

CANSO Europe Strategy for the Future of Safety in ATM

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Introduction

In an industry which exhibits high levels of safety, and where the consequences of failure can be truly catastrophic, it is clear that our methods of safety management must challenge any creeping complacency and remain appropriate so that they continue to inform us of our risk.

Rather than waiting for possibly catastrophic, unrepresentative and increasingly rare incidents from which to learn and mitigate, with possible knee-jerk, fire-fighting, uncoordinated, blunderbuss, 'fix everything' reactions, the CANSO Europe safety approach must evolve to become more sensitive, anticipative, intelligent and precise.

When we reflect on these thoughts we conclude that the application of the current understanding of ATM safety may be ineffectual in the future. We need to understand ATM safety in a different way and through this new understanding challenge the way that ATM has undertaken safety assurance and enacted safety interventions. The implication is that if we carry on as we have done before we will be in the unenviable situation of not knowing how safe we are.

The aim of the CANSO Europe Strategy for the Future of Safety in ATM is that it should create a mind-set change in how people working in European Air Traffic Management think about safety. We believe that in such diverse organisations, a mind-set change is the only possible method of achieving the necessary changes we set out for the future. However, the themes of the strategy will mean different things to different people and we do not expect everyone to agree with all of them. This is natural and to an extent encouraged since, in proposing the strategy, we are stating the direction. It will be for individuals to stop and think about how and what they will change to meet the themes and how they can make it a reality in their organisation.

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About this strategy paper

This strategy paper provides and introduces the four key themes which form the emerging CANSO Europe Strategy for the Future of Safety in ATM. It summarises the challenges to the way we currently think about safety and lists a number of key principles which should guide the development of the strategy and the implementation actions to bring it to life.

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A Strategy for Safety in ATM

The CANSO Europe Strategy for the Future of Safety in ATM has been developed to answer the key question: "Are we safe now?" and "Will we be safe in the future?"

We approach the answer by examining a number of facets to this question:

- How has ATM safety evolved?
- How do we currently measure how safe we are?
- How do we assure the safety of our systems, processes and procedures?
- How is safety delivered in the operation?
- Has all of this worked?
- What do we mean by safe in the future?
- How will we predict risk?
- How do we address the challenges of regulation and the pace of change?
- What is the role of the human in delivering safety and how do we protect this?
- How do we prioritise what actions we should take to ensure a safe ATM operation?

A review of the relevant safety science literature and a survey of current industry practice concludes that our current safety approach is insufficient to answer key questions about risk and aid our understanding of what safety means in the future. We need to think about safety – in all of its manifestations - in a new way. We introduce four key themes which are simple, clear, meet the challenges of the future and which should guide the development of a new safety philosophy in the ATM industry. These four themes are:

- Safety intelligence
- People create safety
- Tailored and Proportionate
- Challenging and Learning

Each of these themes is briefly explained in the following pages.



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Safety Intelligence

The traditional approach to safety monitoring and measurement that has evolved within ATM has been one which investigates and counts the number of times we fail to provide a safe service and learns the lessons of past events to eliminate a reoccurrence. This is a philosophy that seeks to learn from the past to make the future safer; but it is a philosophy rooted in the past, in hindsight and in retrospect.

Since accidents are very rare in ATM, we have used proxies for the accident and have counted and investigated losses of separation and other phenomena around determining the extent to which control over the situation has been lost.

ANSPs today define safety to be the reduced frequency of specified adverse safety related events – if there are fewer losses of separation we are therefore safer or safe enough.

When we have an adverse event our focus has been on what we did wrong, what failed or malfunctioned. We strive to learn the lessons of these events and then through incident investigation try to identify the root cause and eliminate it or improve the barriers to trap the event before it could become an incident again.

Understand why, and how, for the vast majority of the time, things go right

This has been effective in the past. As is observed in the recorded data, we are experiencing record low numbers of events. However, if we have no events it makes understanding how safe we are, in this classical philosophy, very difficult. Just because we have no losses of separation do we truly believe that there is no risk in the operation – as a naïve interpretation of our current metrics would lead us to conclude? When we do have incidents, are we learning anything new and are they exposing the true risks in our operation? Given the amount and the nature of the changes the ATM operation is about to undergo, can we really infer our future performance from the past?

Redefining safety to be what went well not just what we did wrong

Our performance and the structural changes to the ATM system are such that we must adopt new measures to not only understand how safe we are, but to also understand what safety is. We will do this by thinking about and approaching safety in a new way. We must redefine safety to be what went well, not just what we did wrong. We must change our view to recognise that safe system performance comes from the same processes which yield success and failure. We need to understand why, and how, for the vast majority of the time, things go right and do not result in incidents. We must use this understanding of normal, day-in-day-out performance to do better and so be safer.

It will still be important to learn the lessons from unexpected events, as we do today; but what we learn must be more meaningful and look at the ATM system as a whole rather than mainly focusing on the human contribution.

We will need to develop new ways of measuring our everyday performance and develop new understanding of how the ATM system produces a safe operation. We should then use this understanding to strive for consistent, robust, appropriate and repeatable levels of performance. We should set the bounds for safety performance in the operation, at the ATM system level, and dynamically control the hazards, possibly even in real-time. We will then use these measures as leading indicators of our safety

performance to anticipate risk. We need to develop a variety of possible actions to control safety that have been proven and produce predictable effects.

We also need to take this new, success-based, view of safety into the design and assurance of the systems which we use in the operation. Rather than just focusing on how they can fail, we need to ensure that we embed safety benefits in the design of new systems from the start.

What are we already doing?

- Activities like Normal Operations Safety Survey (NOSS) and Day-2-Day, which focus on identifying best practice and then trying to make this consistent across our operations

What could we do differently?

- New risk modelling informed by real-time operational data of everyday performance
- Dynamic controls of hazards
- Safety assessments which explicitly demonstrate that the right functions and performance are embedded within the design to deliver maximum safety benefits

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People Create Safety

We must guard against any creeping complacency

The safety performance of European ANSPs, as judged on past performance is perceived as being among the best in the world; but we must guard against any creeping complacency in our organisations. We must be watchful for an over reliance on past successes in our attitudes about safety in the future. We must continue to harbour a chronic sense of unease about our performance. We must be curious for the bad news as well as the good.

People deliver safety, not paper

The use of advanced automation that sees greater integration between human and technical support systems in the operation means that the non-operational functions of the organisation will have a much more significant role in the shape of safety in the future. For example, decisions made by engineering design teams will be increasingly influential in setting up the context and precursors of the incidents of the future.

Individual actions and behaviours reinforce our organisational principles and values

The Piper-Alpha, Challenger, Columbia and Nimrod investigations, among others, have highlighted the importance of the organisational culture in delivering safety.

People are our strength, not our weakness

Firstly, safety comes from individuals in the organisation taking personal responsibility and ownership for safety. However, where we may have focussed on the front-line operation, we need to embed a belief of forward-thinking accountability – making the future operation safer - into all aspects of the organisation. We need to ensure that everyone talks about and understands how their part, however minor or divorced from the operation it might appear, relates to how the company produces safety today as well as in the future. But we cannot ask people to feel responsible if they don't have the capabilities or authority to act. Therefore, we need to raise awareness formally and informally about safety and the role of the individual. We must also recognise that the individuals doing the work are the most knowledgeable about the safety risks and are in the best position to effectively control them. Many actions are undertaken without supervision so only a real commitment by everyone in the organisation can sustain a safe operation. We must strive for the view that safety is a value held by everyone and not a competing priority and that it is not service versus safety, but service with safety.

Safety is a value held by everyone

Secondly, we must recognise that individual actions and behaviours reinforce our organisational principles and values. We must be clear on the safety principles that our organisations stand for; we must act justly if these behaviours are breached and we must feel comfortable in challenging poor behaviours wherever they are in the organisation. It is only by working together that we deliver a safe service.

Our leaders and accountable managers set the tone for safety and ultimately set the culture of their organisation through their commitment. We must guard against complacency and anything which could distract us from a safe service. We need to ensure that when we set targets or objectives that they drive the right behaviour and do not create perverse incentives.

Safety is good business

Lastly, safety must not be tacked on as an after-thought or done in isolation; it must be integrated into how we do business. This means that it is fully embedded in our business processes, not hidden, but not separate. We must realise that safety is good business; not just in avoiding the accident, but that doing safety right and early-on results in better and cheaper products and services.

What are we already doing?

- Promotion of a “Just Culture” in our organisations as an enabler for safety improvements, for instance improved reporting rates

What could we do differently?

- Evolving accountabilities so that they are integrated into job descriptions with regular monitoring of progress
- Introduce qualification of competencies in safety with mentoring, coaching and, where necessary, formal assessments
- Shift the organisational culture from just the operation to safety of the whole organisation
- Safety, both good and bad news, has a high profile in corporate communications

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Tailored and Proportionate

The ATM world is undergoing a significant revolution and we observe that it is out-growing our traditional Safety Management Systems. We believe that CANSO Europe members will struggle to cope with and understand the safety implications of the increasing dependency on automation and the increased complexity of future systems. Our Safety Management Systems were not designed to cope with the increasing levels of connectivity across ATM systems where a single decision can propagate across the ATM network. They have a limited concept of sharing of responsibilities between the ground and the air or even between technical and human elements of ground-based ATM. Lastly, they are not ideally suited to the strategic partnerships and collaborative system developments which we must use to deliver the harmonised systems we need at a cost we can afford.

Precise in our approach but with the flexibility we need

Ever increasing cost pressures from our customers and regulators mean we must ensure our safety actions are appropriate. We must be intelligent and precise in our approach so that we do not waste resources on the wrong action or the wrong risk. When we do take action to change how we deliver a safe service it must be proportionate to the risk.

Proportionate to the risk

We need to evolve our Safety Management Systems so that they are adaptable, progressive and fit for the challenges of the future. The safety philosophy which we adopt must be perfect for the intended purpose – it does not require more and more assurance it requires just enough and no more. We propose that the SMS should be built around a set of fundamental principles or values which are the lines we will not cross or the rules we will not break but that it permits many different ways to provide the assurance that we need.

But tailored and proportionate goes beyond the processes which we use to manage the assurance of safety. It embodies an ethos which describes how we could, for example, use our past performance to tailor training programmes specifically to the individual. It also describes the idea that risks are best managed at the level of the organisation where they will have an effect. It is about empowering individuals to take risk mitigating actions as part of their normal day to day role. This will enable us to be more proportionate in our approach to risk.

Safety is integrated into how we do business

We must implement a more tailored approach to the integration of safety into how we undertake projects, make changes or introduce new procedures. With safety integrated into how we do business, rather than being tacked on at the end, we can take more proportionate and structured decisions in design, procurement, planning, maintenance, contracting and partnerships. Procedures which are tailored to safety have risk control mechanisms built-in to the task. The vision we have, the business strategy we adopt and the priorities we give must all be taken with safety in mind. Our attitude to the on-going rulemaking programme needs to become more proportionate to the risk which it might present so that we can target our efforts appropriately.

What are we already doing?

- SMS development programme to set out the guiding principles

What could we do differently?

- Identification of other methods of assurance which meet our needs
- Tailor system developments using predictive safety indicators
- Incorporate safety into all aspects of how we do business
- Tailor training to previous performance

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Challenging and Learning

European ANSPs increasingly operate in a wider world. We are increasingly collaborating with other organisations on, for example, systems development or sharing of airspace. We are also being subjected to changing rules from changing regulators.

We also must understand that we are, and will be even more so in future, resource constrained. Whereas in the past we may have adopted an altruistic approach to helping other organisations and, to some extent, we have taken on their risks for them, we will not be able to continue to do this. Conversely, we have also been accused, rightly or wrongly, of being introverted organisations which do not learn the lessons of the past or from others. When considering the future of safety in ATM: how do we keep helping others whilst addressing any perception of arrogance?

In future, we should respect that others will own risks that influence our operations and we must make sure that ownership of risks is clear. We should be more questioning of others and challenge the rigour and pace of risk mitigation by them. But we must also learn from and collaborate with others where a risk is truly shared so that we can ensure it is properly addressed to the benefit of aviation safety.

Welcoming and encouraging challenge from across the organisation when it makes us safer

It is also clear that we need to be at the forefront of safety management and safety innovation. This will put us in a position of strength when we are challenged by others as to the safety, cost and efficiency of our services.

With the increasing amount of international rules and regulations imposed upon us we must ensure that the metrics which are used to measure us drive the right behaviours. We need to be clear and understand that rules do not necessarily make us safer and proving it is safe does not necessarily make it safe.

This theme also takes an inward look at ANSPs. We should continue to foster a culture of challenge in our organisations to guard against complacency and to support us in striving for better, safer, more efficient levels of performance. It is also about supporting a diversity of views across the organisation so that we have broad expertise to draw upon when addressing the challenges we face.

The accumulation of knowledge and ensuring that it is available for use in safety management is vital. We need a more systemic approach to learning from previous experience (both internal and external) so we share insight, promote learning and understand how safety is produced by the ATM system.

Effective and open two-way communication connects and aligns an entire organisation to the common goals and objectives of safety management. Whilst visions, policies and strategies from management are important in setting the tone of an organisation, we also recognise the value of feedback and welcome challenge from across the organisation to the realities of the operation and use this to inform our risk management activities. Our leaders empower the right people, give them the resources they need and prioritise safety actions accordingly. ANSPs must become learning organisations which anticipate the unexpected and which constantly challenges themselves.

What are we already doing?

- CANSO ensures that ANSPs have a strong voice with our regulators
- We work with industry on safety improvements
- Continue to work for an open and sharing environment when it comes to safety

What could we do differently?

- Proposing the metrics now for future regulatory control periods
- We have a clear view of those risks and prioritise which we tackle ourselves and those which we challenge others to address

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Guiding Principles

These guiding principles and ideas point towards how we believe ATM safety should be managed in future. They need to be embedded within the ATM industry to enable the industry to achieve safe and efficient operations in the future. We do not intend for these points to be “set in stone” but rather that they set out the ideas behind the path ahead.

- 1. Safety is a value, not a competing priority** - Safety is a product of our everyday activities and our performance. It needs to be integrated into our business processes and decision making. It must not be tacked on at the end. We must evolve from the view of service versus safety to service with safety.
- 2. Failure and success come from the same source** - Our safety model should reflect progressive safety thinking and must go beyond simple cause and effect since the world is more complex than that. Our capacity to deliver a safe and efficient service depends on our ability to make performance adjustments and adapt to risks and critical situations. Incidents result from the consequences of our normal everyday actions when we cannot make these adjustments and not from failures, broken components and a predictable sequence of events. We need to adopt a resilience engineering approach which describes how we must have a capability that allows us to respond to these events, to recognise them, to act and then to learn.
- 3. Performance measures are proactive and anticipate risk** - We can no longer measure safety by simply counting incidents. We need to move from a model which relies overly on lagging indicators to a mixed model that also makes use of leading indicators and measures that help us understand how mutually dependant functions in the ATM system elements can come together to create the opportunity for performance variation. Our measures help us prepare and anticipate risks in all our operations and provide the capability for resilient operations even when the risks are unknown and never conceived or experienced before. We no longer only use the past to inform the future and neither is safety only predicated on past performance.
- 4. Cultivate a chronic sense of unease** - We must have a culture which supports questioning and which challenges complacency and the reliance on past success as a perceived guarantor of future safety. Where we continually ask: how did that happen? Not just about failures, but also about our successes. Where an understanding of normal operations is just as important to safe and efficient operation as learning from failure. All incidents are seen as opportunities to learn just as much as normal day-to-day operations. The investigation changes to be an analysis process which is open with all levels involved and learning is openly shared.
- 5. People are our strength, not our weakness** – The human in the ATM system has a key role in ensuring the safety of the operations. Human decisions can only be understood in the context in which they are taken. Human error is not a cause but a symptom. Competence in every role is essential to sustaining reliable and safe operations. We empower individuals and devolve responsibility, recognising experience and expertise. We ensure that training is relevant and provides the right knowledge and skills.
- 6. Knowing when enough is enough** - Our processes must support us in taking the right actions to address the right risks to achieve the right outcomes and tell us when to stop or give us the confidence

to change direction. We must guard against “gold-plating” and look to make our management processes goal-based and flexible without necessarily prescribing the method to achieve it.

7. Beware of perverse incentives - We should use metrics and measures carefully and ensure that they drive the right behaviours, system outcomes and performance. We need to communicate our values and goals so that when we use targets they are set at the right level in the organisation. We verify not only that the necessary activities are being executed but that the expected outcome is also being achieved.

8. Make it safe rather than prove it is safe - We embed safety-by-design principles in our project lifecycle to deliver maximum safety benefit from projects. We understand that good design delivers good safety, we use detailed risk models and quantitative requirements to the minimum extent necessary and make better use of expert judgement. We adopt a progressive approach to what delivers safety which doesn't assume, suppose or resort to safety by accountancy.

9. Do not just blindly 'do' safety – Through training, we provide the workforce with the capability to make these principles real, to progress from the service versus safety view evolving, over time, to a company ethos of service delivered safely. We extend the benefits of the human contribution to safe operations to those beyond the sharp end.

9

Tell us what you think

We are seeking your comments, insights and thoughts on this strategy. In particular we are seeking views on:

- how this strategy is understood and the language it uses;
- whether it makes you stop and think about safety in a different way;
- what do the four themes mean for you;
- how it might affect you in your area of the organisation;
- if it is challenging enough and promotes innovation;
- and whether you support its principles.

9.1

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