

Risk Beyond Doctrine II – An Empirical Study of NATO’s Risk Management integration in Decision-Making.

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This study investigates how NATO military headquarters integrate risk management into decision-making during ongoing operations, complementing earlier research on planning. Over 14 months, the authors conducted about 800 hours of non-participant ethnographic observation across seven headquarters and 27 interviews with key personnel. Findings reveal two concurrent “risk pathways.” Formal processes through Assessment Boards, Risk Working Groups and Joint Coordination Boards which provide structured, traceable mechanisms. Alongside these, tacit practices such as informal adaptations, anticipatory reorganization, cross-functional discussions and leadership framing embed risk thinking in daily routines without explicit terminology. Risk deliberation appeared across nearly all headquarters activities, especially working groups and senior-level updates, but many issues raised informally never entered official registers. Leadership emphasis, staff preparation and dialogue enabled effective risk management, while checklist mentalities, training gaps, bureaucratic filtering and the need for resource trade-offs constrained it. Overall, NATO’s risk management is more pervasive than doctrine prescribes but lacks mechanisms to reliably connect informal practices with formal processes, limiting visibility and continuity of risk decisions.

Keywords: Doctrine, Risk Management, Decision-Making, NATO

1. Introduction

This paper is written as part of the NATO Risk Propensity Project to complement its previously published paper ‘Risk Beyond Doctrine – An Empirical Study of NATO’s Risk Management Integration in Planning’. The earlier work considered risk management as an element in operational planning. This paper explores risk management in decision making during operations. To maintain consistency, this paper adopts the same formatting and structure as its predecessor, as both papers represent two parts of the same research. However, to ensure it can be read as a standalone study, some theoretical and empirical content from the previous paper is reiterated in this paper.

The overall research aims examine if, and if so how, contemporary risk science can contribute to the enhancement of NATO’s planning and decision-making processes. Recognizing NATO’s enduring responsibility to uphold collective defense and readiness for conflict and acknowledging the persistent presence of risk in military operations, it is imperative that risk

considerations are fully integrated into NATO’s decision-making mechanisms to maintain credibility (NATO 2022). Accordingly, this paper explores how risk management is incorporated within decision-making processes at NATO military headquarters (HQ), drawing on observations from large-scale computer assisted command post exercises. The following research question underpins this study: How is Risk Management being conducted as part of decision making in NATO HQ?

2. Theoretical and Professional Context

2.1. Theoretical foundation

While recognizing the diversity of perspectives on the conceptual framing of risk and subsequent approaches to its management this paper leverages the capstone conceptualizations of professors Terje Aven, Shital Thekdi and The Society for Risk Analysis. Herby risk is defined as ‘the consequences of the activity and associated uncertainties’ (Aven and Thekdi 2022, 11; Aven et al. 2018, 4) and its management as ‘all activities to address risk’ (Aven & Thekdi,

2022, p. 201). It is normal to think of such activities as prevention, mitigation, adaptation and sharing with relation to Risk Management, but it also includes developing strategies and choosing principals to guide said management (Aven et al. 2018; Aven and Thekdi 2022). In the spirit of general applicability and brevity this paper will be focusing on the overall and generic managerial process of risk management depicted in figure 1.

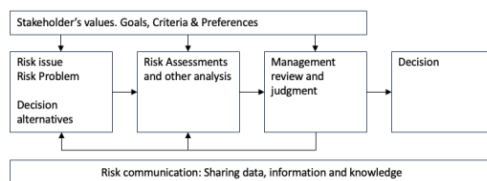


Figure 1 – Aven and Thekdi (2022, 202) model for Risk Management.

This model frames risk management as process where ‘a management decision [related to risk] is the end result of a four-stage process based on stakeholder’s values, goals, criteria and preferences’ (Solli and Borrie 2025b, 1918). This management processes accords with the Society for Risk Analysis’ definition of risk management which states that it often includes trade-offs between costs and benefits of risk reduction and choice of a level of tolerable risk’ (Aven et al., 2018, p. 8).

2.2. Professional Context

This research explored the decision-making process described in NATO’s doctrine for the conduct of operations, the ‘HQ’s decision cycle’. The doctrinal guidance is individually operationalized in Standard Operations Procedures (SOP) to each respective HQ. The following is an amalgamation of both doctrine and SOPs from NATO HQs to provide generally accepted description of the process. With respect to risk management, it is prudent to mention that NATO doctrine does not align its description of risk management with its own decision-cycle (Solli and Borrie 2025b; 2025a). The prescribed decision-cycle includes scheduled opportunities for formal assessment of risk but previous research shows that risk considerations often surface through informal practices and cross-functional discourse (NATO 2019; Solli and Borrie 2025a). This distinction between tacit and

formal risk management activities forms a critical analytical lens in the discussion presented later in this paper. A more thorough description of this process and its relationship with risk management can be read in our paper ‘Interoperability Challenges in NATO’s Risk Management: Insights from Procedural and Conceptual Analysis’ (Solli and Borrie 2025a).

Prior to describing the mechanics and content of the decision-making process it is important to explain that military HQ at any given time operate on three distinctly different time horizons, simply labelled current operations, mid-term decision-making and long-term planning time horizons. This can be illustrated by three differently sized cogs. The smallest cog, representing current operations, rotates the fastest, while the largest cog, representing long-term planning, turns the slowest. The focus of this paper is the mid-term decision-making time horizon that serves as a bridge between the deliberate long-term planning and the management of the rapidly developing current operations. The way NATO HQ operationalize the doctrinal ‘HQ’s decision cycle’ to manage the mid-term planning horizon is commonly referred to as the JCO-cycle. This comes from the output of the decision-making cycle being a ‘Joint Coordination Order’ (JCO) issued to the subordinate forces following the commanding officer’s decisions made at the end of the cycle to make adjustments and amplifying guidance to the ongoing operation.

The JCO-cycle is structured as a schedule of activities designed to facilitate the HQ staff and mid-level leadership’s work enabling the commanders decision-making related to ongoing operations. This schedule consists of two types of ‘activities’, working groups and boards. Working groups are normally organized by functional area issues to support the development of the JCO and other headquarters processes. They serve as a forcing function to achieve a whole of headquarters cross functional workflows. Boards are typically divided into two groups. Command boards are chaired by the commander, who makes decisions. These include the Assessment Board and the JCO Board. Functional area boards where mid-level leaders make decisions related to their level of authority including what to elevate to the JCO Board (NATO 2019; Munin 2023; Fenris 2023; Solli 2024; Solli and Borrie 2025a).

Figure 2 depicts an example of how a mid-term decision cycle can be organized based on doctrine, directives and standards operations procedures.

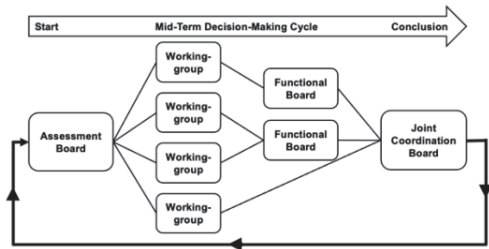


Figure 2 – NATO HQ’s Decision- / JCO-Cycle

Each decision-cycle starts with an Assessment Board where the commander receives the operational assessment of the ongoing operation including the operational risk picture. However, the systematic inclusion of structured risk analysis at this stage is not consistently mandated by doctrine (Solli and Borrie 2025a; NATO 2019). Following the assessment board several functional area working groups are scheduled to focus the efforts for the staff. Some of these functional working groups feed into corresponding functional boards. Then a JCO Working group can be conducted to facilitate the synthesis of outcomes of functional working groups and boards. This culminates in the Joint Coordination Board (JCB), where the commander receives a foundation for decision-making and makes final operational decisions reflected in the Joint Coordination Order (Munin 2023; Fenris 2023; NATO 2019). It is important to note that staff work will be conducted between these HQ activities (Solli 2024).

3. Methods of Research

This study builds on Solli and Borrie (2025b) utilizing the same dataset but with the inclusion of additional data while using a more developed analytical lens. While novel to new readers of this research the following will be familiar for those who have read the preceding paper.

This study is based on empirical material collected over a 14-month period during four large-scale NATO exercises. The data collection involved immersive qualitative research, including approximately 800 hours of non-participant observation across seven military HQ. Three HQs were primarily engaged in planning

future operations, while the remaining four were observed during operational execution phases.

The observational data were captured through detailed field notes, supplemented by 27 semi-structured interviews with military and civilian personnel occupying key planning and decision-making roles. In both observations and interviews particular attention was given to the ways in which risk management considerations were (or were not) integrated into decision-making processes.

A content analysis approach was employed to examine both qualitative and descriptive quantitative elements of the data (Zhang & Wildemuth, 2009). Although some numerical data are presented, they serve to contextualize patterns and are not statistically analyzed. The interview and observation data were processed using an iterative coding strategy: initial deductive categories were applied, followed by inductive coding to surfacing context-specific insights (Vears & Gillam, 2022; Zhang & Wildemuth, 2009). This analytic framework supports the exploratory nature of the research by allowing for both theory-driven and emergent themes to be recognized.

Acknowledging the responsibilities following the privileges as an insider researcher with respect to research ethics and military security demands the following was done to preserve confidentiality (Sjögren et al. 2024). All participant identities were anonymized. HQ were assigned codenames inspired by Norse mythology, and interviewees were randomly assigned playing card identities at the start of their interviews. This anonymization strategy ensured both clarity and consistency across data sources and all papers written as part of the research project.

Table 1 – List of observed HQ (Solli and Borrie 2025b)

Codename	Exercise Focus
HQ Hugin	Planning of operations
HQ Munin	Planning of operations
HQ Mjølner	Planning of operations
HQ Fenris	Conducting operations
HQ Loke	Conducting operations
HQ Gugne	Conducting operations
HQ Frøya	Conducting operations

Tables 1 is reproduced from Solli and Borrie (2025b) since this study builds upon the same data. Table 2 shows the interviewee base and highlights significant interviews completed after the 2025 paper was published. The inclusion of these tables ensures transparency and clarity.

Table 2 – List of interviewed research participants (Solli and Borrie 2025b)

Codename	Rank
Ten of Spades (10S)	NATO Civilian
Jack of Clubs (JC)	NATO Civilian
King of Diamonds (KD)	NATO Civilian
Five of Hearts (5H)	Major
Eight of Clubs (8C)	Major
Ten of Diamonds (10D)	Major
Four of Clubs (4C)	Lieutenant Colonel
Six of Diamonds (6D)	Lieutenant Colonel
Eight of Spades (8S)	Lieutenant Colonel
Nine of Clubs (9C)	Lieutenant Colonel
Ace of Spades (AS)	Lieutenant Colonel
King of Clubs (KC)	Lieutenant Colonel
Queen of Hearts (QH)	Lieutenant Colonel
Five of Clubs (5C)	Colonel
Seven of Clubs (7C)	Colonel
King of Spades (KS)	Colonel
Queen of Diamonds (QD)	Brigadier General
Three of Clubs (3C)	Major General
<i>Three of Spades (3S)</i>	<i>Major General</i>
Nine of Spades (9S)	Major General
<i>Jack of Spades (JS)</i>	<i>Major General</i>
<i>Ace of Clubs (AC)</i>	<i>Major General</i>
Seven of Hearts (7H)	Lieutenant General
<i>Jack of Hearts (JH)</i>	<i>Lieutenant General</i>
<i>King of Hearts (KH)</i>	<i>Lieutenant General</i>
<i>Ace of Hearts (AH)</i>	<i>Lieutenant General</i>
<i>Eight of Diamonds (8D)</i>	<i>General</i>

Interviewees added since Solli and Borrie (2025b) are listed in *italics*.

4. Findings

4.1 Observations

Actions contributing to, or enabling, management of risk were observed through a diverse array of HQ activities. These actions ranged from formalized risk assessments to subtle, embedded practices that support the decision-making process without explicit risk management labelling. The data clearly showed that risk management was not confined to formal risk management activities. Instead, there were two ‘risk pathways’ offering

explicit and tacit Risk Management activities. The explicit pathway consisted of the stated Risk Management activities. These are structured, traceable, and often tied to formal expectations or reporting lines where results from formal risk assessment are not only expected but required i.e. the Risk Working Groups, Assessment Working Groups and ultimately the Assessment Board. Tacit pathways were not visible unless one expressly looked for it, but it operated pervasively throughout the majority of the HQs’ decision cycle. It includes behaviors like informal adaptations, anticipatory reorganization of actions, concern-driven discussions, and subtle framing of issues without necessarily explicitly referring to them as ‘risks’. Several observations noted adjustments to the ongoing operation or communication of implicitly mitigated potential threats or addressed anticipated challenges. These tacit acts of communication, assessing or mitigating risk was a part of the normal day to day business.

This dual praxis reflects an organizational reality where not all of the HQ Decision Cycle activities addressing risk are understood to be or overtly leveraged to contribute to the HQ risk management. For the most part it appears that risk is managed tacitly through activities mitigating challenges through various HQ activities. At the same time, despite being raised in formal activities with broad attendance, certain risks, and risk factors were not incorporated into the formal risk management process, even though staff had sufficient time and opportunity to do so.

A more nuanced picture of risk management emerged as five inductively derived themes were found in the data: Risk Deliberation, Operations Friction, Command Framing, Strategic Sensitivity and Coordination. Additionally, four HQ activities beyond those listed in the generic HQ decision cycle were observed during the data collection. These include the daily Situational update brief (SAB), Commander’s update brief (CUB), Commander to Commander (COM-to-COM) Video Teleconference (VTC) meeting and decision briefs. (see Table Y)

The SABs are conducted by operational-level HQ staff for the commanding officer. Typically, subordinate HQ commanders or senior leadership representatives participate virtually with key members if their HQ staff. CUB’s are normally

Table 3 – Decision-Making Cycle activities and inductive code mapping

Inductive Theme Codes	Situational Update Brief	Commander Update Brief	Commander to Commander	Working Groups	Boards and Decision Briefs
Risk Deliberation	77%	86%	80%	94%	82%
Operations Friction	31%	29%	0%	6%	2%
Command Framing	23%	71%	80%	6%	53%
Strategic Sensitivity	15%	29%	40%	24%	53%
Coordination	4%	29%	20%	24%	6%

Percentage of observations from the respective HQ activities coded with the inductive themes

conducted daily at each HQ for its respective commander. COM-to-COMs were held on an every-other-day basis or ad hoc, depending on the commanders’ availability and operational priorities. Current affairs or approval of tasked missions are observed to be granted decision briefs to the commander in parallel to the JCO-cycle.

Table 3 provides an overview of the frequency with which each theme was observed within different activities in the decision cycle. Single observations were often coded for more than one theme. This table offers critical insights into the perpetual presence of both explicit and tacit risk management thinking in NATO HQ processes and activities.

Risk Deliberation emerged as the most consistently observed theme across all HQ activities, with particularly high representation in Working Groups (94%), CUBs (86%), and COM-to-COM interactions (80%). This suggests that risk is frequently discussed, even when not part of formally designated risk processes. Risk, in these instances, is woven into operational discourse, indicating a pervasive culture of embedded vigilance about risk rather than exclusive reliance on structured risk assessments. However, it is important to note that most of risk deliberations did not explicit use risk terminology. Language used referred to risk factors such as threats, probability assumptions, potential adverse consequence descriptions, vulnerabilities, imbalance between resources and plans and so forth. *Operations Friction* primarily surfaced in Situational Update Briefs (31%) and CUBs (29%), but was virtually absent from to COM-to-COM meetings (0%) and Boards (2%). *Command Framing* was strongly present in high-level communication forums, COM-to-COM (80%) and CUBs (71%), underscoring the role of senior leaders in shaping

how issues are understood and prioritized. *Strategic Sensitivity* appeared most frequently in Boards and Decision Briefs (53%) and COM-to-COM (40%). Finally, *Coordination* was the least coded theme overall, but showed greater presence in CUBs (29%) and Working Groups (24%),

4.2 Interviews

During the research critical reflection on the interview process led to the refinement of one question, making it more structured. As a result, thirteen interviewees received the revised question, providing more specific and targeted insights. Subsequently twelve of the interviewees were explicitly asked whether they experienced specific activities or types of activities occurring within the HQ’ decision cycle contribute to risk management for the HQ and its commander. With the same question was framed more open ended for the remaining interviewees. Their responses are summarized in Table 4. The level of endorsement varies by activity. Working Groups attracted the most conditional views with six interviewees affirming their contribution and five stating that their value was contingent upon factors such as staff training, preparation, or leadership emphasis (KC, KS, 5C, 8D, 10D). Assessment Boards, Joint Coordination Boards, and Crisis Action Teams received almost unanimous endorsement, with only isolated reservations linked to the perceived quality of supporting inputs (AC, AH). Functional Boards were viewed positively by most respondents, though concern related to bureaucratic processes and that the value of these forums could be compromised if the flow of information was incomplete or diluted (3C, 4C, 7C, AC, JC, JS, JH). Furthermore, a concern that some commanders find risk overwhelming to the extent that it can cause decision paralysis was also raised (8D, AH, KH).

Among the remaining interviewees who were asked more open-ended questions about HQ activities contributing to risk management, the importance of decision-cycle events that facilitate cross-functional dialogue was emphasized (8S, JC, JS). This was not always linked to formalized risk processes. Six respondents expressed support to the importance of the decision-making process with regards to risk management, irrespective of whether the activity is formally labelled as such (8C, 9S, AC, AS, JC, JH, KH). These perspectives align with the dual praxis noted in observations where risk considerations flow both through formalized channels such as Assessment Boards and Joint Coordination Boards and through tacit practices embedded in commander interactions, working-level discussions, and synchronization meetings. Participants described how risk is fundamentally the commander's business (8S, AC, AH, AS, JS), and present in all operational activities (8S, AC, AH, AS). Several interviewees express views of risk as something that permeates operations (3S, 8C, 9S, AS) while others described risk as addressed whenever the HQ adapts or reprioritizes in response to operational realities (6D, 9C, 10S, JH, KD). These statements reflect the prevalence of risk deliberation in the interview dataset, where it appeared in a majority of the analyzed responses.

Several interviewees raised barriers to effective integration of risk management in the decision cycle with three respondents describing risk

management outputs as at times being reduced to "a slide" or "a checklist" (5H, 6D, JC, JH, QD, QH). Four interviewees specifically linked lower quality outputs to insufficient training among staff (8S, 9C, JC, QH). A particularly salient point from a senior leader was that risk mitigation is not free. As expressed in one interview, "you have to give up something" for a mitigating effect to be realized (7H). This reflects the reality that effective mitigation often requires a commander to prioritize actions, allocate resources differently, or even decide not to pursue certain actions. Several participants reinforced this perspective, noting that the decision to mitigate risk involves a deliberate trade-off that should be visible in the decision-making process (7H, 8D, 9C, 10S, JS, KH). Interviewee 8D reinforced the leadership perspective, by emphasized that shaping the future through calculated risk-taking, rather than simply mitigating threats, is a vital function of command. This view was shared by several interviewees (9C, AC, JH, KD, KS, QH). Interviewees perspectives varied in emphasis but reliably placed value on forums that allowed for comprehensive framing of operational issues. COM-to-COM meetings and Boards were particularly valued for shaping how the HQ prioritizes challenges and opportunities (9C, AH, AS, JH, JS, KD, KH).

5. Discussion

Based on the findings it appears that NATO HQs are conducting Risk Management through intertwined formal processes and tacit practices,

Table 4 – Decision-Making Cycle activities perceived to contribute to risk management by the interviewed personnel

Interviewed Person	Assessment Board	Working Group	Functional Board	Joint Targeting Board	Joint Coord. Board	Crisis Action Team
3C*			X		X	X
3S*	X	X	X	X	X	X
4C	X	X	X	X	X	X
5C	X	/	X	X	X	X
7H*	X	X	X	X	X	X
8D*	X	/			X	X
10D	X	/	X	X	X	X
JH	X	X	X	X	X	X
JS	X		X	X	X	X
KC	X	/	/	X	X	X
KH*	X	X	X	X	X	X
KS	X	/	X		X	X
AC*	X	X	X	X	X	X
AH*	X		X	X	X	
AS	X	X	X	X		

X = Yes, / = Partially or contingent upon caveats " " = No

across the decision-making activities. This suggests a gap between doctrine and practice that should be addressed in order to exploit the best of both formal and informal management of risk. This mirrors the finding of the first Risk Beyond Doctrine paper related to planning processes (Solli and Borrie 2025b). This study shows that risk management in NATO HQ cannot be understood solely through the lens of authoritative documents like doctrine. It is more than a limited process occurring within formal assessments and designated reviews. Observations and interviews demonstrate that risk considerations permeate almost all HQ activities. This indicates that HQ practice extends far beyond the scheduled points of prescribed risk assessment in NATO guiding documents while aligning with Aven and Thekdi (2022) definition and model for risk management.

A key finding is the interplay between formal and tacit practices. Formal mechanisms, such as risk matrices, designated working groups and dedicated risk slides during boards, provide structured opportunities to document and monitor risk. Yet tacit practices (anticipatory framing, concern-driven discussions, informal adaptations), were consistently observed to raise, contest, and mitigate risks across the HQ. This duality aligns with how the Society for Risk Analysis (Aven et al. 2018), and Aven and Thekdi (2022) define risk management as encompassing all activities to address risk, not merely formalized assessments. Informal adaptations and leadership framing, coded in 71% of CUB, 80% of COM-to-COM, and can thus be understood as legitimate, though less visible, forms of risk management consistent with contemporary theory. Whilst coordination was not observed as frequently it does not mean that it was less significant as a tacit risk management process. Not all activities could be observed and it is possible that much coordination occurred as an outcome of working groups preparing for boards (Solli 2024). Findings presented in table 3, table 4 and statements of interviewees reinforced this picture, with several officers characterizing the decision-making process as addressing risk, and emphasis made on effective mitigation requiring prioritization and trade-offs. In other words, risk management was not an isolated function but a pervasive and relational aspect of HQ decision-making.

Senior leaders' recognition that risk mitigation requires prioritization and resource trade-offs resonates directly with Society for Risk Analysis framing of risk management as inherently involving choices between costs, benefits, and tolerable risk. These tacit practices also illustrate that decision-making in NATO HQs are not only about technical assessment but about weighing stakeholder values, goals, and preferences, echoing Aven and Thekdi (2022) four-stage model of risk management. The evidence also reveals limitations in how tacit and formal practices interact. Raising risks in cross-functional forums such as the SAB did not guarantee their incorporation into formal risk registers. Despite the SAB's role as a critical arena for communication across the entire Joint Task Force. Several observed risks, even when raised in broad attendance forums, were not subsequently tracked in formal processes. This suggests that while tacit practices are vital for surfacing emerging concerns, NATO lacks reliable mechanisms to ensure continuity between informal deliberation and formal risk documentation. Potentially resulting in a working level more or less deliberate filtering of risk and risk factors.

Finally, the conception of risk among practitioners appeared broader than NATO doctrine implies. While doctrine tends to emphasize threats to operational success, interviews indicated that personnel also considered institutional, reputational, and resource-related vulnerabilities. This divergence underscores a structural gap between how risk is formally defined in doctrine and how it is understood and managed in practice. The gap between NATO doctrine and observed practice reflects a narrower doctrinal framing of risk management compared to Aven & Thekdi's (2022) holistic model. Whereas doctrine confines risk to discrete assessment points, risk science underscores that management is an ongoing process shaped by values, goals, and trade-offs. Arguably making the tacit risk management processes more explicit, and acknowledging them in formal doctrine, could reduce variance in how risk is identified and appreciated. By omitting these value-based trade-offs and tacit practices, NATO doctrines are only codifying a fraction of what contemporary risk science defines as risk management, and is generally accepted as risk management contributions by the interviewees and observed to contribute to praxis in NATO HQs.

6. Conclusion

The analysis demonstrates that NATO HQ manage risk through a dual praxis of formal procedures and tacit practices. Formal mechanisms provide necessary structure, but their scope is limited to a small set of scheduled events, while tacit practices are pervasive and constitute the primary means by which risks are surfaced, debated, and mitigated during the decision-making cycle. Evidence shows that risk considerations are embedded across almost all HQ processes with observations of explicit or implicit risk elements in virtually all of observed activities. Evidence which was reinforced by the interview data. This prevalence challenges doctrinal descriptions that treat risk management as a discrete, bounded process. These findings reaffirm Aven and Thekdi's framing of risk management as encompassing all activities to address risk.

Tacit adaptations and leadership framing are not peripheral but integral expressions of risk management in practice. They can be understood as a pervasive, protective layer within the HQ' decision-making system, much like an immune response, continuously surfacing, reframing, and mitigating vulnerabilities. Personnel themselves appear more cognizant of this embedded reality than NATO as an organization, highlighting a structural awareness gap. This disconnect opens the door for significant variation in praxis across NATO. Risk mitigation, as emphasized, is not cost-free; it requires prioritization, trade-offs, and sometimes forgoing something.

While this study is based on exercise environments, the consistency of the evidence across multiple HQ suggests that the gap between doctrine and practice is structural rather than incidental. These findings reinforce earlier research arguing that NATO would benefit from re-writing its doctrine in a way that acknowledges and utilizes tacit practices of risk management, which would also aligning it closer to contemporary risk science. At the same time, doctrinal reform should acknowledge that risk management is a continuous process shaped by values, goals, and preferences, not merely a set of formal assessment events.

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