



Expert Insights

The International Air Transport Association

Bowties and Audits



Enablon Bowtie Suite

Summary

As a safety risk management expert in the aviation industry, we interviewed Matthew Lillywhite to understand IATA's approach to safety management systems (SMS), the importance of a strong and adaptable safety culture, and how they have integrated bowties into their audit and quality assurance approach.

This expert insight is a two-parter aimed to give you a comprehensive view of the steps needed to implement your SMS framework in an evolving environment.

About us

Bowtie Suite is the leading provider of barrier-based risk management solutions. It's an off-the-shelf, intuitive, risk management software solution that support your organization during every step of your safety journey to enable safe and efficient operations.

Expert Profile

The International Air Transport Association (IATA) is a trade association for the airline industry. It represents more than 300 airlines across the globe, which account for around 82% of global air traffic. IATA's primary focus is supporting their members. Their mission is to represent, serve and lead the airline industry. As such, they offer a wide range of products and services (including Bowtie Suite) to support airlines in various areas, from improving operational efficiency and financial performance to enhancing safety. Their products and services are designed to meet the diverse needs of their members, helping them thrive in a competitive industry. As a trade association in the Aviation industry, IATA is also liaising with a wide range of stakeholders; predominantly, the airlines but other organization and regulators, like the ICAO (International Civil Aviation Organization) as well.



An audit program to remain compliant

Staying safe is primordial in the aviation industry. Frequent audit and quality assurance are conducted to ensure airlines meet national and international regulation. However, this can feel like an overwhelming task.

When asked about this, Matthew mentioned one of IATA's core safety program: the [IATA Operational Safety Audit \(IOSA\)](#). A mandatory step for their member: "New members are required to sign up for this program for several reasons. A major driver is that many of our members engage in codesharing, and regulators require airlines to audit their codeshare partners," he explains.

"Large operations such as American Airlines, Qatar Airways, or Emirates, have multiple codeshare partners, which can result in an extensive number of audits in order to comply with regulatory requirements. Our audit program helps airlines meet these regulatory obligations by providing a streamlined process for auditing codeshare

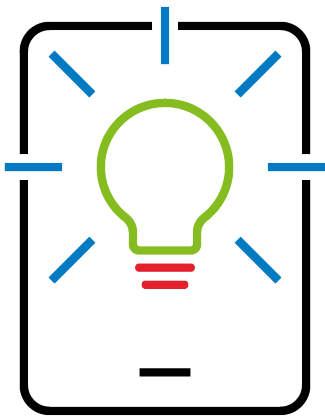
partners. This program also fosters significant interaction with regulators and other key stakeholders.

Currently, there are about 100 airlines that participate in the audit program but are not full members. In total, we have over 300 members airlines, but there are actually more than 400 airlines who are IOSA registered carriers. Recently, we transitioned to a risk-based approach for audits, which has been a significant development over the past few years. This shift reflects the broader trend in aviation audits programs, moving toward risk-based methodologies. Typically, each member undergoes an audit every two years, which renews their IOSA registration."



Matthew Lillywhite is based at IATA's Geneva office as Senior Manager, Safety Risk; responsible for leading various safety risk activities to support IATA's members and more widely IATA's audit programme - IOSA. Prior to joining IATA, he held various regulatory roles at the UK CAA - developing their SMS Strategy, leading SMS assessments, undertaking performance-based oversight of airlines, as well as involvement in risk management activities.

[View full bio →](#)



A risk-based audit approach

IATA recently moved to a risk-based auditing approach where bowties play a central role in the approach. According to Matthew, “It’s actually a huge step forward, as you can imagine.

The risk-based approach covers several aspects. One key part is assessing during the audit how an organization identifies and manages safety risks. We likely have a perspective on the risks they might be exposed to, and they’ll have their own view as well. This becomes part of the risk-based audit process.

For example, We have several key safety priorities, which we agree upon in collaboration with the industry and our member airlines, validated by our safety group. Some of the big issues right now include topics such as GNSS interference (or GPS interference), which is a major concern for operators worldwide, runway safety, and supply chain shortages affecting the available components.”

Another significant change mentioned by Matthew is how they approach standards and recommended practices that airlines

must implement: “We have a standards manual (the IOSA Standard Manual), based on ICAO standards, with about 900 provisions. Under the risk-based approach, we prioritize the more safety-critical standards, meaning auditors will focus more on those compared to standards deemed less critical.”

“The third major element”, continue Matthew, “is the introduction of a maturity assessment. This is an enhanced way for us to assess the effectiveness of an airline’s Safety Management System (SMS). It’s a great way for airlines to get a “temperature check” on where they stand, while also identifying potential areas for continuous improvement.

So, to sum up the risk-based approach, I’d say it has three main components: assessing how risks are managed, prioritizing safety-critical standards, and the introduction of the maturity assessment.”

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Senior Manager Safety Risk
IATA

Bowties, audits and quality assurance: A cohesive partnership

Matthew breaks it down “We apply the bowtie approach in several ways within IATA. The first is supporting the understanding of a safety issue. For example, we recently created [bowties for runway incursions](#) and [for loss of controls](#), incorporated them into a safety risk assessment, and published it to the industry. This helps organizations create their own risk assessments and gain a better understanding of runway safety as a topic.”

“The second application is part of IOSA, the IATA’s audit program. On the audit front, if we continue with the runway incursions as an example, the risk controls we identify often tie into activities reflected in our standards or recommended practices within the audit program.

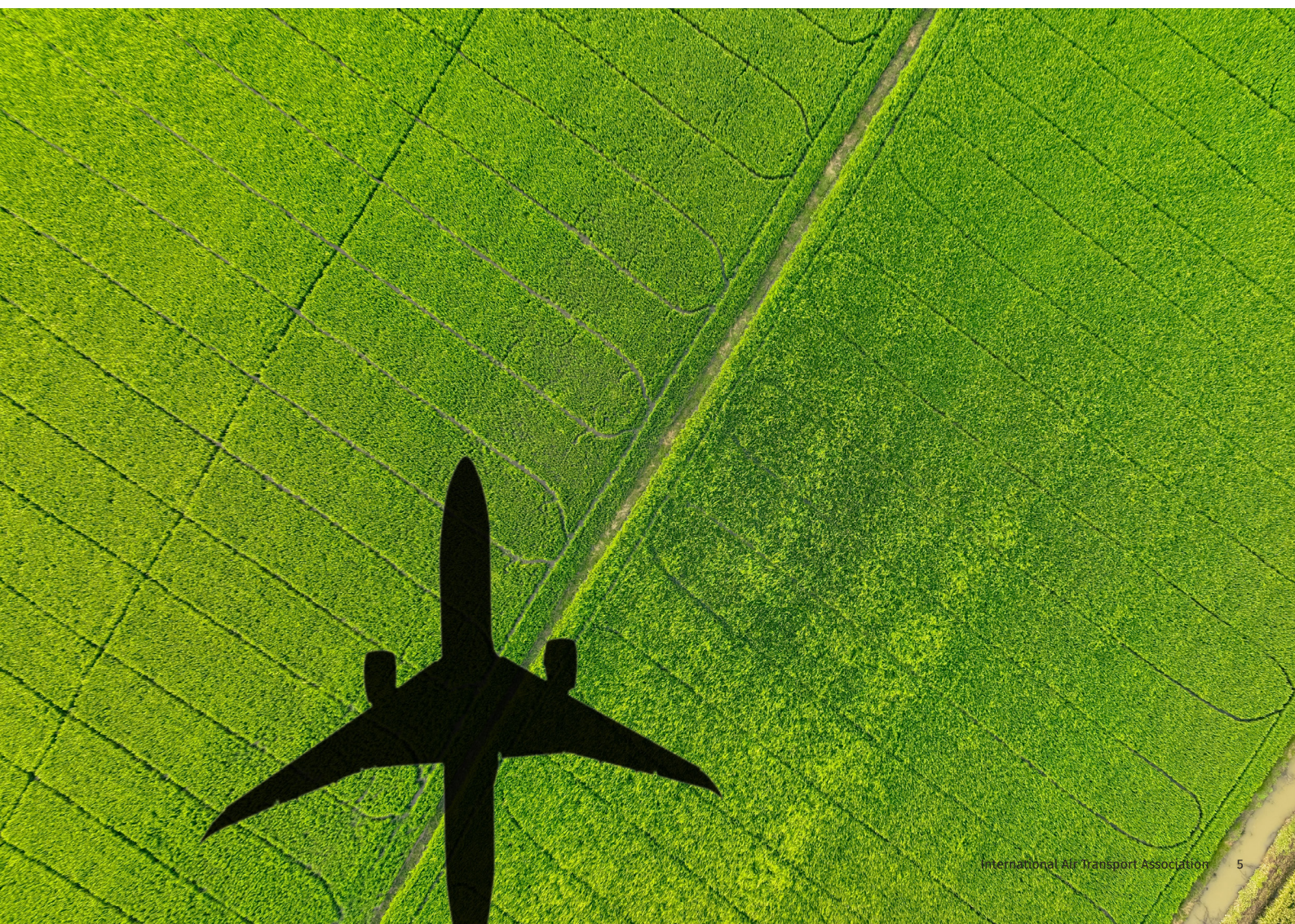
What’s powerful about this is that we can draw clear links between risk controls and these standards, which benefits us in two ways:

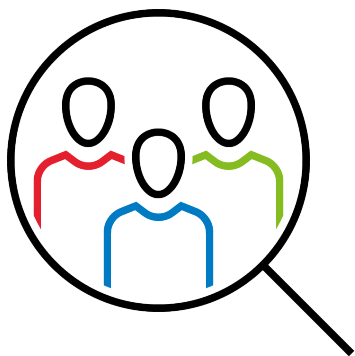
- First, it helps organizations by showing them the connection between their own audits and the relevant standards, possibly allowing them to focus their audit activities around those areas, which might impact the effectiveness of their risk controls.
- Second, for our risk-based approach to IOSA, we feed these linked standards from the bowtie’s risk controls into our audit program.

For example, if we identify certain mitigations (like mitigation 1, 2, and 3) as being linked to specific standards (such as standards X, Y, and Z), we prioritize those standards in our audit tool. This means auditors will spend more time reviewing those high-priority standards when they’re on-site at an organization. This process connects identifying safety issues, understanding mitigations, and linking them back to standards and recommended practices, feeding directly into the audit program.”

An additional way, IATA have been utilizing bowtie internally is by supporting the quality assurance of the IOSA program. “This internal audit program provides an independent check on the IOSA program itself”, Matthew expands. “This ensures the IOSA program is operating as it should, in line with its rules, procedures, and guidance. We’ve created bowties that consider all the factors influencing the program, so we can be confident it’s delivering on its objectives.

So essentially, we’re using bowtie in two ways during the audit process: one for auditing the airlines (IOSA), and another to audit ourselves (internal QA program), which in a sense, audits the auditors.”





Bowties review: An ongoing process

“It’s important to review your Bowtie or risk management processes regularly. It depends on the organization’s needs, but a periodic review ensures that the risk approach remains effective and up-to-date.”

Matthew Lillywhite
Senior Manager Safety Risk
IATA

“I’ve been fortunate to work with Bowtie methodology for a long time, and I’ve noticed that people tend to have polar opposite first reactions to the bowtie—they either love it or they don’t. It’s a bit like Marmite in the UK; it sparks strong opinions either way.

In the SMS training I’ve delivered, I often make it my mission to win over those who aren’t big fans. Reactions can be mixed at first, but when I show them a great example and explain [what Bowtie can really achieve](#), they usually come around and see its value. Where some people may not fully capitalize on the Bowtie approach is when they make it overly complicated. It ends up becoming just a poster on the wall—something that blends into the background and never gets updated.

Internally and from our members, we’ve received excellent feedback and have been able to create truly powerful safety risk assessments. These not only help us identify areas where we need to focus and prioritize our safety improvements, but they also greatly benefit our members by supporting their own risk assessments and SMS efforts. It also really helps our risk-based audit program.

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However, the review process really depends on the organization and the prioritization of risks and safety issues within their SMS. When it comes to how frequently to assess an individual risk or safety issue, I would suggest linking the frequency of review to the priority or risk score assigned to each issue. For higher-priority or higher-risk issues, you’ll definitely want to revisit them more frequently.

While it’s difficult to provide specific numbers, one approach could be to formally review high-priority risks every quarter. That said, reviews can be conducted at any time if necessary—if something changes, you should be able to reassess as needed. So, you might have a plan to review every three to six months as a minimum, but with the flexibility to take a closer look whenever a new factor emerges.

The frequency of reviews could also depend on factors such as the organization’s size, resources, and the nature of its processes. It’s all about continuous improvement and evolution, so the timing may vary. Ultimately, there isn’t a one-size-fits-all answer, as it’s highly dependent on the specific organization, industry, and region. That’s why having personalized, one-on-one conversations is so important—there are so many factors to consider that a general approach just doesn’t work for everyone. So, to answer your question, it really depends on several variables.”





Measurable benefits of using BowTie Suite

“For our members, this process is incredibly valuable because it allows them to take a generic risk assessment and customize it to fit their specific operations. This is particularly helpful for organizations that may not yet be fully mature in their risk management practices.”

“Internally, it enables us to identify key risk mitigations, which helps us focus on areas where safety improvements are needed. It also highlights safety-critical standards and recommended practices that we can feed back into our audit program. From a monitoring perspective, it’s beneficial for both internal and external users. For our member airlines, the approach offers guidance by generating helpful pointers on what to measure. Bowties can suggest potential safety performance indicators (SPIs), whether they’re measuring the top event, the threats, or the effectiveness of risk controls.

These SPIs can even be leading indicators in some cases.”

“Externally, it provides a clear overview and a map of possible mitigations, allowing organizations to compare these mitigations with what they have implemented in their own SMS. They can conduct a gap analysis, identifying missing mitigations or areas that need improvement. This visual presentation of information is especially powerful. I think that’s what is great: you can visually present that information to clearly indicate the risk controls in place.”

“Additionally, you can tag risk controls, making it clear whether a mitigation is process-related, engineering-related, or managed by a third party. It gives a quick snapshot of who owns a specific mitigation and helps determine if additional actions are needed to strengthen a mitigation”.

“Overall, It’s a fantastic tool for explaining complex issues in a clear and visual way. That said, as mentioned earlier: it’s essential to revisit and review the Bowtie regularly, as things are constantly changing. New technology, regulations, processes, and risk mitigations are always emerging. The effectiveness of existing mitigations may shift, or new threats could arise, so the Bowtie needs to evolve accordingly. Risk management isn’t a one-time activity; it’s ongoing. You’re never truly finished—it’s a dynamic, cyclical process.”

Want to learn more about bowties?

[Get in touch](#)



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