



WORKING PAPER

FOURTEENTH AIR NAVIGATION CONFERENCE

Montréal, Canada, 26 August to 6 September 2024

**Agenda Item 1: Update on the ICAO 2023-2025 Business Plan and long-term strategic planning
1.1: Reprioritization of the ICAO 2023-2025 Business Plan**

**EVOLUTION OF AUDIT METHODOLOGIES
IN RESPONSE TO NEW AVIATION TECHNOLOGIES**

(Presented by New Zealand and co-sponsored by
Australia, Canada and the United Kingdom)

EXECUTIVE SUMMARY

This paper discusses the need for Universal Safety Oversight Audit Programme (USOAP) audit methodologies to respond to new and emerging aviation technologies and regulatory approaches. The rapid pace of technological change is driving the increasing use of flexible and performance-based regulatory frameworks by States. These frameworks may differ from prescriptive mechanisms found in some Standards and Recommended Practices (SARPs) while still achieving strong safety outcomes.

In order to enable States to employ innovative regulatory solutions to the challenges posed by new technology, the USOAP audit methodologies should be reviewed with the objective of allowing for the assessment of outcome-focussed performance-based regulatory approaches. This would allow appropriate recognition of alternative means that a State might employ to achieve the safety outcomes sought, other than directly implementing prescriptive SARPs.

One mechanism for achieving this would be to adapt the methodology of the State Safety Programme Implementation Assessment (SSPIA). The SSPIA seeks to understand the structure of a State's aviation safety oversight system before evaluating its performance through evidence of the implementation and maintenance of its State safety programme (SSP). Incorporating such an approach into USOAP audits, complementing traditional audit methodologies, would provide sufficient flexibility to assess the compliance of both an outcomes-based and a prescription-based regulatory environment.

Action: The Conference is invited to:

- a) request that ICAO considers how an outcomes-based assessment approach can be incorporated into the USOAP, centred around the potential adaptation of a SSPIA-style assessment methodology as the basis for safety compliance auditing; and,
- b) recommend that outcomes-based assessment protocols and performance characteristics be considered by ICAO Panels for inclusion in SARPs as they are being developed, to support States in the implementation of those SARPs.

1. INTRODUCTION

1.1 While traditional prescriptive regulatory frameworks play an important role in aviation safety around the world, an increasing number of States have found that rapid operational changes in the aviation industry can be better achieved and implemented through performance-based regulatory frameworks. This is most apparent with respect to new entrants, new technologies and sustainability initiatives where the timeliness and resource constraints associated with updating prescriptive regulations can hamper innovation across all parts of the aviation system.

1.2 Considerable benefits to States and industry can be realised by using performance-based regulatory frameworks to enable innovation while maintaining high levels of safety. Performance-based regulation can be defined as regulation that specifies required outputs or outcomes, rather than inputs or activities, with flexibility for the regulated entity to determine how they will implement measures to comply. New Zealand has previously advocated for the increased use of performance-based regulation in SARPs for new and emerging aviation technologies ([A41-WP/107](#)), and a number of States are also adopting this approach in their national regulations.

1.3 ICAO SARPs are, in many cases, prescriptive in nature. This provides for a clear and certain compliance pathway for States, as SARPs include a structured set of requirements that can be readily transposed into national legislation. Such an approach forms a strong basis for international harmonisation.

1.4 However, in some areas, the safety outcomes SARPs are seeking to achieve could be addressed just as effectively by an alternative regulatory approach. Some States employ performance-based regulations in this manner, as appropriate for their individual operational environments. With respect to international harmonisation, this requires considering both the implementation of common technical requirements and meeting a common set of outcomes.

1.5 The USOAP audit and compliance methodologies have traditionally tended to follow a narrow path that reflects the prescription present in many SARPs. This approach works well to assess the presence of prescriptive aviation safety oversight systems. However, it is less effective as a means of assessing performance-based regulatory systems that focus on outcomes.

1.6 If a State is achieving desired safety outcomes, but is doing so using regulations and processes that deviate from those traditionally expected by prescriptive SARPs and associated ICAO guidance materials, those positive outcomes will not be appropriately reflected in audit results. This situation has the potential to undermine the overall credibility of the USOAP as a true measure of a State's performance.

2. DISCUSSION

2.1 In order to provide effective and meaningful assessments of States, and especially those that make use of performance-based regulatory systems for both new and existing aviation practices and technologies, there is a need for the USOAP to evolve to adopt more outcome-focussed audit methodologies in determining compliance with the Annexes and their respective SARPs.

2.2 Assessing a State's safety performance outcomes requires a different audit approach to the one used to assess a State's adherence to prescriptive SARPs. An outcome-based approach would seek to understand how a State has structured and implemented its arrangements to meet the intent of the SARP, before examining the performance evidence of whether these arrangements are delivering the expected outcome. This approach can still cater for the differing needs of individual States, while accommodating performance-based parts of their regulatory systems.

2.3 USOAP audit and compliance methodologies should be structured in a way that allows a mixture of outcomes-based and prescriptive-based mechanisms to be employed as appropriate for the State's regulatory environment.

2.4 The "Category B" difference type already provides a mechanism for States to notify an alternate means of compliance with Annex provisions, along with justification. The use of Category B differences should be acknowledged and accepted during the assessment of Protocol Questions related to implementation of Annex provisions and associated practices, where evidence can substantiate the State's compliance by an alternate means.

2.5 To support the use of Category B differences as an acceptable compliance pathway, there is a need to develop appropriate assessment protocols and performance characteristics to measure and demonstrate the effectiveness of a State's alternative means of compliance. The performance outcomes should be contained within the SARPs themselves to provide a clear and consistent benchmark against which a State can adequately demonstrate the implementation of SARPs in terms of the outcomes sought.

2.6 The SSPIA provides an example for an outcomes-focused safety evaluation. If a State has an effective SSP implemented to oversee the management of aviation safety, it will feature particular characteristics which can be used as a means of determining whether safety outcomes are being met.

2.7 Although ICAO is currently working to integrate the SSPIA into the USOAP, it is not yet clear what the result of that will be, or whether consideration is being given to the more fundamental question of whether a SSPIA-style approach could be applied as a direct alternative to prescriptive elements of the existing USOAP Protocol Question base.

2.8 There would be significant value in considering the extent to which the SSPIA's methodology could complement the existing prescriptive-based USOAP audit methodology, with existing prescriptive-based audit methodologies used where safety outcomes cannot be adequately assessed using an outcomes-based assessment methodology.

2.9 The primary benefit of this approach would be in providing a natural framework for assessing States in a way that considers their level of implementation with respect to safety management. It would provide ICAO with the capability to apply an audit approach that is appropriately matched for the State's regulatory environment resulting in a more accurate assessment of safety performance.

2.10 An additional benefit of this approach would be to enable the focus of any prescriptive-based audit component to be better targeted to the highest risk areas. If a State has a high level of safety implementation in a certain area, and is delivering strong performance and outcomes, there would be benefit in focusing less on these areas and more on those where implementation less evident.

3. CONCLUSION

3.1 Through careful and considered evolution of the USOAP methodologies, there is an opportunity to enhance the efficiency and effectiveness of ICAO audits. New practices should enable an audit to be structured to accommodate and respond to different regulatory environments and aviation safety oversight systems of each State, and in doing so being capable of recognising alternative means of meeting the outcomes sought by SARPs.

3.2 To achieve this, assessment methodologies similar to or adapted from the SSPIA should form the basis for compliance evaluation, which can then take into account both performance- and

prescriptive-based approaches depending on a State's capabilities, risk appetite, operating environment and resource levels.

3.3 The development of new and amended SARPs, as well as guidance material, should include outcomes-based assessment protocols that clearly define how States can demonstrate a level of equivalent safety performance to that sought by Annexes. This will enable States to choose the regulatory approach that best works for them to address the safety risks related to new entrants, new technologies and new sustainability initiatives and ensure ICAO can more effectively assess whether States are meeting the desired level of safety performance and outcomes.

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