



# Just culture: A case study of accountability relationship boundaries influence on safety in HIGH-consequence industries <sup>☆</sup>



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## ABSTRACT

In high-consequence industries the desire of many managers to “hold someone accountable” for errors remains a barrier to advancing meaningful safety agendas. The misconception that clear lines of accountability can and do exist, and that employees who cross the line between acceptable and unacceptable behavior should be punished, fails to recognize the different types of accountability relationships negotiated by employees every day. Such judgments run counter to the concept and practice of a just culture. Examination of the four types of accountability relationships, potentially seen within any just culture - hierarchical, legal, professional, and political, reveal the potential for the lines of accountability to frequently blur. This opaqueness is seen in numerous accidents which reveal the conflicting effects employees in high-consequence industries face as they move between and across these accountability boundaries. We use a case study, as a glimpse into the world of practice of aviation to illustrate the conflict, and double- binds, created as those in high-consequence industries negotiate the fluid lines of accountability relationship boundaries. This germane example is the crash of Swissair Flight 111, near Halifax, Nova Scotia, in 1998. Here we offer dialogue to aid in understanding the influence accountability relationships have on safety, and how employee behavioral expectations shift in accordance. We propose that this examination will help redefine accountability boundaries that support a just culture within dynamic high-consequence industries.

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## 1. Introduction

In high-consequence industries, employees in safety sensitive positions work in vastly complex sociotechnical systems. In order to maintain safe levels of operations they utilize various skill sets, including those that are both cognitive and communicative. However, employing these skills is not enough, maintaining a common operating picture, or shared mental model of rapidly changing safety conditions requires successful collaboration. This collaboration, includes all human interactions in addition to those between machines and humans. Within these systems, employees must regularly negotiate to whom they are accountable, and under what type of accountability relationships those negotiations occur. Dekker and Pitzer (2016) point out that “accountability relation-

ships can encourage suppression of the ‘bad news’ necessary to learn and improve” (p. 57).

Commonly, the challenges facing operators in dynamic high-consequence industries is that the lines of accountability are not “clearly drawn” but are yet, in hindsight, defined thus to assign “blameless and/or blameworthy actions” or culpability. Increasingly there is “tremendous pressure by the public, the media and politicians to identify the blameworthy parties and hold them accountable” (Michaelides-Mateou and Mateou, 2016, p. 69). Across the legal accountability line, “the criminalization trend over the last fifteen years has exposed a lack of global uniformity of how and where the line between honest professional mistake and criminalization is drawn” (Dekker, 2009a, p. 61). Since these lines are based on hieratical, legal, professional, and political accountability relationships, and therefore are not static, employees in safety sensitive fields must negotiate moving between and across the lines each day as they strive to mitigate risk. To the contrary, the accountability relationships that govern our lives are not only complex – because we must answer to a variety of others under a variety of ground rules – but often fluid and dynamic – as each party in

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the accountability relationship learns to anticipate the reactions of the other” (Tetlock, 1985, p. 256). Moving between accountability relationship boundaries “practitioners must cope with the presence of multiple goals shifting between them, weighing them, choosing to pursue some rather than others, abandoning one, embracing another” (Woods, 2004, p. 13). They must balance sharing enough information to support learning from mistakes, while at the same time protecting their own interests as they move across the boundaries of hierarchical, legal, professional, and political accountability relationships. Accountability relationship boundaries influence safety culture and organizational resilience as key enablers for effective safety management (Schwarz et al., 2016).

These challenges are not made in isolation but rather as a significant component to how collaborative work is accomplished in dynamic high-consequence industries. Because of these considerations, in addition to the natural complexity of work, promoting safety through *just culture* is not a simple call for “no blame” – but rather a broader understanding that redefines the boundaries of accountability relationships and recognizes employee movement across those boundaries, including all the challenges that may occur. Rather than assume there are no bad actors, or people with ill will, we accept that they too must operate within these accountability relationship boundaries. While many have discussed safety accountability lines, “who gets to draw the line,” “clearly defined” or fluid, few have applied such study to the accountability relationships, and how movement between and across accountability boundary lines influences decisions for those at the sharp-end of safety (Dekker, 2007; Marx, 2001; Romzek and Dubnick, 1987).

This case study of Swissair111, delves into how operators, negotiating between and across accountability boundary lines, have the potential to improve collaboration in hierarchical, legal, professional, and politic accountability relationships, that may well enhance error reporting. The case of Swissair111 also offers an opportunity to explore how conflict is created as operators negotiate priorities, based on these accountability relationship boundaries, that influences safety decision-making still today. Our goal, through this case study, is to aid in peeling back the accountability layers to reveal how accountability relationship boundaries either contribute to, or inhibit, advancement of *just culture* in high consequence industries during abnormal events. By exploring further where abnormal events occur in these safety sensitive industries, some accountability relationships may shift and morph to meet the demands of the situation. Through increased awareness of the movement between accountability relationships practitioners, and operators alike, can better prepare for not only the technical challenges of these events, but also the social relationship and accountable boundaries that may shift in response to the current demand.

## 2. Just culture in safety science

Safety is a continually evolving process of finding what makes organizations in high-consequence industries resilient, understanding their margin of safety, and what puts them at risk. The concept of *just culture* supports organizational safety resilience by promoting an environment of openness that encourages reporting and learning from mistakes, free from fear of reprisal. *Just culture* emerged from the study of organizational cultural influences on sociotechnical systems safety.

Historically speaking, the evolution of safety studies into accident causation can be divided into a number of stages throughout time, each building on the previous stage and representative of the cultural norms present in Western thinking during that period.

Early safety theories during the technical stage, focused on mechanical failures as explanations, since the previously held belief structure of “Acts of God” were no longer satisfying as explanatory offerings. The industrial revolution in Western culture drove more dependable, productive, and powerful forms of mechanical devices, from which new forms of accidents and attributable causation emerged. As mechanical reliability improved the focus expanded into assuming that human error played a role in accident causation. Regulations, policies, and procedures were implemented to reduce the threat of human errors, in part through a hierarchical or bureaucratic system of accountability based on deterrence through sanctioning. Eventually, along with greater understanding of human error, came an increased awareness of the influence of ergonomics, organizational culture, and systems as factors contributing to errors and failures within complex sociotechnical systems.

Following the 1986 Chernobyl nuclear power plant accident, emphasis was placed on how the culture of organizations contributes to accidents. This call for advancing safety culture, included subcultures, outlined by Reason (2000a) as an informed culture sustained by a reporting culture, (founded on a *just culture*) supported by a learning culture that functions as a flexible culture.

The complete absence of such a reporting culture within the Soviet Union contributed crucially to the Chernobyl disaster. Trust is a key element of a reporting culture and this, in turn, requires the existence of a *just culture*—one possessing a collective understanding of where the line should be drawn between blameless and blameworthy actions. Engineering a *just culture* is an essential early step in creating a safe culture.

[(Reason, 2000b)]

This statement echoes Marx’s (1997) earlier call for a collective understanding of the culpability line after a mishap, and where human error had been identified as the cause, could be divided into three subsets:

- Errors with associated unintentional rule violations.
- Errors with associated intentional rule violations.
- Errors with associated reckless behavior.

Despite his crafting and support of these categories during investigations, Marx acknowledged that “even under the best of circumstances, human reliability will never be 100%. And when the unlucky person working within established dynamic high-reliability norms falls victim to error, resulting disciplinary action may do more harm than good to system safety (Marx, 1997). Yet for both Marx and Reason, the measure of blame and punishment comes down to determining the intentions of the operator when an error or incident occurs.

Other early advocates of *just culture* expanded on the work of theorist in the study of organizational justice, who focused on concepts of fairness as it directly relate in the work environment (Greenberg, 1987, 1988; Bies, 1987; Bies and Shapiro, 1988). “Specifically, organizational justice is concerned with the ways in which employees determine if they have been treated fairly in their jobs and the ways in which those determinations influence other work-related variables” (Moorman, 1991, p. 845). These concepts of fairness in organizational justice, led to deeper understanding of accountability as both a catalyst for advancing just culture, and a deterrent in its retrospective form (Weick and Sutcliffe, 2003; Weick 2004; Ruchlin et al., 2004; Dekker, 2007). In this way, concepts of *just culture* began to diverge based on interpretations of accountability and culpability.

### 3. Accountability and culpability

Dubnick (1998) notes that *accountability* is an Anglican concept, whose meaning varies throughout the world, with many countries having no equivalent translation. “The simple view of accountability implied in its Anglo-Norman roots. That is, accountability is the condition of being able to render a counting of something to someone” (p.10). Yet, as Dubnick points out, accountability is not only reward-looking in the justification, reporting, or accounting of past events. It may also be forward-looking in duty, commitment, and loyalty. “It can be imposed from outside through force or legal mandate; it can come from within, through feelings of guilt or a sense of loyalty (p. 10).

Culpability on the other hand, as advocated for by Marx (1997) *Culpability Line* and *Just Culture Algorithm* (2008), or Reason’s (1997) *Culpability Tree* is based on determining the intentions of the operator when incidents or errors occur. While useful, in part, this approach, based on accountability as only retrospective reinforces a blame culture. A brief review of the etymology shows “culpability” stems from Old French *coupable*, and Latin *culpabilis*, meaning “worthy of blame” (Harper, 2016). These culpability models “provide a framework for reconstructing the sequence of actions and events leading to disaster. However, the tracing back process requires post hoc explanations. These may be highly plausible but their validity and generalizability are not easily testable” (McDonald et al., 2002, p. 198). “It’s easier, and perhaps more satisfying psychologically, to pin blame on an individual rather than to do the hard work of facing and addressing systems problems” (Berlinger, 2005, p. 97). For the operator, this form of “accountability is something to be avoided, even feared, and that it takes place after something has gone wrong” (Seiling, 2005, p. 59).

More recent works have advanced awareness of accountability as both retrospective and prospective in its forms (Sharpe, 2003; Berlinger 2005; McCune et al., 2011; Dekker, 2007, 2014). Such views acknowledge accountability as a negotiation in a variety of hierarchical, legal, professional, and political accountability relationships. Dekker (2009b)

recognized that the lines of accountability are not lines at all, but rather judgment calls that in many cases represent a moving target depending on who is making the call and the natural bias they possess. These safety science leaders advocate that the importance lies not precisely where the line is located, but rather who makes that determination (Dekker, 2007). Unintentional, intentional, and reckless behavior are all based on what accountability relationship the employee was operating in, and where the boundaries existed at the time the error occurred. “The accountability relationships that govern our lives are not only complex—because we must answer to a variety of others under a variety of ground rules—but often fluid and dynamic” (Lerner and Tetlock, 1999, p. 256).

Reducing fear, and the need to deflect blame, when errors occur promotes what Rivard and Carroll (2003) described as the shift from “hold individuals accountable for acting in accord with the system such that they maximize reliability and avoid error” to “hold people accountable for continually contributing to collective/whole-system learning and adapting” (p. 25). Expanding awareness of the fluidity of the boundaries between accountability relationships serves to promote a *just culture* by reducing fear and deflection of blame, while at the same time, promoting resilience through error reporting and system wide learning.

Gradually the focus on safety culture has been incorporated into a broader systems focus that looks at the organization, and the whole system environment within which it operates. The system is then viewed as “a complex and interconnected network of events” (Qureshi, 2007, P. 2). Leveson (2004) described safety in

terms of systems theory as “an emergent property that arises when the system components interact within an environment” (p. 11). This emergent property is congruent with many forms of accident causation theory as well. Essentially, both accidents and safety are emergent properties of any dynamic complex sociotechnical environment (Dekker and Pruchnicki, 2014).

These ideas and concepts along with a systems perspective primarily devoted to building constraints that reduce the chance of error, new research has begun to focus on safety through the study of organizational resilience. “In a world of finite resources, of irreducible uncertainty, and of multiple conflicting goals, safety is created through proactive resilient processes rather than through reactive barriers and defenses” (Hollnagel et al., 2007, p. 3) (Pruchnicki and Dekker, 2016).

Resilience engineering represents a shift in safety theories from viewing humans as unreliable components within the system to adaptive problem solvers that are continuously anticipating, reacting, learning and correcting for risk. This is the operational arena where safety emerges and through this new lens of resilience, *just culture* plays a vital role in creating the non-punitive environment that provides the psychological safety necessary for reporting of safety threats. A *just culture* does this by guarding against unnecessary and unfair discipline as employees move between and across lines of accountability within an organization. *Just culture* also allows room for collective accountability in complex systems which frequently depend on collaborative work to be successful. Individually and collectively, organizations learn through both retrospective and prospective forms of accountability.

### 4. Forms of accountability

Moving forward, it is important to first distinguish that accountability can be both retrospective and prospective (Schedler, 1999; DeVille, 2002; Sharpe, 2003; Rivard and Carroll, 2003; Johnstone, 2007). These two forms of accountability shape the types of accountability relationship boundaries along with employee behavioral expectations. For example, “some forms of accountability can increase defensive behavior, create adversarial relationships among parties who need to cooperate, or lead people to prefer options that are easier to justify given knowledge of the standards others impose for giving suitable accounts” (Woods, 2004, p. 3).

“Retrospective accountability is about holding someone to account for something in the past” (Wallis, 2013, p. 165). As Liang (2001) points out, “such a perspective does not incorporate corrective action; it does not identify, assess, or address the active and latent failures within the system to prevent future errors” (p. 350). While retrospective accountability aids in categorizing errors, it leads to blame and fear which deter further voluntary reporting of errors or near misses. In drafting reports, operators must weigh the personal risk against the safety benefit, and therefore chose their comments carefully. This guarded effort does not offer “people the ability to construct second, deeper stories of the incident” (Dekker and Laursen, 2007, p. 56). Rich, descriptive reports are vital for organizations, and individuals, to learn about both their strength and weaknesses within safety systems. The information garnered from these reports also offers a glimpse into how lean, or risky, operations may actually be.

On the other hand, prospective accountability supports reporting, learning, and planning within safety systems as part of a *just culture*. “Accountability is prospective when principals seek to establish agents’ accountabilities for future action” (Rivard and Carroll, 2003, p. 11). This form of accountability encourages voluntary reporting of incidents or near misses in the interest of mitigating future safety threats. “It encourages actors and institutions to

fulfill responsibilities toward individuals in order that harm does not occur, or at least that the risk of harm is decreased” (DeVilje, 2002). These responsibilities are central to a prospective view which offers the accountee a chance to help craft solutions to prevent future occurrences. Prospective accountability and restorative justice go hand-in-hand toward building a *just culture*. “Restorative justice achieves accountability by listening to multiple accounts and looking ahead at what must be done to repair the trust and relationships that were harmed” (Dekker and Breakey, 2016). Each creates a space for the operator to provide a full accounting of events, while at the same time engaging in preventing threats in the future.

Both retrospective and prospective forms of accountability exist in the all types of accountability relationships. This paper focuses on the hierarchical (also referred to as bureaucratic), legal, professional, and political accountability relationships (Romzek and Dubnick 1987; Romzek and Ingraham, 2000). It is the accountee’s movement, between these types of accountability relationships, which influences *just culture* within organizations in high-consequence industries.

**5. Accountability relationships by type**

Considering both retrospective and prospective forms, accountability can be seen as a means by which “workers manage the diverse expectations generated within and outside the organization” (Romzek and Dubnick, 1987, p. 228). Bovens and Schillemans (2011), note that multiple accountability relationships can be a burdensome overload with conflicting expectations, but may also derive benefits from redundancy. Employees adapt their behavior to meet the expectations set out in the different types of accountability relationships, weighing each against the other while accomplishing their work typically under time pressures and with limited resources. The types of accountability boundaries depicted in the model by Romzek and Ingraham (2000) offers a useful tool for later analysis of accountability influences on the pilots of Swissair 111. Fig. 1 below depicts the four types of accountability relationships, with perforated lines indicating movement between the different relationships.

Fig. 1 - Types of Accountability Relationships (Romzek and Ingraham, 2000, p. 242). Given the complexity and subtlety of accountability relationships the lines frequently blur as employees negotiate between and across the boundaries (Mulgan, 1997). Each type of accountability relationship has its own structure, applications, degree of autonomy, and expected sources of control.

**5.1. Hierarchical**

Hierarchical accountability relationships are based on position/rank with each supervisory level holding power over the other. These relationships are supported by detailed organizational rules, policies, procedures, and directives that outline employees roles

		Sources of Expectations and/or Control	
		Internal	External
Degree of Autonomy	Low	Hierarchical	Legal
	High	Professional	Political

Fig. 1. Types of accountability relationships. Depicts the four types of accountability relationships, with perforated lines indicating movement between the different accountability relationships (Romzek and Ingraham, 2000, p. 242).

and responsibilities within the hierarchical accountability relationships. In fact, employee behavior accepted as “good” or “successful” work frequently promotion which in turn offers new challenges and more “rank” over others. In its retrospective form, “processes of calling to account thus take place along strict lines of the ‘chain of command’ and middle managers, in turn, are both actor and forum” (Bovens, 2007, p. 458). Hierarchical accountability relationships, in the prospective form, can be seen as goal setting. The command system of the military is a classic example of hierarchical accountability and reflects low work autonomy for those at the subordinate ranks (Romzek and Ingraham, 2000).

Hierarchical accountability relationships are common in high-consequence industries where employees are distanced from decision makers in both time and space. Hierarchical organizations strive “to eliminate anomaly, standardize processes, solve short-term problems, and achieve stopwatch efficiency within its current mode of operating” (Kotter, 2011, p. 1). These are all commendable goals, but safety is not a short-term dilemma, and adapting to change becomes problematic in hierarchical organizations where communication flow is limited. The natural human ability to adapt is a significant human strength, but is stifled in these settings. Perry (2002) contrasts how hierarchical accountability relationships positively and negatively influence actions when adverse events occur.

When unsafe conditions are detected on aircraft carriers, there is a shift from the standard hierarchy to the personnel most knowledgeable in the specific context of the problem. . . . In contrast, the ‘command and control’ culture of health care, while effective (and necessary) during routine operations, can be an obstacle to maintaining or reestablishing safety (p. 849).

Establishing a *just culture* requires trust, and an expectation of being treated fairly to support reporting of errors and near misses in order to learn. To support this goal, hierarchical accountability relationships in dynamic high-consequence industries should be flattened which allows for empowering employees to play an active role in safety threat identification and risk mitigation. This shift would represent prospective, forward looking, accountability.

**5.2. Legal**

Legal accountability functions primarily in the retrospective form and can be seen in compliance and enforcement procedures throughout dynamic high-consequence industries. Its focused on deterrence and punitive measures, or in other words, on the threat of legal action in cases of failure to meet legal obligations (Ebrahim, 2003). “Legal accountability relationships involve detailed external oversight of performance for compliance with established mandates” (Romzek and Ingraham, 2000, p. 242). Scheduled inspections, audits, certification and specified training requirements, are just a few of the safety functions mandated to promote safety and monitored for compliance within legal accountability relationships.

Legal accountability is usually based on these specific responsibilities that are formally or legally conferred. Therefore, legal accountability may be seen as less ambiguous when compared to other types of accountability relationships, which are not based on detailed legal standards, prescribed by criminal, civil, penalties or administrative statutes, or precedent (Bovens, 2007).

External regulations remain the focus of legal accountability with little regard for internal and less formalized organizational norms or expectations (Ebrahim, 2003). Although, recently legal accountability has assumed a more prospective role. That is, one that encourages institutions to fulfill responsibilities toward individuals in order that harm does not occur, or at least that the risk

of harm is decreased. Therefore, lawsuits, or the threat of suits, can play a role in encouraging organizations to be accountable for their actions by prompting policy change, albeit through retrospective learning (DeVillie, 2002).

In this manner, legal accountability relationships influence all other forms of accountability relationships. For the employees in dynamic high-consequence industries, as accountee, this can create conflict between strict adherence to regulations, out of fear of punitive actions, or using judgment based on professional experience and expertise when emergencies arise. This double bind challenges the most seasoned professional and when negotiated successfully they are lauded as being exceptional. However, when outcomes are less desirable, now they are viewed in a negative fashion with labels such as “human error” and are followed with calls for training or punishment.

### 5.3. Professional

Different from hierarchical and legal, professional accountability relationships are based more on expertise in both education and experience. Managers and supervisors may have authority over the professional but defer to their expertise in meeting organizational goals. This approach is taken since qualified professionals have obtained the skills and values of a particular profession and are required to exercise professional judgment, typically without supervision (Friedrich, 1940; Romzek and Dubnick, 1987; Mulgan, 2000). They routinely navigate throughout the system where goal conflicts and limited resources challenge everyday operations. “Professional accountability systems are reflected in work arrangements that afford high degrees of autonomy to individuals who base their decision making on internalized norms of appropriate practice. These norms can derive from professional socialization, personal conviction, organizational training, or work experience” (Romzek and Ingraham, 2000, p. 242).

In its retrospective form, professional accountability focuses on professionals being answerable for their role in meeting organizational goals, judgment, and maintaining agreed to standards of the practice (Fuhrman and Elmore, 2004). In contrast, professional accountability in its prospective form can be seen as goal setting, defining how professional obligations can be best filled, or even a continual search for best practices as various challenges are mentally mapped out in a type of professional pre-plan (Sharpe, 2003).

Professional accountability relationships may be based on external requirements, such as regulations, professional norms, and codes of conduct. They can also be based on internal values and self-expectations. In dynamic high-consequence industries, professionalism can also lead to what Hollnagel, Woods, and Leveson described as “well-intentioned people in dysfunctional organizations” (2007, p. 165). In these dysfunctional organizations, human adaptability is sometimes (depending on outcome) viewed as a liability and source of error – these stories are of course constructed in hindsight with all the biases commonly experienced. Through their professional standards, both external and internal, employees may do whatever is necessary to meet organizational goals, leaving safety threats undetected within the organization. They can also build unrealistic expectations, based on managers’ understanding of perceived work compared to how actual work is accomplished. This gap is common in dynamic complex sociotechnical systems. Written guidance, in the form of regulations, policy, operator manuals, or even checklists, are constructed in ways that always fall short of the true dynamic nature of these events, and therefore unable to cover all the situations for which they are crafted. These dynamic complex environments are where humans excel as we are remarkably capable adaptive agents.

### 5.4. Political

From within political accountability relationships, actors are sensitive to the responsiveness of both internal and external stakeholders. “Emphasis on customer service orientations and responsiveness to client needs reflect this type of accountability relationship” (Romzek and Ingraham, 2000, p. 242). In its retrospective form, political responsiveness focuses on filling the needs of the organizations and its stakeholders. Political accountability in the prospective form focuses on determining and meeting demands.

In political accountability relationships accountees learn to anticipate needs and adapt to changing expectations. “Responsiveness turns accountability outward rather than upward”. Where hierarchical accountability relationships focus on satisfying the goals of those at the top of the organization, political accountability relationships are concerned with meeting the needs and demands of those they serve. Stakeholders can include, but are not limited to shareholders, customers, employees, governments and regulators, community groups, labor unions, and industry partners.

While these political accountability relationships are important in helping promote safer operations, they can however still become corrupt. For example, following the 2008 investigation of the Federal Aviation Administration collusion with airlines resulting in safety lapses, James Oberstar, former chairman of the House Transportation and Infrastructure Committee for the U.S. Senate, was reported to have said; “there was a ‘culture of coziness’ between senior FAA officials and the airlines and ‘a systematic breakdown’ in the FAA’s culture that resulted in ‘malfeasance, bordering on corruption’” (Neuman, 2008).

## 6. Discussion

Each day, employees in their day-to-day work activities, must negotiate the boundaries of four accountability relationship types, hierarchical, legal, political, and professional. The behavioral expectations for employees in dynamic high-consequence industries are then based on the type of accountability relationship and the form within which it exists. Despite the demand for clear lines of accountability upon which to base a *just culture*, there is no single clear line of accountability that establishes where blame and blamelessness lie when adverse events occur. This may be the best single consideration that can have the most impact for how well programs such as self-reporting operate within the organization and to the degree with which they offer leverage for change.

Reason (2000b) introduced the idea of clearly defined lines of accountability as necessary for the establishment of a *just culture* when he said a reporting culture must be “underpinned by a just culture in which the line between acceptable and unacceptable behavior is clearly drawn and understood” (p. 293). We would argue otherwise as the actors’ views are based on the ability to determine what another person was thinking at the time an event (local rationality) occurred, and whether they acted intentionally (a violation) or unintentionally (an error) (Dekker, 2014). Reason argued that “nearly all errors are unintended, while most violations involve a conscious decision to depart from standard operating procedures (Reason, 1998, p. 303). However, what is not made clear is that successful adaptive behavior is required to resolve conflicting goals in accountability relationship. These deviations are typically required and demonstrate one facet of resilience and human adaptive capacity.

Marx (1997) expanded on this theme by suggesting that the focus of a mishap disciplinary exercise should be on intentional risk taking since it is not the human error we should condemn, but the occasional underlying reckless behavior that needlessly

puts aviation safety at risk. Marx asks two simple questions in determining blame and punishment: “did an individual violate a rule, and did the individual intentionally violate a rule” (2001). This myopic view completely fails to understand work in complex socio-technical systems and fails completely to increase workplace safety. Again, returning us to the reliance on assigning intention when errors occur, which is best reserved for tort litigation, and does little to advance safety.

Those at the pointy-end of safety sensitive work may beg to differ with Reason and Marx retrospective application of accountability as blame. For a pilot, or Air Traffic Controller, a simple altitude deviation, or passenger getting up to use the lavatory while the aircraft is taxiing could be an unintentional error, yet still result in a violation or criminal charges, which are on the rise. For example, [Mateou and Michaelides-Mateou \(2012\)](#) found that over a 43-year period (1956–1999), there were 27 cases of aviation accidents that were criminally investigated and as many as 28 cases during the ten-year span of 2000–2009. This represents an almost fivefold increase during this smaller time frame.

Unfortunately, this is not only seen in aviation but also situations where health-care providers make a medication error. In a case like this, not only could the incident have been an “unintended” error but still could result in a violation, legal sanction, loss of license, and loss of employment. Who makes the decision of whether the act was unintended or a conscious decision depends on a variety of factors such as, who reported the incident, had this type of incident occurred before, will the event tarnish the reputation of the organization or profession, and is the organization financially liable, to name just a few. It is this retrospective view of accountability, and misrepresentation of clear lines of accountability, that curbs full support for both implementing and sustaining a just culture.

For those working in dynamic high-consequence industries, these accountability relationships create conflicts as managers and employees negotiate moving from one to the other when safety abnormalities occur. One of the most salient examples, of conflict created through the misinterpretation of accountability relationship boundaries as rigid lines, is offered by [Carley \(1999\)](#) and [Dekker \(2001\)](#) in describing the decision-making conflict onboard a Swissair, McDonnell Douglas, MD-11 aircraft that crashed south of Halifax International Airport, Nova Scotia in 1998.

## 7. Swissair Flight 111 brief background

On the evening of September 2, 1998, Swissair Flight 111 departed from John F. Kennedy International Airport, New York, U.S.A., en route to Geneva, Switzerland. About an hour after departure, cruising at 33,000 feet, the flight crew smelled smoke. Assisted by Air Traffic Control the pilots declared an emergency and diverted to Halifax International Airport, Nova Scotia. While the crew worked to complete the checklists, the aircraft, crippled by fire, crashed into the ocean only a few miles southwest of Peggy's Cove, Nova Scotia, CA, killing all 229 onboard ([Transportation Safety Board of Canada, 2003](#)).

Investigation reports and news source revealed multiple findings including, faulty wiring, flammable covering on insulation blankets, lax oversight by regulators, and procedural checklists issues that contributed to the fire onboard Swissair 111 ([Transportation Safety Board of Canada, 2003](#); [Cohen, 2003](#); [Stoller, 2003](#)). It is important to note that “the training received by the crew of SR 111 was consistent with industry norms; however, it did not prepare them to recognize or combat the in-flight fire” (p. 215). Again, strict compliance with all procedures is not always appropriate and may in fact make the situation much more dangerous. Prior to the [Transportation Safety Board \(2003\)](#) report,

pilot training focused on eliminating the threat from smoke in the aircraft by using the emergency checklists provided which could take up to 30 min or more to complete.

The strict compliance culture of Swissair, regulators, and actions of the pilots, led to debates on appropriate emergency responses in the event of inflight smoke or fire. [Carley \(1998\)](#) uses interviews surrounding the debate to capture the differing views shared by senior pilots. He quotes, safety analyst and Boeing 727 commercial pilot, John Nance's comments on the culture of Swissair at the time. “The captain did exactly what the pilot culture and Swissair's culture dictated: follow the usual procedures – which was absolutely wrong. . . . When there's smoke, forget the trouble-shooting. Get the airplane on the ground” ([Carley, 1998](#)). [Bennett \(2007\)](#) in his study of Crew Resource Management (CRM) questioned the “degree Swissair's emphasis on rigid emergency checklist procedures dulled its pilots' willingness and ability to action their CRM training.” In fact, at the time, the Swissair checklist, along with other McDonnell Douglas checklists, referenced “landing as the last action item on the checklist” ([Transportation Safety Board, 2003, p. 217 & 303](#)).

[Carley \(1998\)](#) points out that, “any pilot who does deviate from procedures risks suspension from his job by his airline or even revocation of his flying license by government authorities.” Swissair's chief safety pilot, Captain Jueng Schmid, is quoted confirming the crew of Swissair 111 “followed our procedures” ([Hubacher and van Beveren, 1999](#)). For the crew of Swissair 111, following those procedures, in completing the Smoke/Fumes of Unknown Origin Checklist in the MD-11, could take up to 30 min or more, allowing time for a fire in the insulation blanket to progress ([Transportation Safety Board, 2003](#)). In addition, up until the Swissair 111 flight “no specific training was provided for locating and suppressing fires in the cockpit or avionics compartment. Such training was not required by regulations, nor was it common industry practice to provide it” ([Transportation Safety Board, 2003, p. 162](#)). They were expected to detect smoke or fire, on the flightdeck, through sight or smell. While the regulations, procedures, and training may not adequately cover all emergencies, operators must nonetheless consider the risk, to both safety and protecting themselves from sanction, when deviating.

As of 2013, eight of the fourteen safety recommendations proposed by the [Transportation Safety Board of Canada \(2003\)](#) had been acted on through new safety regulations.

## 8. Conflict created by accountability relationships

In the tragic case of Swissair 111, [Carley \(1999\)](#) and [Dekker \(2001\)](#) reveal how the two Swissair 111 pilots differed in their view of how to cope with the emergency. As noted above, their opinions were shared by other pilots in the debate on following the prescribed checklist or deviating, with the risk of sanction of loss of license. We take the next step by looking at how accountability relationships influenced the Swissair 111 pilots' behavior.

After declaring the emergency ATC notified the crew they were about 30 min away from Halifax and assigned a descent. The first officer, anxious to get to the airport before the smoke worsened began a rapid descent at about 4000 feet per minute. The Captain, more focused on completing the required checklist, told the first officer “not to descend too fast” ([Carley, 1999](#)). The first officer also recommended to the Captain, forgoing dumping the fuel which would further delay getting the aircraft to the Halifax International Airport. “The Captain insisted on staying with the checklist. The copilot repeatedly suggested steps that would have rapidly accomplished heading to the nearest airport for an emergency landing” ([Dye, 2013, p. 139](#)). The Captain declined the first officer's recommendation and stuck to the legal and hierarchical requirements to

follow the checklist in all emergencies. The first officer radioed ATC “We have to land immediate” (ATC Transcript Swissair 111, 2004). The captain persisted and at one point “per the summary [of the Cockpit Voice Recording], he replied that he was in the midst of a checklist and ‘didn’t want to be interrupted’ so often” (Carley, 1999).

At the time of the occurrence, the first officer was an instructor on the MD-11, as both simulator and transition instructor (Transportation Safety Board of Canada, 2003). The first officer forgoing legal and hierarchical accountability relationships turned to expertise in professional accountability relationships, preferring to bypass some checklist requirements to expedite getting the aircraft on the ground. “Analysis of the cockpit voice recorder of Swissair 111 reveals a disagreement between the captain and first officer on the appropriate procedures to be followed when smoke began filling the cockpit” (Wolk, 1999).

The Captain, who was also Swissair’s chief instructor, and the primarily accountable crew member in both the hierarchical and legal accountability relationships, clearly chose to strictly follow the prescribed checklists to protect this relationship/responsibility. Based on the CVR transcripts, and actions taken by the crew, it is likely the captain and first officer were not fully aware of the extent of the hidden fire. “They would not have expected there to be a significant fire threat from that area, or from any other hidden area” (Transportation Safety Board, 2003, p. 231). It is important to remember that our understanding of their actions, and those of the investigators, are created in hindsight which offers a biased point of view. Additionally, there was clearly a demonstrated difference between the pilots as to possible level of risk which drove each of them to different accountability constructs. The CVR captured, on several occasions, the first officer’s attempt to shift the captain to his view to speed up the landing attempt. Obviously, if either crew member had known the true extent of the fire and the very likely outcome of an accident, their actions would have supported that understanding.

In this case the Captain’s decision, based on the legal and hierarchical accountability relationships, reflects how “legal accountability patterns are mainly used when accidents happen or charges of inappropriate behavior are made” (Romzek and Ingraham, 2000, p. 4). Failing to follow the required checklist could have resulted in reprimand, or termination of employment, based on hierarchical accountability.

In the case of Flight 111, crew intuition and initiative were, for a major portion of the developing emergency, subordinated to compliance. The flight crew’s implementation of an elaborate Swissair check-list procedure wasted so much time that when they finally understood what they had to do -- land or ditch immediately -- the window of opportunity had gone.

[(Bennett, 2007)]

Had they deviated successfully, based on the legal accountability relationship, failing to follow the checklist could have resulted in sanctions, including loss of his professional pilot license, and now the possibility of criminal charges.

The ineffective Marx school of thought reinforces this course of action and accountability paradigm. This strict adherence to accountability as only retrospective is dangerous because accountable operators, with high levels of responsibility, fear this professional ridicule, sanctions, loss of employment, and potential loss of license after an event. This very easily may force them to remain fixed, between the retrospective view of legal and hierarchical accountability boundaries, and fail to act, which is only made worse when the depth and extent of the danger isn’t fully known as shown in the Swissair accident. It may also inhibit voluntary reporting which could serve to mitigate such threats.

This case provides an excellent example of how employees are caught in a “double-bind,” trying to negotiate between two accountability relationships where no clear line exists, even in life threatening conditions. Acting on expectations based on the legal and hierarchical accountability relationship “people can get blamed for their inflexibility; their application of rules without sensitivity to context” (Dekker, 2001, p. 383). On the other hand, acting on expectations based on professional accountability relationships, by adapting to unexpected conditions without certainty of the outcome, “people get blamed for their deviations; their non-adherence” (Dekker, 2001). This is especially true when the outcome is negative to the operation as opposed to a success which is frequently celebrated. Same decision, but different outcomes, are the primary driver for the construct of culpability.

The case of the Swissair 111 pilots, as they negotiated the accountability relationship boundaries, demonstrates how lines of accountability are not clearly defined. Decision, even those effecting safety, are made based on the accountability relationship deemed most important to the individual. This is seen in the Swissair 111 accident as the two pilot saw differing responses to the in-flight emergency based on the weight each pilot attributed to the accountability relationship they were operating in. The captain’s was between the boundaries of legal and hierarchical, while the first officer operated in professional, while attempting to negotiate hierarchical accountability relationship boundaries.

## 9. Conclusion

There are no clear lines of accountability that determine who is blameworthy and who is not, only fluid boundaries created by the different accountability relationships working in an environment which can emergently produce either safety or the next accident. Within these accountability relationship boundaries managers and employees moves, while negotiating how to best meet their individual needs, and those of the organization. Recognizing the fallacy of rigid lines of accountability, where appropriate behavior resides on one side, and inappropriate on the other, has the potential to improve these relationships while at the same time enhancing safety reporting. Creating a just culture that supports resilient organizations in high-consequence industries requires a deeper understanding of how actual work is conducted within the boundaries of accountability relationships. By reducing, or removing the fear of crossing the moving line of accountability, employees are free to expand their reporting of events, as the individual experienced them, rather than through the guarded narrative necessary for self-preservation.

Promoting a *just culture* is based on treating people compassionately, and fairly, when errors do occur. This requires creating a culture where management is willing to go beyond the first story, to understand the deeper and more complicated second story through the narrative of the operator. Accepting the fluidity of lines within accountability relationships supports *just culture* by revealing how resources and double-binds always exist, and the outcome, unlike our privileged post event investigative view, is always uncertain. This is not to suggest no accountability, but rather an acceptance of accountability as both retrospective and prospective construct. Thereby, allowing employees to offer an accounting of events as they occurred and, at the same time, a role in preventing future threats. This broader understanding of accountability relationships encourages the reporting of near misses, as well as successes, in establishing and maintaining safety resilient organizations. In turn, learning from mistakes becomes valued as path to sharing knowledge and a way to close the gap in accountability relationships between manager’s perception of

work and how actual work is accomplished in high consequence industries.

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