

WHETHER REPORT?

UNDERSTANDING JUST CULTURE THROUGH SAFETY REPORTING

Improving our understanding from safety reporting is part of the *raison d'être* of Just Culture, and voluntary reporting has a critical role. Comparing the attitudes and behaviours of pilots, dispatchers, air traffic controllers, and maintenance personnel, **James Norman** finds important differences between the groups, shedding light on the challenges and opportunities ahead.

KEY POINTS

- **Voluntary reporting is critical to understand safety hazards and the health of a safety management system.**
- **This study found that principles of Just Culture in the US have not permeated significantly beyond pilots and dispatchers. Maintenance and ATC personnel reported a lack of resources and opportunities for remediation, with reporting programmes often being punitive or perceived as such.**
- **All employee groups expressed frustration over a lack of feedback after reporting, discouraging further reporting. A positive Just Culture mitigates this frustration.**
- **Workarounds, such as conducting independent reviews or accessing additional data, are adopted by employees due to a lack of trust in event review committees and the reporting process.**
- **Maintenance was identified as having a blame culture, attributed to factors such as the "many hands, one signature" credo, economic pressures, time constraints, and outsourcing.**

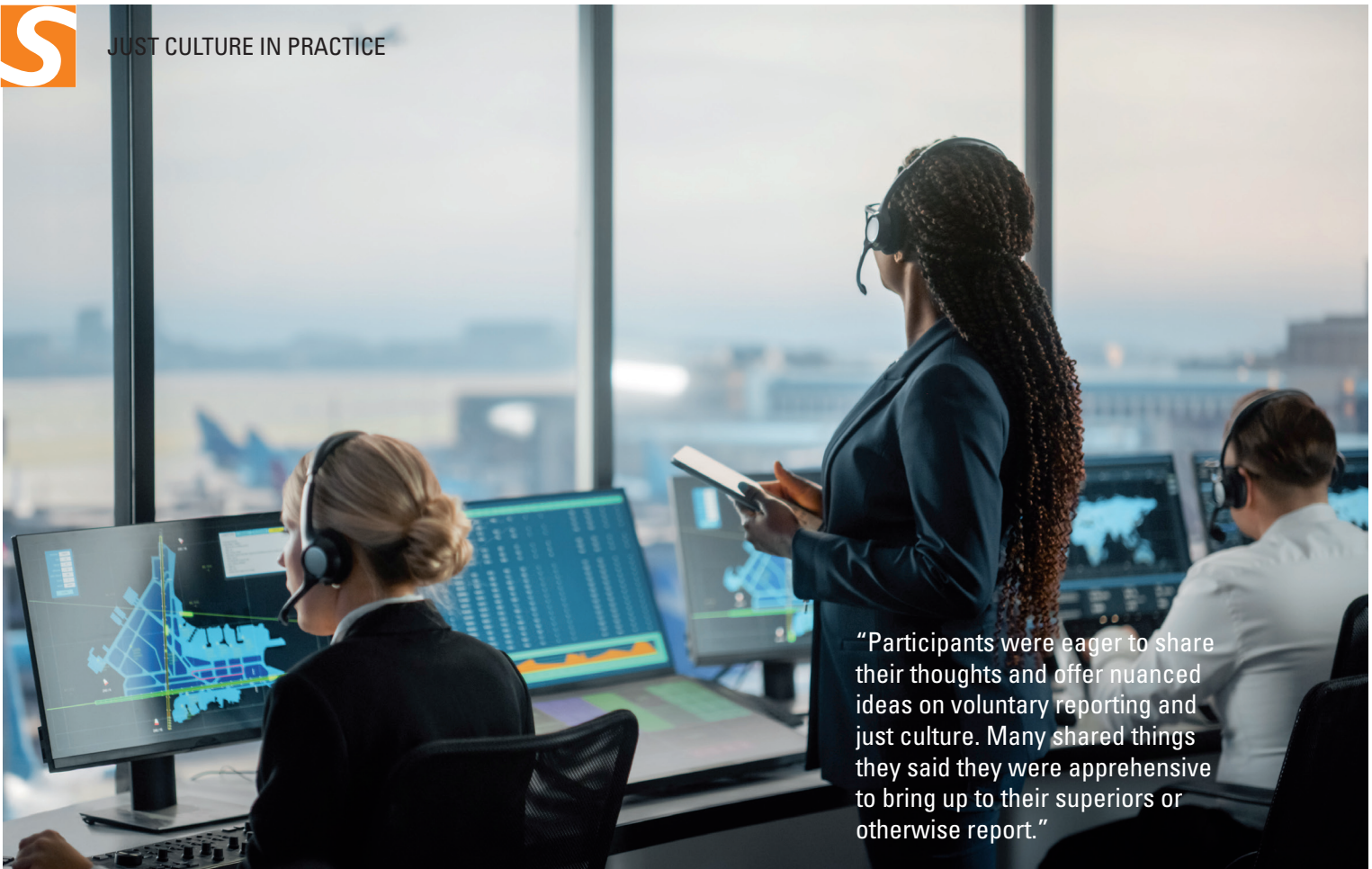
in safety margins. Or perhaps you identified a hazard that did not affect you but could affect others. Your organisation has a mandatory reporting program, and its requirements are well understood. But when it comes to voluntary reporting, what encourages you to report, or discourages you from doing so?



The *bocche di leone* (lion's mouths) may be the earliest form of voluntary reporting. The repositories were placed around Renaissance-era Venice as a way for citizens to lodge complaints towards local government. As per safety reporting today, they were confidential, not anonymous. This promoted accountability and corrective actions... hopefully not involving the Bridge of Sighs.

We've all experienced it. Something disconcerting happened during your day. Perhaps a bad procedure led to a breakdown

I recently finished two years of research towards a dissertation that focused on this topic. Plenty of literature has examined pilots and reporting (the ultimate sharp end). However, research did not look upstream at other employee groups such as dispatchers, air traffic controllers, and maintenance. These groups exercise robust operational control in commercial aviation, but their voices and attitudes are barely studied. In the case of dispatchers, no studies existed prior to mine, which is remarkable given the fact that the Federal



“Participants were eager to share their thoughts and offer nuanced ideas on voluntary reporting and just culture. Many shared things they said they were apprehensive to bring up to their superiors or otherwise report.”

Aviation Administration (FAA) grants dispatchers 50% of operational control of a flight. Regarding maintenance, we understand that a blame culture exists, but its aetiology is unknown.

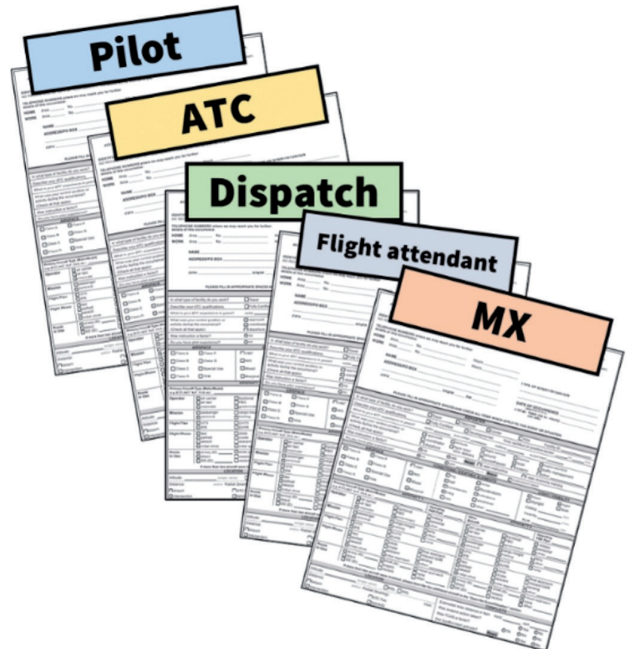
My study set out to compare four groups (pilots, dispatchers, ATC, maintenance) and explore their attitudes and behaviours towards voluntary reporting, using just culture as a framework.

The Relevance of Reporting

Why voluntary reporting? Why not just rely on mandatory reporting for obtaining safety information? I would argue these points:

- Voluntary reporting rates are a vital metric for the health of your safety management system (SMS) (ICAO, 2018; Stolzer et al., 2023).
- A strong reporting culture likely indicates a strong overall just culture (Kirwan et al., 2018).
- In the ultra-safe industry of commercial aviation, hazard identification and mitigation offers a more robust systemic approach than incident and accident investigation. The best way to identify hazards is through voluntary reporting.
- Single pilot and no-pilot operations, if realised, will abate opportunities for hazard identification by pilots. It is thus even more critical to elevate the importance of frontline reporting, showing the continued need for humans-in-the-loop.
- A robust SMS requires a 360° view of the operation. We currently have safety blind spots due to substantial underreporting beyond pilots. When an event happens, we should receive reports from all relevant parties.

- The inclusivity zeitgeist of today calls for all employee groups to have an equal voice; this may not be the case in aviation safety reporting today.



To illustrate the last point, let’s look at last year’s submissions to the Aviation Safety and Reporting System (ASRS) (Figure 1). This is the US-based programme that takes in voluntary reports from various employee groups. (Because the FAA treats individual airlines’ reporting metrics as protected data, ASRS is the only metric available to gauge the state of voluntary reporting.)

Figure 1: 2022 ASRS Monthly Reporting Average.

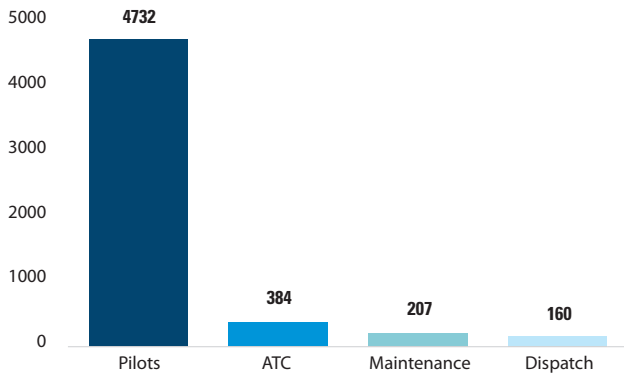


Figure 1 shows that pilots comprise the majority of voluntary safety reporting. These numbers are a count, not a rate. Taking this into account and norming for employee group size, we find underreporting rates to be roughly:

- ATC: ~50% underreporting
- Maintenance: ~96% underreporting
- Dispatch: ~32% underreporting

To try to understand the attitudes and behaviours of the four groups I identified, I designed a mixed methods study. I started with a survey that was open to all US-based employees in commercial aviation. I used statements like *“Our safety reporting system is convenient and easy to use”* and *“I report near-miss events or hazards that could lead to an incident, even when no harm was done.”* In total, 32 questions captured five constructs relating to organisational safety values, reporting friction, previous experience, reporting culture, and overall just culture. I received about 400 responses.

The survey was followed up by a series of one-on-one, confidential interviews. Each lasted about an hour. I transcribed the text and used a combination of manual coding and the artificial intelligence of natural language processing (NLP) to validate survey findings, and discover new themes as they emerged from the interviewees. Participants were eager to share their thoughts and offer nuanced ideas on voluntary reporting and just culture. Many shared things they said they were apprehensive to bring up to their superiors or otherwise report.

“Principles of just culture have largely not permeated beyond pilots and dispatchers.”

The Findings

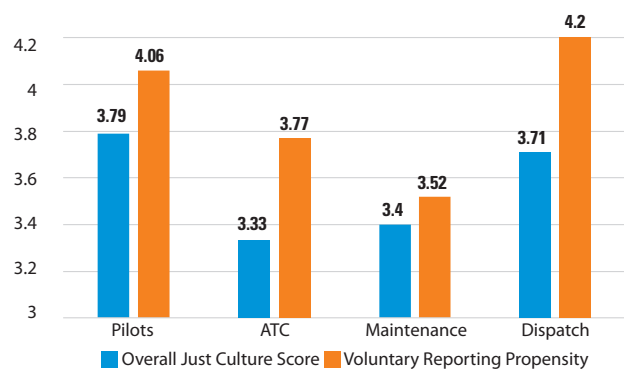
While I can’t detail all the research findings here, I will bring forth some of the highlights.

First, principles of just culture have largely not permeated beyond pilots and dispatchers. When a safety report is generated by a pilot, for example, a wide range of corrective actions is available, ranging from human factors debriefs to simulator time. Often corrective actions are directed towards the organisation or regulator. However, maintenance and air traffic controllers were near unanimous that their reporting programmes offer scant resources or opportunities for

remediation. When it does happen, it’s often punitive in nature – or perceived to be.

This finding is especially relevant, as the US ASAP Advisory Circular was updated three years ago to implement just culture principles, including auto-inclusion of reports and deletion of time limits to report (FAA, 2020). It appears that the FAA has some work to do if its vision for just culture for all is to come to fruition. Figure 2 shows just culture perceptions among groups and their propensity to report. Interestingly, ATC shows an increased level of reporting compared to their low scores for just culture.

Figure 2: Just Culture and Reporting Propensity Results.



Second, all employee groups in the study were strongly discouraged by a lack of feedback after they report. The ‘black hole effect’ creates a sense of dread when reporting. After reporting, interviewees said they had memorised the bot-generated email response they would receive. But Just Culture has a positive mediating effect on this. In other words, if the organisation has a positive Just Culture, the frustration felt by a lack of feedback is largely ameliorated.

Third, employees use workarounds during the reporting process. A fascinating example was an air traffic controller who told me that before submitting a report, he ‘pulls the tapes’ and reviews the event on his own, because he does not trust the event review committee (ERC) to forward its findings to him afterwards. This practice is also spreading to pilots and dispatchers, who have immediate access to ADS-B data after an event and can ascertain separation or groundspeed. Workarounds are an unfortunate outcome to lack of feedback as well.

Fourth, age is associated with the perception of just culture. Both younger and older employees have less favourable perceptions of just culture than do mid-career aviation employees. This supports previous similar findings. It is possible that younger employees do not understand just culture principles, and perhaps older employees are more jaded.

A final finding to highlight is the continuance of a blame culture in maintenance. This has been well established in the

literature (e.g., Twyman, 2015; Walala, 2016). One maintenance technician told me, “*We are the curmudgeons – the grumpy and grizzled old guys.*” My research found that there could be a few contributory factors to this. Maintenance is unique with regard to the “many hands, one signature” credo. Upwards of 30 technicians can work on an aircraft during heavy maintenance, yet one person ultimately attests their name to the airworthiness release. Maintenance workers also experience increased economic pressures and time constraints. It is estimated over 50% of maintenance is outsourced in the US (Quinlan et al., 2013). This may lead to the thought that if the work is not done correctly, it will be taken away. The same cannot be easily said for pilots, controllers, or dispatchers.

Closing Thoughts

During the two years of research, I heard the arguments “*Why should we voluntarily report when our mandatory systems aren’t even working correctly?*” Or “*My airline/ANSP gets thousands of reports and can’t deal with the volume, so what difference does it make?*” I would offer the following perspective.

The rapid advances in AI and large language modelling (LLM) (e.g., ChatGPT) are likely to assist textual safety reporting analysis in your organisation. I believe that the problems we face in making sense of safety reporting as a labour-intensive act will be lessened as AI supplements the processes. Some airlines in the US have hired data scientists in an earnest effort to infuse their SMS with data science principles. Yet, we will probably always need human sensemaking in safety reporting programmes.

I view too much information as a good problem to have. A sculptor starts with a slab of marble and whittles it away to reveal something meaningful, if not profound, for the audience. The same is true for safety reporting. Our challenge in safety management is to remove the noise to reveal the signal. Like Michelangelo, this is an art, not a science.

To summarise, I found differences in the attitudes and behaviours of pilots, dispatchers, air traffic controllers, and maintenance personnel towards reporting and Just Culture in the US. While pilots and dispatchers benefit from a more supportive reporting environment, maintenance and ATC personnel often face punitive or limited resources for remediation. The findings emphasise the need for a comprehensive and inclusive reporting culture that extends beyond pilots and dispatchers. Additionally, the study highlights the significance of providing timely feedback to reporters and addressing the ‘black hole effect’ and encourage continued reporting. The research underscores the need to embrace Just Culture principles, improve communication, and foster a sense of trust and accountability across all employee groups. While the findings may not be generalisable to your organisation due to cultural or regulatory differences, safety reporting is a crucial data stream for any organisation. Voluntary reporting is essential for the safety of passengers and staff, providing a more comprehensive view of hazards compared to mandatory reporting alone. **S**

References

- FAA. (2020). *Aviation safety action program (ASAP)*. US Department of Transportation. [https://www.faa.gov/documentLibrary/media/Advisory_Circular/AC_120-66C_\(Edit\).pdf](https://www.faa.gov/documentLibrary/media/Advisory_Circular/AC_120-66C_(Edit).pdf)
- ICAO. (2018). *Safety management manual*. International Civil Aviation Organization. <https://www.icao.int/safety/safetymangement/pages/guidancematerial.aspx>
- Kirwan, B., Reader, T., & Parand, A. (2018). The safety culture stack – the next evolution of safety culture? *Safety and Reliability*, 38(3), 200–217. <https://doi.org/10.1080/09617353.2018.1556505>
- Quinlan, M., Hampson, I., & Gregson, S. (2013). Outsourcing and offshoring aircraft maintenance in the US: Implications for safety. *Safety Science*, 57, 283–292. <https://doi.org/10.1016/j.ssci.2013.02.011>
- Stolzer, A. J., Sumwalt, R. L., & Goglia, J. J. (2023). *Safety management systems in aviation* (3rd edition). CRC Press.
- Twyman, K. (2015). *Reporting error in aircraft maintenance: Are engineers reporting safety concerns?* Massey University.
- Walala, M. (2016). *A cross-sectional and mixed-method assessment of safety culture and safety climate at a regional airline*. Purdue University. https://docs.lib.purdue.edu/open_access_dissertations/723



James Norman is an A-330 pilot and holds a PhD in Aerospace Science from the University of North Dakota, where he is a faculty member. In addition to pilot duties, he works on behalf of the Air Line Pilots Association (ALPA), teaching risk management, safety management systems, and safety leadership. He recently served as guest editor for the 14th edition of the Resilience Engineering Association’s newsletter (<https://www.resilience-engineering-association.org>).