

Influence of Organisational Culture on Safety Compliance Behaviour Among Aviation Maintenance Technicians.

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ABSTRACT

Despite rigorous regulatory frameworks like EASA Part-145 and FAA AC 120-79A, aviation maintenance organizations (AMOs) exhibit significant variance in safety compliance outcomes. This study investigates the influence of organisational culture on safety compliance behaviour among aviation maintenance technicians in Nigeria, addressing the gap between structural Safety Management Systems (SMS) and actual technician behaviour. Grounded in Edgar Schein's tripartite model of organizational culture, the research employs a concurrent mixed-methods design, surveying 178 licensed and unlicensed technicians across various maintenance domains and conducting 20 semi-structured interviews. Quantitative results indicate that cultural dimensions explain 34% of the variance in routine compliance and 41% in discretionary safety behaviour. Management Commitment emerged as the strongest predictor of routine compliance ($\beta = .29$), while Just Culture was the dominant predictor of discretionary safety behaviour ($\beta = .34$). Notably, the effect of management commitment on discretionary behaviour was fully mediated by just culture perceptions. Production pressure negatively impacted both compliance types, disproportionately suppressing voluntary safety contributions. Qualitative findings revealed a dissonance between espoused safety values and underlying assumptions, with technicians describing SMS documentation as "audit theatre" and adhering to informal "real procedures" transmitted through peer enculturation. Core assumptions such as "experience trumps documentation" and "real professionals solve problems silently" were identified as primary drivers of non-compliance. The study concludes that sustainable safety compliance requires targeting basic underlying assumptions rather than merely enhancing artifacts or espoused values. Recommendations include establishing facilitated dialogue sessions to surface assumptions, implementing formal decision documentation protocols for safety-production trade-offs, and restructuring apprenticeship programs to integrate tacit knowledge formally. These findings offer AMO leaders and regulators evidence-based strategies for evolving from document-based auditing to performance-based cultural assessment.

Keywords: Organisational Culture, Safety Compliance, Aviation Maintenance, Schein's Model, Just Culture, Management Commitment, Production Pressure.

INTRODUCTION

The global aviation industry has achieved remarkable safety milestones over the past two decades, yet maintenance-related incidents continue to represent a significant proportion of operational disruptions and accidents. While aircraft design and pilot training have seen systematic improvements, the human element within Aircraft Maintenance Organizations (AMOs) remains a complex variable in the safety equation. Recent data

from the European Union Aviation Safety Agency (EASA, 2024) indicates that maintenance and inspection deficiencies still account for approximately 15% of all commercial air transport accidents and serious incidents, underscoring that technical compliance alone is insufficient without a supportive organizational foundation. Within this context, the influence of organisational culture on the safety compliance behaviour of aviation maintenance technicians has emerged as a critical area of inquiry, shifting the analytical focus from individual error to systemic cultural determinants.

Safety compliance behaviour in aviation maintenance is distinct from other high-reliability industries due to the unique combination of time pressure, regulatory scrutiny, physical fatigue, and the often-invisible nature of latent defects. Compliance is not merely the binary adherence to written procedures; it encompasses discretionary safety citizenship, reporting behaviours, and the willingness to halt unsafe work despite production pressures. Research by Guldenmund et al. (2023) emphasizes that safety culture operates at multiple levels artifacts, espoused values, and basic underlying assumptions and that misalignment between these levels creates the conditions where non-compliance becomes normalized. In maintenance environments, this misalignment frequently manifests as a gap between management's stated commitment to safety and the lived experience of technicians on the hangar floor, where resource constraints and scheduling demands implicitly signal competing priorities.

The theoretical understanding of safety culture has evolved significantly since James Reason's foundational work on just culture and organizational pathogens. Contemporary scholarship now recognizes that safety culture is not monolithic but comprises interrelated subcultures, including reporting culture, learning culture, flexible culture, and just culture. A recent systematic review by Li and Wang (2024) found that among these dimensions, perceived management commitment and peer support are the strongest predictors of routine safety compliance among maintenance personnel, whereas just culture perceptions more strongly predict voluntary reporting and discretionary safety behaviours. This distinction is vital because traditional compliance monitoring systems often capture only routine adherence while missing the discretionary behaviours that serve as early warnings of systemic degradation. The implication is that AMOs must cultivate multidimensional cultural profiles rather than pursuing a singular "safety culture" metric.

Despite extensive research on safety culture in flight operations, the maintenance domain presents unique contextual factors that limit the direct transferability of existing models. Maintenance technicians operate under different incentive structures, supervisory ratios, and feedback cycles compared to flight crews. The work is often solitary or conducted in small teams during night shifts, reducing real-time supervision and increasing reliance on internalized norms and peer-based accountability. Furthermore, the increasing complexity of modern aircraft systems and the integration of digital maintenance records have introduced new cognitive demands that interact with cultural factors in ways not yet fully understood. A study by Al-Saidi and O'Connor (2023) highlighted that digital transformation in MRO (Maintenance, Repair, and Overhaul) organizations can either enhance safety transparency or create new forms of procedural alienation, depending entirely on the pre-existing cultural readiness of the workforce. This suggests that technological and cultural interventions must be co-designed rather than sequentially implemented.

The problem this study addresses is the persistent variance in safety compliance behaviour across AMOs that possess ostensibly similar regulatory certifications and safety management systems (SMS). Regulatory frameworks such as EASA Part-145 and FAA AC 120-79A mandate SMS implementation, yet compliance outcomes vary dramatically between organizations operating under identical regulations. This variance points to organisational culture as the mediating variable between regulatory requirements and actual technician behaviour. While SMS provides the structural scaffolding for safety, culture determines whether that scaffolding is inhabited authentically or treated as bureaucratic performance. Recent incident investigations, including those analysed by the International Civil Aviation Organization (ICAO, 2023), repeatedly identify cultural deficiencies such as fear of reprisal, normalization of shortcuts, and inadequate cross-shift communication as root causes that existed long before the triggering event, despite compliant SMS documentation.

This study therefore seeks to empirically examine the specific mechanisms through which organisational culture influences safety compliance behaviour among aviation maintenance technicians. Rather than treating culture as

a generic independent variable, this research disaggregates culture into measurable dimensions and examines their differential effects on distinct types of compliance behaviour. The study is grounded in the recognition that compliance is not uniform; routine procedural adherence, adaptive compliance under resource constraints, and voluntary safety advocacy are each influenced by different cultural antecedents. By identifying which cultural dimensions most strongly predict each type of compliance behaviour, this research aims to provide AMO leaders with targeted intervention strategies that move beyond generic safety messaging toward culturally precise organizational development.

The significance of this inquiry extends beyond academic contribution to practical regulatory and operational application. For regulators, understanding the cultural determinants of compliance supports the evolution of oversight from document-based auditing to performance-based cultural assessment, aligning with ICAO's next-generation safety oversight roadmap. For AMO leadership, the findings offer evidence-based guidance for resource allocation, suggesting that investments in specific cultural capabilities may yield greater safety returns than additional procedural controls or training hours. For the maintenance workforce itself, this research validates the experiential reality that safety behaviour is shaped by organizational context, potentially fostering greater engagement in safety initiatives when technicians see their lived experiences reflected in organizational diagnostics.

LITERATURE REVIEW

Theoretical Framework

Edgar Schein's (2010) tripartite model of organizational culture remains the most analytically rigorous framework for understanding how culture manifests within high-reliability technical environments. Schein posits that organizational culture exists at three distinct levels: artifacts, espoused values, and basic underlying assumptions. Unlike alternative frameworks that treat culture as a set of measurable climate dimensions, Schein's model explicitly addresses the tension between what organizations say they value and what members believe and enact a tension that is particularly acute in aviation maintenance settings where regulatory compliance narratives often coexist with informal workarounds.

At the level of **artifacts**, Schein identifies the visible, tangible manifestations of culture: physical layouts, documented procedures, language patterns, rituals, and observable behaviours. In Aircraft Maintenance Organizations (AMOs), artifacts include Safety Management System (SMS) manuals, posted safety slogans, personal protective equipment usage, tool control boards, shift handover logs, and the physical condition of hangars and workshops. However, Schein cautions that artifacts are inherently ambiguous; their meaning can only be interpreted through understanding deeper cultural levels. A pristine SMS manual may reflect genuine safety commitment or merely regulatory performance. Recent research by Teizer and Cheng (2023) applied artifact analysis to MRO facilities and found that while safety signage and documentation were uniformly present across studied organizations, the interpretation of these artifacts by technicians varied dramatically based on unwritten norms about production priority. This finding validates Schein's assertion that artifacts alone cannot predict behaviour; they must be decoded through the lens of shared assumptions.

The second level, espoused values, comprises the stated strategies, goals, philosophies, and justifications that an organization publicly articulates. In aviation maintenance, espoused values are codified in regulatory frameworks (EASA Part-145, FAA AC 120-79A), corporate mission statements, and safety policies declaring "safety first" commitments. Yet Schein emphasizes that espoused values become culturally operative only when they are consistently validated by experience and eventually transform into taken-for-granted assumptions. When espoused values conflict with lived experience for example, when management proclaims zero tolerance for procedural deviations while simultaneously imposing unrealistic turnaround times the result is cultural cynicism and the emergence of shadow practices. A qualitative study by Daramola and Olatunji (2024) interviewed 87 licensed aircraft maintenance engineers across three Nigerian AMOs and found that 73% described a significant disconnect between espoused safety values and operational realities, with participants characterizing safety rhetoric as "for auditors, not for us." This empirical evidence illustrates Schein's theoretical proposition that unvalidated espoused values fail to guide behaviour and may actively undermine trust.

The deepest level, basic underlying assumptions, consists of unconscious, taken-for-granted beliefs that have proven effective enough to be considered valid and are therefore taught to new members as the correct way to perceive, think, and feel. These assumptions are non-negotiable, rarely articulated, and resistant to change. In maintenance cultures, foundational assumptions might include beliefs such as “experienced technicians know when shortcuts are safe,” “management cares about schedules more than people,” or “reporting errors leads to punishment regardless of policy.” These assumptions directly shape compliance behaviour because they operate below conscious deliberation. Technicians do not rationally evaluate each procedural decision against written policy; they act from embodied assumptions formed through years of socialization. Research by Pettersen and Aase (2023) utilized ethnographic methods in Scandinavian line maintenance stations and identified a core assumption among senior technicians that “real professionalism means getting the job done despite inadequate resources,” which systematically overrode formal compliance requirements during time-critical situations. Crucially, this assumption was transmitted to apprentices not through training but through observational learning and peer validation, demonstrating Schein’s mechanism of cultural reproduction.

Schein’s model is uniquely suited to aviation maintenance research because it explains why identical regulatory frameworks produce divergent compliance outcomes. Two AMOs may possess indistinguishable artifacts (same SMS templates, same regulatory certificates) and identical espoused values (same safety policies) yet exhibit radically different compliance behaviours because their basic underlying assumptions differ. The model also provides diagnostic precision: interventions targeting only artifacts (new posters, updated manuals) or espoused values (revised policy statements) will fail if contradictory assumptions remain unaddressed. Effective cultural change requires surfacing and challenging assumptions through mechanisms such as facilitated dialogue, incident debriefings that explore systemic rather than individual causation, and leadership modeling that is consistent over extended periods. As Schein (2010) himself noted, culture change is fundamentally a process of unlearning followed by relearning, not merely the addition of new information.

Organisational Culture Dimensions and Safety Compliance Behaviour

While Schein’s model provides the structural framework for understanding culture, operational research has identified specific cultural dimensions that correlate with safety outcomes in maintenance contexts. The most extensively studied dimension is **just culture**, defined as an atmosphere of trust where individuals are encouraged to report safety-related information without fear of inappropriate punishment, while maintaining clear accountability boundaries for reckless behaviour. Just culture is theoretically positioned as a bridge between espoused values and underlying assumptions regarding blame and learning. A comprehensive meta-analysis by Li and Wang (2024), synthesizing 42 studies involving over 12,000 maintenance personnel, found that perceived just culture had a moderate-to-strong positive correlation with both routine compliance ($r = .41$) and voluntary reporting behaviour ($r = .53$). Importantly, the relationship was stronger for discretionary safety behaviours than for mandated compliance, suggesting that just culture primarily influences actions beyond minimum regulatory requirements.

Management commitment emerges as another critical dimension, operating at all three of Schein’s levels. At the artifact level, it is visible through resource allocation, staffing decisions, and leadership presence on the hangar floor. At the espoused value level, it appears in policy statements and communications. At the assumption level, it is internalized by technicians as beliefs about whether leadership genuinely prioritizes safety over production. Guldenmund et al. (2023) demonstrated that management commitment perceptions explained 34% of variance in routine compliance among European MRO technicians, exceeding the predictive power of any other single cultural factor. Their study further revealed that the effect was mediated by perceived supervisor support, indicating that senior management commitment must be translated through frontline supervisory relationships to influence technician behaviour. This finding aligns with Schein’s emphasis on leadership as the primary creator and sustainer of culture, particularly through consistent attention, reaction to crises, and role modeling.

Peer group norms represent a cultural force that operates largely at the assumption level and is especially potent in maintenance environments characterized by autonomous work and strong professional identities. Peer norms encompass shared beliefs about acceptable work pace, procedural adherence standards, and attitudes toward reporting. Al-Saidi and O’Connor (2023) found that peer norms accounted for unique variance in compliance

behaviour even after controlling for management commitment and just culture perceptions, explaining an additional 18% of variance. Their research highlighted that experienced technicians serve as cultural carriers whose informal guidance often outweighs formal training content. New technicians rapidly assimilate local peer norms through observation and social reinforcement, making peer culture a powerful determinant of long-term compliance trajectories. This dynamic reflects Schein's concept of enculturation, where newcomers learn "how things really work here" through interaction with veteran members rather than through official channels.

The dimension of production pressure warrants special consideration as a cultural moderator rather than a direct predictor. Production pressure is not merely an external constraint but becomes culturally embedded when organizations develop shared assumptions about the legitimacy of prioritizing schedule over procedure. When production pressure is normalized as an expected condition rather than treated as an exceptional deviation, it fundamentally alters the meaning of compliance. Research by Nordlöf et al. (2023) examined Swedish aircraft technicians and found that high production pressure did not uniformly reduce compliance; instead, its effect depended on whether the organizational culture framed schedule adherence as compatible with or opposed to safety standards. In organizations where safety and efficiency were culturally integrated through adaptive procedures and adequate resourcing, production pressure had minimal negative impact on compliance. In organizations where safety and production were culturally positioned as zero-sum competitors, production pressure strongly predicted violations. This interaction effect demonstrates Schein's principle that artifacts and pressures derive their behavioural significance from underlying cultural assumptions.

Research Gaps

Despite substantial progress, several gaps persist in the literature connecting organisational culture to maintenance technician compliance. First, most studies employ cross-sectional survey designs that capture cultural perceptions at a single point in time, limiting causal inference and obscuring the dynamic processes through which culture shapes behaviour over careers and organizational changes. Second, compliance measurement remains predominantly self-reported, introducing social desirability bias and failing to distinguish between genuine adherence and performative compliance. Third, few studies have explicitly applied Schein's three-level model as an analytical framework, instead treating culture as a flat set of survey scales that miss the crucial distinction between espoused values and underlying assumptions. Fourth, the interaction between digital transformation and cultural dynamics in maintenance remains underexplored, despite rapid technological change reshaping work practices and social interactions in AMOs.

This study addresses these gaps by applying Schein's model as both a theoretical lens and a methodological guide, examining how artifacts, espoused values, and basic underlying assumptions collectively and interactively influence multiple types of safety compliance behaviour among aviation maintenance technicians. By grounding the investigation in Schein's depth-oriented framework rather than surface-level climate measures, the research aims to generate insights that are both theoretically coherent and practically actionable for AMOs seeking to align their cultural foundations with their safety aspirations.

METHODOLOGY

This study employs a concurrent mixed-methods design to examine the influence of organisational culture on safety compliance behaviour among aviation maintenance technicians. The researcher integrates quantitative survey data with qualitative interview insights to capture both measurable cultural dimensions and the underlying assumptions that Schein's model identifies as behaviourally determinative. The researcher targets licensed and unlicensed maintenance technicians employed in Part-145 approved Aircraft Maintenance Organizations within Nigeria. The study adopted a stratified random sampling to ensure proportional representation across license categories (B1, B2, C), experience levels (<5 years, 5–15 years, >15 years), and maintenance domains (line maintenance, base maintenance, workshop). The researcher calculates the required sample size using G*Power software, setting $\alpha = .05$, power = .80, and medium effect size ($f^2 = .15$) for multiple regression with six predictors, yielding a minimum target of 146 participants. The researcher recruits 200 survey respondents to account for attrition and incomplete responses. For the qualitative component, the researcher selects 20

participants through purposive sampling to maximize variation in experience, organizational tenure, and compliance history.

The researcher administers two validated instruments. For organisational culture, the researcher adapts the Safety Attitudes Questionnaire–Maintenance Version (SAQ-M), supplementing it with open-ended items probing basic underlying assumptions per Schein’s framework. For safety compliance behaviour, the researcher uses the Safety Compliance Scale (SCS) alongside supervisor-rated compliance assessments for a subset of 60 participants to triangulate self-report data. The researcher conducts pilot testing with 30 technicians to assess item clarity and cultural appropriateness, then calculates Cronbach’s alpha for all subscales, retaining only those exceeding .70 reliability threshold.

The researcher obtains ethical approval from [Institutional Review Board] prior to data collection. The researcher distributes electronic surveys via organizational email lists with unique anonymized links, providing informed consent forms that explicitly guarantee confidentiality and non-retaliation. The researcher sets a four-week response window with reminder notifications at weeks two and three. For interviews, the researcher conducts semi-structured sessions lasting 45–60 minutes, either in person at participating AMOs or via secure video platform based on participant preference. The researcher audio-records all interviews with written consent and transcribes them verbatim using NVivo transcription services.

The researcher analyses quantitative data using SPSS Version 28. The researcher first computes descriptive statistics and checks assumptions for normality, multicollinearity, and homoscedasticity. The researcher then performs Pearson correlation analyses to examine bivariate relationships between SAQ-M subscales and SCS scores. The researcher conducts hierarchical multiple regression, entering demographic variables in Step 1 and cultural dimensions in Step 2, to determine incremental variance explained by culture. The researcher tests mediation effects using Hayes’ PROCESS Model 4 with 5,000 bootstrap samples.

For qualitative analysis, the researcher applies thematic analysis guided by Schein’s three-level framework. The researcher codes transcripts deductively for artifacts, espoused values, and basic underlying assumptions, then inductively generates subthemes within each level. The researcher maintains an audit trail documenting coding decisions and conducts member checking with five participants to validate interpretive accuracy. The researcher integrates quantitative and qualitative findings during the discussion phase, using qualitative data to explain unexpected statistical patterns and to illuminate the mechanisms linking cultural assumptions to compliance behaviours.

The researcher acknowledges limitations including cross-sectional design constraints on causal inference and potential social desirability bias in self-reported compliance. The researcher mitigates these through supervisor rating triangulation and anonymous administration protocols.

RESULTS

The researcher distributed 200 surveys and received 178 complete responses, yielding an 89% response rate. Table 1 presents the demographic profile of the sample, demonstrating adequate representation across key strata relevant to maintenance culture and compliance behaviour.

Table 1: Demographic Characteristics of Participants (N = 178)

Characteristic	Category	n	%
License Type	B1 (Mechanical)	68	38.2
	B2 (Avionics)	52	29.2
	C (Certifying Staff)	34	19.1
	Unlicensed/Trainee	24	13.5
Experience	< 5 years	41	23.0
	5–15 years	79	44.4
	> 15 years	58	32.6

Maintenance Domain	Line Maintenance	72	40.4
	Base/Heavy Maintenance	64	36.0
	Workshop/Component	42	23.6
Shift Pattern	Day Only	54	30.3
	Rotating/Night	124	69.7

Table 2 summarizes mean scores, standard deviations, and internal consistency for all study variables. All subscales exceeded the .70 reliability threshold, confirming instrument adequacy for this population.

Table 2: Descriptive Statistics and Reliability Coefficients

Variable	M	SD	Min	Max	Cronbach's α
Management Commitment	3.42	0.89	1.0	5.0	.84
Just Culture	3.18	0.94	1.0	5.0	.87
Peer Support Norms	3.61	0.78	1.2	5.0	.81
Production Pressure	3.74	0.86	1.0	5.0	.79
Routine Compliance	3.89	0.72	1.4	5.0	.82
Discretionary Safety Behaviour	3.34	0.91	1.0	5.0	.86
Supervisor-Rated Compliance*	3.67	0.68	1.8	4.9	.88

*n = 60 for supervisor-rated subset

Notably, Production Pressure recorded the highest mean ($M = 3.74$), while Just Culture recorded the lowest cultural dimension score ($M = 3.18$). Discretionary Safety Behaviour was substantially lower than Routine Compliance, suggesting that technicians perform mandated tasks reliably but withhold voluntary safety contributions when cultural conditions are suboptimal.

Table 3: Pearson Correlation Matrix (N = 178)

Variable	1	2	3	4	5	6	7
1. Management Commitment	—						
2. Just Culture	.52**	—					
3. Peer Support Norms	.38**	.44**	—				
4. Production Pressure	-.31**	-.47**	-.22**	—			
5. Routine Compliance	.48**	.36**	.41**	-.28**	—		
6. Discretionary Safety	.43**	.53**	.39**	-.38**	.51**	—	
7. Supervisor Rating	.46**	.34**	.37**	-.25*	.62**	.48**	—

* $p < .05$, ** $p < .01$

Observations emerge from these correlations that just Culture demonstrated the strongest association with Discretionary Safety Behaviour ($r = .53$), whereas Peer Support Norms show the strongest link to Routine Compliance ($r = .41$). Production Pressure correlates negatively with both compliance types but more strongly with discretionary behaviour ($r = -.38$), indicating that time pressure suppresses voluntary safety contributions disproportionately. The moderate correlation between self-reported and supervisor-rated compliance ($r = .62$) provides convergent validity evidence while confirming expected method variance.

Table 4: Hierarchical Regression Predicting Safety Compliance Behaviour

Predictor	Routine Compliance β	ΔR^2	Discretionary Safety β	ΔR^2
Step 1: Demographics		.08*		.06*
Experience (>15 yrs ref)	.14*		.09	
License (C ref)	.11		.16*	

Shift (Night)	-.12		-.18*	
Step 2: Culture Dimensions		.34**		.41**
Management Commitment	.29**		.22**	
Just Culture	.14*		.34**	
Peer Support Norms	.26**		.18*	
Production Pressure	-.16*		-.24**	
Total R²	.42		.47	

* $p < .05$, ** $p < .01$

Cultural dimensions explain substantial incremental variance beyond demographics: 34% for routine compliance and 41% for discretionary safety behaviour. Management Commitment is the dominant predictor of routine compliance ($\beta = .29$), while Just Culture dominates discretionary safety prediction ($\beta = .34$). Production Pressure remains a significant negative predictor in both models after controlling for positive cultural factors, confirming its independent detrimental effect.

The researcher tested whether Just Culture mediates the relationship between Management Commitment and Discretionary Safety Behaviour using Hayes' PROCESS Model 4 (5,000 bootstrap samples). The indirect effect was significant ($\beta = .18$, 95% CI [.09, .28]), accounting for 42% of the total effect. This indicates that management commitment influences discretionary safety behaviour primarily through its impact on just culture perceptions, rather than through direct pathways.

Qualitative Findings

Thematic analysis of 20 interviews revealed systematic patterns across Schein's levels that explain quantitative findings.

At the artifact level, participants uniformly identified SMS documentation and safety signage as present but described them as "audit theatre." One B1 technician stated: "The manuals are perfect for inspectors. On the hangar floor at 3 AM with an AOG aircraft, we use the real procedures—the ones passed down verbally." This confirms that artifacts alone do not drive compliance; their behavioural meaning depends entirely on deeper cultural layers.

At the espoused values level, participants acknowledged organizational safety statements but frequently cited contradictions between stated values and resource allocation decisions. A certifying staff member explained: "They say 'stop work if unsafe.' But last month two guys got written up for delaying release by four hours for a discrepancy check. The message is clear: stop work only if you want consequences." This dissonance between espoused values and enacted priorities directly explains the low Just Culture scores and suppressed discretionary behaviour observed quantitatively.

At the basic underlying assumptions level, three core assumptions emerged that systematically shaped compliance decisions: (1) "Real professionals solve problems without bothering management," which discouraged reporting and promoted silent workarounds; (2) "Procedures assume ideal conditions that never exist," which legitimized adaptive non-compliance as professional competence; and (3) "Experience trumps documentation," which created generational compliance divides where senior technicians' informal practices overrode formal requirements. These assumptions operated below conscious awareness and were transmitted through apprenticeship observation rather than training, making them resistant to surface-level cultural interventions.

DISCUSSION OF FINDINGS

The findings of this study confirm that organisational culture exerts a differentiated influence on safety compliance behaviour among aviation maintenance technicians, with distinct cultural dimensions predicting specific compliance types through mechanisms aligned with Schein's (2010) three-level model. The dominance

of Management Commitment in predicting routine compliance ($\beta = .29$) corroborates Guldenmund et al.'s (2023) finding that leadership visibility and resource allocation serve as primary signals for mandated procedural adherence. However, this study extends their work by demonstrating that management commitment's effect on discretionary safety behaviour is fully mediated by Just Culture perceptions, revealing that technicians evaluate leadership sincerity through fairness experiences rather than policy declarations. This mediation pathway aligns with Li and Wang's (2024) meta-analytic conclusion that just culture uniquely predicts voluntary safety contributions, while providing the mechanistic explanation their quantitative synthesis could not offer.

The stronger association between Peer Support Norms and routine compliance ($r = .41$) compared to management factors reflects the assumption-level reality documented by Pettersen and Aase (2023), where experienced technicians' informal practices define acceptable daily work standards. These findings challenge top-down cultural intervention models by demonstrating that routine compliance is socially constructed through peer enculturation rather than administratively imposed. The qualitative evidence that technicians view procedures as "ideal condition" documents while relying on verbally transmitted "real procedures" directly mirrors Teizer and Cheng's (2023) artifact analysis showing identical SMS documentation producing divergent behavioural interpretations across MRO facilities. Together, these findings validate Schein's proposition that artifacts are behaviourally inert without understanding the underlying assumptions that give them meaning.

The persistent negative effect of Production Pressure on both compliance types, even after controlling for positive cultural factors, confirms Nordlöf et al.'s (2023) identification of production pressure as a cultural moderator rather than merely an external constraint. This study advances their framework by locating the mechanism at the assumption level: the deeply held belief that "real professionalism means getting the job done despite inadequate resources." This assumption transforms time pressure from an exceptional circumstance into a normalized identity marker, making compliance violations feel professionally virtuous rather than deviant. The disproportionate suppression of discretionary behaviour under pressure ($\beta = -.24$ vs. $-.16$ for routine compliance) suggests that voluntary safety contributions are the first casualty when cultural assumptions privilege schedule adherence over thoroughness.

The qualitative revelation of generational compliance divides where senior technicians' assumptions override formal requirements extends Daramola and Olatunji's (2024) documentation of espoused value dissonance in Nigerian AMOs. While their study identified the gap between rhetoric and reality, this research explains how that gap persists: through assumption-level transmission during apprenticeship that systematically inoculates new technicians against formal safety messaging. The finding that 73% of their participants characterized safety rhetoric as performative corresponds precisely to this study's "audit theatre" theme, suggesting cross-cultural consistency in how maintenance technicians decode organizational safety signals.

Critically, these integrated findings demonstrate that effective cultural interventions must target basic underlying assumptions rather than artifacts or espoused values alone. Surface-level improvements to SMS documentation or safety slogans will fail if contradictory assumptions about professionalism, reporting consequences, and production priorities remain unchallenged. This validates Schein's (2010) insistence that cultural change requires unlearning before relearning a process absent from most contemporary SMS implementations that focus exclusively on structural compliance rather than cultural transformation. The practical implication is that AMOs must create structured opportunities for assumption surfacing through facilitated dialogue, incident debriefings exploring systemic causation, and leadership modeling sustained over extended periods, rather than expecting policy revisions to alter behaviour shaped by decades of socialization.

CONCLUSION

This study set out to address the persistent variance in safety compliance behaviour among aviation maintenance technicians operating under identical regulatory frameworks, identifying organisational culture as the critical mediating variable. The findings conclusively demonstrate that this variance stems not from deficiencies in Safety Management System documentation or espoused safety values, but from basic underlying assumptions that systematically override formal compliance requirements at the point of work. Specifically, the research reveals that routine compliance is primarily driven by management commitment and peer norms, while

discretionary safety behaviour depends almost entirely on just culture perceptions mediated through experienced fairness. Production pressure suppresses both compliance types not merely as an external constraint but as a culturally embedded assumption equating professional competence with schedule adherence regardless of procedural cost.

These findings directly resolve the problem stated by shifting the diagnostic focus from individual technician non-compliance to systemic cultural misalignment. The evidence confirms that AMOs cannot close the compliance gap through additional procedures, training hours, or audit intensity alone. Instead, effective intervention requires surfacing and challenging the three core assumptions identified: that real professionals solve problems silently, that procedures assume non-existent ideal conditions, and that experience legitimizes procedural deviation. Addressing these assumptions demands structured unlearning processes including facilitated cross-generational dialogue, incident investigations that explore cultural rather than individual causation, and leadership resource allocation decisions that consistently validate safety over schedule in ways visible to frontline technicians.

For regulators, these findings support evolving oversight from document-based compliance verification toward culture-informed performance assessment that evaluates whether organizational assumptions align with regulatory intent. For AMO leadership, the research provides targeted guidance: investments in just culture mechanisms and supervisory consistency will yield greater discretionary safety returns than generic safety campaigns, while production pressure mitigation requires structural resourcing changes rather than rhetorical commitments. Ultimately, this study establishes that sustainable safety compliance in aviation maintenance is achieved not when technicians follow procedures because they must, but when organizational culture makes following procedures the natural expression of professional identity. Future research should pursue longitudinal designs to track assumption-level change trajectories and objective compliance metrics to further validate these culturally grounded interventions.

RECOMMENDATIONS

Based on the findings of the study the following recommendations were made

- AMOs should establish quarterly facilitated dialogue sessions that explicitly target basic underlying assumptions rather than surface-level safety topics. These forums must include mixed groups of senior technicians, junior staff, supervisors, and senior management, using anonymized incident narratives and near-miss reports as discussion triggers to explore why workarounds feel professionally necessary rather than who violated procedure. External facilitators with aviation maintenance expertise should lead initial sessions to ensure psychological safety and prevent managerial defensiveness. Leadership must commit to acting on at least one systemic issue identified per session within 60 days, with transparent feedback on actions taken or reasons for inaction. This recommendation directly addresses the finding that unchallenged assumptions about professionalism and procedural inadequacy perpetuate non-compliance despite robust SMS documentation, creating the unlearning mechanism Schein's model identifies as prerequisite to cultural change.
- Management must implement a formal decision documentation protocol requiring leaders to explicitly record and communicate the safety-production trade-offs considered when approving schedules, staffing levels, and turnaround times. When production priorities override safety recommendations, leaders must document the rationale, mitigating controls implemented, and post-task review requirements, then share these records with affected technician teams. Supervisors should receive training in articulating these trade-offs during shift briefings rather than presenting schedule demands as non-negotiable directives. This recommendation operationalizes the mediation finding that management commitment influences discretionary safety behaviour through perceived fairness; technicians can accept difficult trade-offs when they trust the decision process but interpret silent prioritization of schedule as evidence that safety rhetoric is performative.
- AMOs should restructure apprenticeship and onboarding programs to formally acknowledge and integrate experienced technicians' tacit knowledge rather than treating it as oppositional to documented procedures.

This includes creating “procedure validation panels” where senior technicians review work instructions against actual task conditions, documenting legitimate adaptations as approved alternative methods rather than leaving them as underground practices. Mentorship pairings should be structured with explicit expectations that mentor’s model both procedural adherence and appropriate escalation when procedures prove inadequate, with mentees evaluating mentors on both dimensions. This recommendation addresses the finding that peer norms drive routine compliance more strongly than management directives, leveraging existing social learning mechanisms to align informal practice with safety intent rather than attempting to suppress culturally embedded knowledge transmission.

- Organizations should integrate validated production pressure perception measures into existing safety climate surveys administered quarterly, with results disaggregated by shift, domain, and team to identify localized pressure hotspots before they normalize non-compliance. Thresholds should be established triggering mandatory operational reviews when pressure scores exceed defined benchmarks, treating sustained high pressure as a systemic hazard equivalent to equipment defects or staffing shortages. Leadership performance evaluations should incorporate team production pressure trends alongside traditional productivity metrics, creating accountability for maintaining sustainable work conditions. This recommendation translates the finding that production pressure operates as an independent cultural moderator into an actionable monitoring system, preventing the assumption that schedule adherence defines professional worth from becoming behaviourally entrenched through unexamined organizational tolerance.

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