airplane's altimeter system. The radar altimeter erroneously told the autothrottle that the jet was on the ground (even though, pertinently, it *wasn't*) and that it was time to retard the thrust levers, to pull the power. The autothrottle computer never bothered to tell the autopilot about its brilliant intentions, however. The autopilot was happily doing its thing by riding down the glide slope to the runway, blissfully unaware that the other computer system had just robbed it of the only factor responsible for being able to fly at all: airspeed. None of the books about this jet available to pilots ever revealed this possibility. As far as pilots were concerned, it was an unknown unknown.

So I wasn't all that impressed with my own bravado, mind you. What did impress me, however, was the fact that I was sitting in a simulator, for one of the regular four-hour proficiency sessions that I need to do several times a year to keep my license valid, and here it was: The scenario that killed a bunch of people in the same jet but in another part of the world was being played through our flight, into our hands and minds. The official accident report wasn't even out yet, but plenty of pilots had realized that this could be really hazardous and decided to do something about it. For themselves, their colleagues, everybody. Now that's *double-loop learning*.*

Yet, the accident revealed both the strengths and the weaknesses of learning from failure in this particular industry, aviation. Because, you see,

there had been trouble with radar altimeters on this kind of jet before. After the accident, it turned out that some pilots in the same airline, as well as in other airlines, had sometimes experienced funny things with the radar altimeter. Spurious warnings about proximity to the ground would be triggered, for example. In some cases, even the autothrottle would go into the wrong mode. But the failures would never repeat themselves on the next leg of the trip. They were impossible to recreate on the ground.

Engineers had no idea. Pilots did not write it up. These things were not seen as close calls at the time. If an unknown is unknown, then the symptoms of its trouble may go unrecognized; any symptoms may get rationalized as the necessary, unavoidable noise generated by a complicated system. Hey, we landed without incident, right? No harm, no incident. No close call, no report. No signal is seen among the noise. This is one of the biggest challenges: How do we decide what counts as bad news? What is "near" enough to a bad outcome to count as a close call? Social systems are expert at adapting their readings of risk to accommodate the seemingly normal and leave intervention only for the patently hazardous. Norms for what counts as risky get renegotiated all the time, particularly as operational experience with a particular system, particular procedure, or particular failure mode (or disease) accumulates. It is the kind of normalization of deviance ("Oh, we've seen this before, it's OK.") that eventually brings space shuttles down in flames.^{1,2} If it's okay, it's not a close call. It will remain unknown as risky to everybody else. It is not strange that underreporting of adverse events in health care has been estimated to be between 50% and 96%,^{3,4} even though this assumes a "norm" that can be agreed on about what constitutes an event relative to which people underreport. This is tricky.

*Single-loop learning constitutes adaptive learning; double-loop learning is reflection in and on action; and triple-loop learning is meta-learning.

RECONCILING THE HYPOTHESIS OF INFALLIBILITY WITH THE INEVITABILITY OF MISTAKES

It has been said that infallibility is the medical profession's working hypothesis. Lucien Leape, in reflecting on human error in medicine in 1994, stated the following:

The most important reason physicians and nurses have not developed more effective methods of error prevention is that they have a great deal of difficulty in dealing with human error when it does occur. The reasons are to be found in the culture of medical practice. Physicians are socialized in medical school and residency to strive for error-free practice. There is a powerful emphasis on perfection, both in diagnosis and treatment. In everyday hospital practice, the message is equally clear: mistakes are unacceptable. Physicians are expected to function without error, an expectation that physicians translate into the need to be infallible. One result is that physicians, not unlike test pilots, come to view an error as a failure of character—you weren't careful enough, you didn't try hard enough.^{4(p. 1851)}

There is nothing wrong with striving for perfection, of course. It is consistent with the idea of medicine as a vocation, a calling, rather than just normal technical work. As Charles Vincent pointed out for medicine:

Those working in this environment foster a culture of perfection, in which errors are not tolerated, in which a strong sense of personal responsibility both for errors and outcome is expected. . . . With this background it is not surprising that mistakes are hard to deal with, particularly when so much else is at stake in terms of human suffering.^{5(p. 142)}

Failures, then, can get to be regarded as non-existent anomalies in the system. This makes them,

in principle, not reportable; they cannot be talked about for what they are. The existence of a "hidden curriculum,"⁶ which teaches medical students and residents a repertoire of actions and vocabulary of phrases to deal with the inevitable imperfections of medical practice, is another example of this culture. But there is a contradiction here. Almost everybody in health care will readily acknowledge that "nobody is perfect, you will make an error occasionally although you take all precautions to avoid it."^{7(p. 192)}

So how do we reconcile infallibility as a working hypothesis with the inevitability of mistakes? There are at least two ways, neither of which encourages reporting of close calls. The first way is by invoking incompetence—either remediable clinical inexperience or irredeemable unsuitability for the profession.⁸ In the first case, the person involved in a close call was considered not good enough (yet) and still had a lot to do to achieve levels of perfection. It causes a senior practitioner to counsel, help, direct, or take over altogether. There is the expectation that the frequency of such events decreases as time goes on and as the individual's experience accumulates. Again, infallibility could be preserved as a working hypothesis. Achieving it just gets pushed into the future a bit.

If the individual did not discharge role obligations diligently and created unnecessary extra work for colleagues, then his or her performance would be considered normatively erroneous. Bosk found how senior surgeons continuously make assessments about whether the person making the mistake actually has any business being in the profession in the first place.⁸ Mistakes got implicitly classified in these assessments, with different repertoires of action appended to them. The more such normative errors a person was seen to make, the less likely it would be that he or she would retain employment within that surgical service.⁸ Infallibility could be preserved here, too, because it was a matter of particular individuals not belonging in

the profession or in that particular specialty or service (the person may have lacked the “calling”). To the extent that errors are the result of inexperience and lack of exposure, the solution is simply more training and more exposure. But if close calls are judged to result from the individual’s fundamental unsuitability for the profession, then there is nothing systemic or deeper about the error that is interesting to probe. The source of failure lies with the individual, and the solution is not to have the individual practice in that specialty or service.⁸

The other way in which the inevitability of mistakes can be reconciled with infallibility as a working hypothesis is to blame bad luck—arising from a particular set of circumstances: “People don’t start off to harm a patient, it just happens.”^{7(p. 192)} In this case, the close call can be said to be something external, something accidentally imported through happenstance or bad luck. If a close call is ascribed to a highly unusual set of circumstances, then there is not much reason to reflect and probe and learn, either. The rationalization is that this particular set of circumstances (anatomical, physiological, operational, team-composition, organizational, and so forth) will not likely repeat itself in exactly this way, so there is little value in trying to predict and prevent it from creating trouble again. Indeed, it is not very useful to share any lessons from that particular encounter with those circumstances with colleagues, either, because they will not likely meet those circumstances, and in the end errors are inevitable anyway: “If mistakes are seen as inevitable and a matter of bad luck arising from a particular set of circumstances, then this implies that attempting to learn from other people’s mistakes (and by implication, reporting those mistakes) is not regarded as a valuable exercise.”^{7(p. 194)}

These various repertoires of reconciliation have a consequence for the ability of the medical profession to reflect seriously on mistakes and learn from them. Critical reflection on safety and

error is not a taken-for-granted feature of the professional identity of people working in health care. This makes it hard to legitimize the reporting and discussion of error. It is even harder to deal meaningfully with the personal consequences of having made an error. Leape called this a paradox:

The paradox is that although the standard of medical practice is perfection—error-free patient care—all physicians recognize that mistakes are inevitable. Most would like to examine their mistakes and learn from them. From an emotional standpoint, they need the support and understanding of their colleagues and patients when they make mistakes. Yet, they are denied both insight and support by misguided concepts of infallibility and by fear: fear of embarrassment by colleagues, fear of patient reaction, and fear of litigation. Although the notion of infallibility fails the reality test, the fears are well grounded.^{4(p. 1852)}

REPORTING SYSTEMS: VOLUNTARY, NONPUNITIVE, AND PROTECTED

So how do other fields do it? Reporting systems are alive and well in aviation, in nuclear power generation, in many military applications, in petrochemical processing, and in steel production. Let’s discuss just two of them here. Safety is very much a part of the professional identity of airline pilots and nuclear power plant engineers. It may have something to do with the subtle fact that they will be the first at the site of an accident. And that any accident may take their lives too. This tends to focus the mind. The potential for reflection is present. The cultural, professional, and practical dispositions to do so are present as well. But more is necessary. Close-call reporting systems that actually work do a couple of things really well. They are nonpunitive. They are protected. And they are voluntary.⁹

Let's start with the last one, having a voluntary system. Why is that any good, leaving it to people's own judgment to report or not? There is a very simple reason: Having a mandatory system makes no sense. If reporting a close call is mandatory, then practitioners will smoothly engage in various kinds of rhetoric or interpretive work to decide that the event they were involved in was not a close call. Having a mandatory system would probably increase the putative underreporting rate in medicine even more. And making reporting mandatory implies some kind of sanction if something is not reported. Which destroys the first ingredient for success: having a nonpunitive system.

Nonpunitive means that the reporter is not punished for revealing his or her own violations or other breaches or problems of conduct that might be construed as culpable. This is normally seen as hugely problematic, particularly in medicine. As Leape pointed out, "this kind of thinking lies behind a common reaction by physicians: 'How can there be an error without negligence?'"⁴(p. 1851) The infallibility hypothesis indeed leaves few alternatives. Close calls that cannot be constructed or rationalized away as remediable or irredeemable incompetence or bad luck (and thus might actually be reported) have to be due to some potentially culpable omission or act. However, not punishing that which is reported makes great sense, because otherwise it would not be reported. This creates a dilemma, of course, for those receiving the report (even if via some other party, such as a quality or safety staff member). They want to hear everything that goes on—but cannot accept what goes on. Yet if they make very clear that they will not stand for some of the things that get reported, these things will quickly cease to be reported. This is a delicate balance. One voluntary report about an adverse medication event, for example, ended up in the media. The nurse who had reported it was identified, found, charged with a crime, and convicted.¹⁰ The willingness to report anything by any other nurse would have taken a

severe beating. From the position of a manager or administrator, the best way to manage this balance is to involve the practitioners who would potentially report (not necessarily the one who did report, because if it is a good reporting system, that might not be known to the manager). What is their assessment of the "error" that was reported? How would they want to deal with a colleague who *did* such a thing? In the end, whether an "error" is culpable is not about the crossing of some clear line that was there before the error. Whether an act or omission is reckless or negligent is a judgment, and often a difficult one, that somebody will have to make. Perceived justness often lies less in the decision than in who is involved in making that decision. For a manager, keeping the dialogue open with his or her practitioner constituency must be the most important aim. If dialogue is killed by rapid punitive action, then a version of the dialogue will surely continue elsewhere (behind the back of the manager). That leaves the system none the wiser about what goes on and what should be learned. I will say more about the effects and difficulties of a nonpunitive system at the end of the chapter.

Finally, successful reporting systems are *protected*. This means that reports are confidential rather than anonymous. What is the difference?

Anonymity typically means that the reporter is never known, not to anybody. No name or affiliation has to be documented anywhere.

Confidentiality means that the reporter fills in name and affiliation and is thus known to whomever gets the report. But from there on, the identity is protected, under any variety of industrial or organizational or legal arrangements. If reporting is anonymous, two things might happen quickly. The first is that the reporting system becomes the garbage can for any kind of vitriol that practitioners may accumulate about their job, their colleagues, or their hospital during a workday, workweek, or career. The risk for this, of course, is larger when there are few meaningful or effective line management

structures in place that could take care of such concerns and complaints. However, senseless and useless bickering could clog the pipeline of safety-critical information. Signals of potential danger would get lost in the noise of potent grumble. That's why confidentiality makes more sense. The reporter may feel some visibility, some accountability even, for reporting things that can help the organization learn and grow. The second problem with an anonymous reporting system is that the reporter cannot be contacted if the need arises for any clarifications. The reporter is also out of reach for any direct feedback about actions taken in response to the report. The NASA Aviation Safety Reporting System (ASRS) recognized this quickly after finding reports that were incomplete or could have been much more potent in revealing possible danger if only this or that detail could be cleared up. As soon as a report is received, the narrative is separated from any identifying information (about the reporter and the place and time of the incident) so that the story can start to live its own life without the liability of recognition and sanction appended to it. This recipe has been hugely successful. ASRS receives more than 1,000 reports a week.¹¹

CLOSE-CALL REPORTING IN AVIATION IN PRACTICE

Months after the proficiency check in the simulator I meet Jack, the safety manager of another airline. Jack is going to tell me about close-call reporting and how it helps safety in his organization.

We sit in a small office in a single-story building. The office is in a corner, with windows on one side looking straight into one of the airport's ramp areas. Airliners are pulling in just outside, almost nudging their nose into the roof of the little building as they slide into their parking spot. Diesel trucks and electric buggies and lifts and stairs of all sizes and shapes start milling around the fuselage and wings and engine pods, jostling for space like worker bees tending to

their queen. The windows of Jack's little office are powerless to stop the noise and the smells from jet engines and auxiliary power units and from coming through. The airport, aviation, movement, people, hazard, risk—they all make their presence known continuously in this little office, thundering through the glass panes, wafting and seeping through the cracks. This is way beyond immersion in the field. Here, the operational world is simply inescapable. The point of why a safety man is sitting here is firmly within any observer's grasp.

"What about the unknown unknowns?" I ask. I explain the accident sequence involving the indication failure of the altimeter system to him. Jack knows it, of course. Then he shrugs and shakes his head. "If our pilots or other operators don't recognize something as bad news, it's not going to make it into the system," he acknowledges.

We are silent for a little bit. Then Jack inhales audibly. "Here's our system, let me show you," he says, swiveling towards a computer terminal on a narrow black table. A few mouse clicks later he has taken me to the outer layer of the close-call reporting system: the first screen on which you, me, anybody from the company or any of its suppliers or subcontractors can make a selection about what kind of report to file. There's a bewildering list. Flight safety reports, cabin safety reports, hazardous materials reports, bird strike reports, maintenance safety reports, and more, all indicated in acronyms and abbreviations bubbling from top to bottom on the screen.

"Which would you like to see?" Jack asks. We choose an FSR, a flight safety report. More clicks. A new window opens; fields appear, beckoning my fingers to go to the keyboard to start typing. Some fields are mandatory, such as where was the flight going? What is the aircraft type?

Then there are optional fields. What phase of flight? What was the weather like? We type, make things up. Just to see how this works.

Then we come to the ultimate display in the system—the space for the narrative about the close call. From this display, a large white field is staring blankly back at me, daring me with its invitation for free text. I can imagine that people who have never learned to tell stories, or to type, for that matter, may feel a bit intimidated. Where to start? Should you follow the chronology? Begin with a presumed cause of trouble, or conclude with that? There is no filter between what is typed here and what gets seen at the other end of the system (which, really, is Jack). So what goes in comes out. The whole narrative may even make it to a safety review meeting or to management.

CLOSE CALLS AS NARRATIVES OR NUMBERS?

In a sense, it is good that Jack gets the “garbage” that his pilots type in directly, because a lot of other close-call reporting systems use indexing systems. These are not automatic but rather are tools used by staff (like Jack) to chop the narrative up into categories. They allow information from the close-call database to be presented numerically and graphically and to be compared across space or time (as in “we have so many of these so-and-so incidents with this or that technology compared with only so many last month or compared with only so many in our sister hospital across town”). Often, managers get to see nothing *but* such bar charts or pie charts or number tables in the hope that it would present them with some actionable information.

It probably does not. At least not often. The whole point of the narrative is the narrative. Outside of the story, there is no close call, there is no incident. There is no build-up, no context, no resolution, only dead remnants arbitrated by somebody who was not there when it happened, classified remains that have been lobotomized out of the living story from which they came. This limitation, and the finding that classification should not be confused with analysis, was

noted, as follows, in 1998—when initial enthusiasm for reporting was building in health care³:

Classification does involve a type of analysis but a type that greatly constrains the insights that can be obtained from the data. Typically, when classification systems are used as the analysis, a report of an incident is assigned, through a procedure or set of criteria, into one or another fixed category. The category set is thought to capture or exhaust all of the relevant aspects of failures. Once the report is classified the narrative is lost or downplayed. Instead, tabulations are built up and put into statistical comparisons. Put simply, once assigned to a single category, one event is precisely, and indistinguishably like all the others in that category. Yet research on human performance in incidents and accidents emphasizes the diversity of issues and interconnections. . . . Capturing a rich narrative of the sequence and factors involved in the case has proven essential. Often, new knowledge or changing conditions leads investigators to ask new questions of the database of narratives. The analyst often goes back to the narrative level to look for new patterns or connections.^{12(p. 41)}

Categories force analysts to make decisions, to draw lines. To decide that an action or circumstance is *this* but not *that*. What if it is both? Or neither? Attempts to map human capabilities such as decision making, proficiency, or deliberation onto discrete categories are doomed to be misleading, for they cannot cope with the complexity of actual practice without serious degeneration.¹³ Classification disembodies data. It removes the context that helped produce the close call in its particular manifestation. This disables understanding because by excising performance fragments away from their context, classification destroys the local rationality principle. This has been the fundamental concept for understanding—not judging—human performance

for the last 50 years: People's behavior is rational, if possibly erroneous, when viewed from inside their situations, not from the outside and from hindsight.

The local rationality principle also reminds us that the consequences of actions are not necessarily well correlated with intentions, yet this evaporates in the wake of close-call classification. It is important to note that the point in learning about close calls is not to find out where people went wrong. It is to find out why their assessments and actions made sense to them at the time, given their knowledge, goals, tools, and resources. For we have to assume that if it made sense to someone (given the background and circumstances), it will make sense to someone else, too, and the close call will not only repeat itself but perhaps not remain a close call the next time. Controversial behavior can be made to make sense (be understood) once resituated in the context that brought it forth.

After the observation of a close call is tidily locked away into some category, it has been objectified, formalized away from its context. Without context, there is no way to reestablish local rationality. And without local rationality, there is no way to understand human error. Classification probably presents managers and administrators, and possibly even practitioners, with an illusion of understanding. It disconnects human agents' performance from the context that brought it forth and from the circumstances that accompanied it, that gave it meaning, and that hold the keys to its explanation.

There is another organizational side effect of collecting close-call reports. It may feed the illusion that safety management is really "unsafety" management, that effective intervention consists of getting rid of the "bad stuff." But safety is more than the measurement and management of negatives (close calls), if it is that at all. There is little or no evidence that "safety" as such actually exists, independent of workers' minds or their

surrounding culture. Research has shown instead that safety is more a "constructed human concept"^{14(p. 1550)} and has begun to probe how individual practitioners construct safety by assessing what they understand risk to be and how they perceive the difficulty of managing challenging situations.¹⁵ Interestingly, Orasanu discovered a mismatch between risk salience (how critical a particular threat to safety was perceived to be by the practitioner) and frequency of encounters (how often these threats to safety are in fact met in practice). The safety threats deemed most salient were the ones least frequently dealt with.

Given these results, it is no wonder that good empirical indicators of social and organizational definitions of safety are difficult to obtain. According to Rochlin, the description of what safety means to an individual is a part of that very safety, and is dynamic and subjective: "Safety is in some sense a story a group or organization tells about itself and its relation to its task environment."^{14(p. 1555)} Clearly, such aspects of safety can only be captured by a less categorical, numerical approach. An approach is required which probes the interpretative aspect of human assessments and actions. For that, what we need are narratives about close calls, which can be as much stories of how things went wrong as stories about how things (which could have gone wrong) went right after all. They can be stories of resilience, in other words. Stories of how a system of people and technologies was able to recognize, absorb, and adapt to changes and challenges that perhaps fell outside what the team was trained or designed to handle.¹⁶

This aspect of close-call reporting is instructive even for the managers or administrators who may see themselves at the consuming end of the system. Resilience is created when people engineer extra margin into their operations, the kind of slack that allows them to adapt under pressure and accommodate surprise and that allows them to extemporize and accommodate the fluctuating pressures and tasks of actual work. Resilience

is created when (1) people keep a discussion about risk alive even when everything looks safe; (2) teams and organizations have institutionalized the courage to show dissent independent of rank or status, to say “no” or “stop” even in the face of acute production pressures; and (3) past successes are no longer seen as an automatic guarantee of future safety. Such creation of resilience applies across scales and levels—resilience can and must be created throughout hierarchies—not just at the sharp end.

Nonetheless, the idea that close-call reporting is simply about counting negatives, presented to management and administrations in the form of various graphics, may be compelling to the health care industry for the same reasons that any numerical performance measurement is.

“Why not find a story of the month?” I asked Jack. Rather than presenting numerics, select a story to tell management. Human memory is made for stories, not numbers. Jack thinks this could be good idea. However, numbers are compelling to Jack’s managers, too. “You see,” he says, after another frenzy of mouse clicks and screens that flash open and close, “this is how we can generate statistics.” He shows me a list of crude incident counts. So much of this kind, so much of that. A little table of categories with hit rates next to them. I begin to see how the quantification of close-call results helps assert the existence of an observer-independent reality. The quantified results are an objective window into this reality that can be offered to managers, with the illusion that here is a world that they can affect, influence, mold, shape, control, and understand without having to take some analyst’s word for it:

The use of figures and graphs not only embodies numbers, but gives the reader the sense of “seeing the phenomenon.” By using figures and graphs the scientist implicitly says, “You don’t have to take my word for it, look for your self.”^{17(p. 56)}

What is finessed here is what the numbers stand for to begin with and how they were arrived at. Confidence about where to intervene is reduced to a kind of ranking or numerical strength, a sort of democracy of numbers. The problem, of course, is that managers in this case *do* take the analysts’ word for it. It was an analyst, after all, who decided to put some things into some categories and others into other categories. This, however, as well as the rationale for it, has disappeared entirely by the time the numbers show up in the boardroom.

I don’t say anything of the sort to Jack. He is now busy explaining to me how he is working with his programming colleague to force the user to enter his or her flight numbers in a particular way and to make sure that he or she uses an acceptable format for the time of the incident (“So you can’t do, say, ‘6:00 P.M.’ but have to write 18:00:00, and of course in UTC [Coordinated Universal Time], not local”). I nod dutifully but wonder who is doing the analysis while he is sitting there worrying about input values. Who’s learning from failure now? There’s nobody else in the office. I conclude that collection is easier than analysis. And that analysis is easier than taking meaningful action. And that taking meaningful action is still a bit removed from preventing an accident.

Gathering reports is only the beginning. The enthusiasm with which we encourage people to report is seldom matched by our ability to do anything meaningful *with* the reports—so that people will stay encouraged to report in the future. Close-call classifications easily become the stand-in for analysis, real understanding, and actionable intelligence. Classification alone can be seen as a sufficient quantitative basis for managerial interventions. Pieces of data from the operation that have been excised and formalized away from their origin can be converted into graphs and bar charts that are subsequently engineered into interventions. Never mind that the bar charts show comparisons between apples and

oranges (for example, causes and consequences of a close call), which lead managers to believe they have learned something of value. It may not matter because managers can elaborate their idea of control over operational practice and its outcomes. The real world is not so easily fooled: Managerial “control” exists only in the sense of purposefully formulating and trying to influence workers’ intentions and actions.¹³ It is not at all the same as being in control of the consequences (by which safety ultimately gets measured health care-wide)—the real world is too complex and operational environments too stochastic.¹⁸ Numbers that may seem managerially appealing are really quite sterile, inert. They do not reflect any of the nuances of what it is to “be there,” doing the work, creating safety on the line. Yet, this is what ultimately determines safety (as outcome): People’s local actions and assessments are shaped by their own perspectives—self-referential, embedded in histories, rituals, interactions, beliefs, and myths, both of their organization and themselves as individuals.

This is also a reminder that the collection of close-call reports is only the starting point. The number of reports collected, or the increase in such numbers, is often seen as a reason to celebrate the success of the system. But this is not the success. Close-call reporting is only a means to an end, not the end itself. One of the most important ways in which close-call narratives, in all their cultural, historical, and mythical richness, can contribute to learning by other people closely involved with the safety-critical processes is by integrating them into recurrent training. This is what happens in the aviation industry. Mandatory yearly crew resource management training that focuses on the soft skills (communication, interaction) for producing safe, successful outcomes can benefit hugely from the review of and critical reflection over cases from people’s own operational environment. That is one place where the loop from close-call report to organizational learning can be closed—perhaps more effectively than with a pie chart beamed up on the wall during a management meeting.

Jack shows me other ways in which the learning loop gets closed. “I assign a risk factor to each incident,” he says. Depending on the severity of the risk that he assesses it to be, the incident gets bumped up into the organization. The risk factor can also be renegotiated in such subsequent meetings. All risk control measures that are proposed after an incident has been bumped up have to be approved by the safety department. That would be Jack. Jack closes the loop.

I can’t help but think of the normalization of deviance. The various manufacturers also are linked into the system, Jack explains. Not that they can see full reports, but they get numeric results about their equipment, so that they can see how well their stuff is doing and where the weak spots are. And again, I think about the unknown unknowns. No matter how well you are linked in, it won’t matter much if the people who put the information in don’t know what to look for, and if you don’t either.

“What about the regulator?” I ask. “They get to see all reports,” Jack adds, “with identifying information.” The country out of which his airline operates clearly allows such openness: There is trust that the reports (and particularly the reporter) are not abused for what they (or the reporter) reveals.

WHO GETS TO KNOW ABOUT YOUR CLOSE CALL?

This is a particularly interesting question. How can people trust that their reports will not be used against them? What kinds of protections are fair? And will such protections not lead to the abuse of the close-call reporting system for accountability (rather than learning) purposes it was never intended to support? I think back to an incident in which I myself was a player.

The incident was minor: The landing-gear doors opened up on climb-out (in which the aircraft climbs to a predetermined cruising altitude after

take-off) because of the ergonomics of the gear handle (which makes pulling it too far down very easy). However, we knew that this little event would show up on the automatic flight data recording system of the aircraft. Because gear doors are not supposed to open on climb-out, it would probably show up red or otherwise marked. Modern aircraft have an electronic store of astounding capacity that records up to hundreds of data points every second. The electronic footprint that each flight leaves as a result is huge, probably larger than the total electronic memory of the entire world during the closing days of World War II. We knew that if this little event showed up and we did not report it as a close call, then we might get questions—either from the equivalent of Jack or from the chief pilot, who oversees the operation of his fleet. It was close to midnight when we got back to our base airport. We decided to write a report.

My colleague went at it first. He opened the appropriate window on the computer terminal in the deserted crew room but was clearly not used to typing or to creating a narrative, or even to forming words or phrases that would carry what his meaning. After seeing him hunt and peck at some keys, only to repeatedly delete the painfully produced letters not much later, I gently nudged him out of the way and then we stood there. The soft buzz of fluorescent lights in the ceiling overhead was the only life left in the crew room besides us—two bleary-eyed guys trying to compose a text that would say enough, but not too much. A text that would explain but not incriminate.

My fingers hovered over the grimy keyboard until they finally exploded into a feverish typing. When I stepped back and viewed the end result with my colleague, we saw that it had become a set of phrases and wordings that fulfilled the purpose of exculpating ourselves more than it would help the organization become stronger or smarter or better or safer. It wasn't our fault, you know, and we really thought we were being good

boys by volunteering our side of the story, thank you very much. My colleague thought it was a good narrative.

This, indeed, is the risk of close-call reporting. For some cases, the reporting system can become a liability management device more than an instrument for collective learning and organizational safety improvement. The system does not get a whole lot wiser, but at least we, the operators, get better protection against any consequences of our actions. I marvel at my own susceptibility to this inversion of intentions. On the way out of the crew room to the darkened parking lot, I tell myself that I should know better—that I should write reports that help the airline and everybody else, not me. Or at least not primarily me. But then, I have it easy. I have the chief pilot's ear any day. If I have a concern, I'll tell him. The incident with the gear doors I wouldn't even tell him about. It's because of the possible anomaly that would show up in the flight data recording that I felt compelled to send something in. But I could hardly call it a concern. The incident was so minor, after all . . . which, I realize, is what we all say until it contributes to something no longer so minor.

I later saw a medical colleague who lamented the lack of close-call reporting at his hospital. "People don't realize that they should be reporting this sort of stuff," he said. "That's the only way we can discover the weak spots before they become really dangerous." The way he talked about it, I started to understand that a close call in his hospital was considered much more a "miss" than anything "near." If it's a miss, it's a nonevent. And if it's a nonevent, there is nothing to report. Standard procedure at his hospital? Wipe the brow, say, "Whew, we got away with that one," then peel off the gloves and go home.

I now look back differently on my *non-mea-culpa* story, whipped into that grungy computer terminal the night of the gear-door event. Whatever our motive, whatever our motivation,

the story at least made it into the system. The close call was on record now. Perhaps it was better to send in an exculpatory “don’t-blame-me-I-was-only-behaving-like-a-boy-scout” story than not sending in anything.

We’re back in Jack’s little corner office. The row of windows that doesn’t look out onto the ramp offers a view of something decidedly inglorious: a garbage dumpster. It says *FOD* on it, or Foreign Object Damage—stuff that can get sucked into jet engines and create all kinds of havoc. This can be anything from baggage labels to baby stroller parts to food cartons. The ramp must be clear of it, and a slew of garbage dumpsters is provided for anything found there by anybody. After an aircraft has taxied in and shut down close to the office, a man lumbers over to the dumpster, grey bags slung over each shoulder. Jack and I watch him as he hauls the bags into the dumpster. Whatever he just threw in there, it is not FOD by any stretch. This is garbage from the aircraft that just taxied in. I suppose it had to go somewhere, that the airline got tired of paying for any other means.

The dumpster lid bangs closed and the man walks back out onto the ramp. I see Jack looking after him and can’t help but wonder if Jack sees the same analogy. Here, in his little corner of the airport, is a place where the dirty laundry of the airline, its garbage, its detritus can end up. Where all the bad news collects. Where it can get stored and taken care of, safely and securely. And where we can begin the process of recycling it into something productive.

WHAT ARE THE LESSONS FROM AVIATION?

The lessons from aviation for meaningful close-call reporting can be summarized as follows:

- Close-call reporting is critical for the creation of a safety culture. Incidents represent “free” lessons that can be used to discover and change unsafe conditions.

- Successful close-call reporting systems are confidential, nonpunitive, and protected. *Confidential* means that the reporter is known only to one or a few trusted people who have no say over possible sanctions. *Nonpunitive* means that the reporter cannot be blamed for something that becomes known only through the close-call report. *Protected* means that stored close-call data are not accessible by outsiders.
- Setting targets for close-call reports is useless. Measuring the number of reports as an indicator of greater or lesser safety is hugely unreliable, in part because the denominator will always be unknown (underreporting remains rife in health care).
- Reporting close calls is easier than analyzing close calls. And analyzing them is easier than changing processes or behaviors in the organization.
- A close-call reporting system is only a start. Considerable investments in analytic expertise and resources are necessary, as is the assurance of influence at relevant decision-making levels in the organization. Only then can an organization exploit the full potential of close-call reporting.

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