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AVIATION SECURITY PANEL (AVSECP)

THIRTY-SIXTH MEETING

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Agenda Item 3: Policy, regulatory and oversight issues

DEVELOPMENTS IN LAGs SCREENING TECHNOLOGY AND POLICY

(Presented by the Members nominated by the United Kingdom and the United States)

INFORMATION PAPER

SUMMARY	
The purpose of this paper is to share recent developments in liquids, aerosols, and gels (LAGs) screening technologies and policies with Members and Observers of the Aviation Security Panel (AVSEC Panel) to support increased information sharing and coordination of global aviation security measures.	
Link to GASeP Global Priority	Global Priority 1: Enhance risk awareness and response Global Priority 4: Improve technological resources and foster innovation

1. INTRODUCTION

1.1 The current global LAGs security control framework was developed as a result of the successfully disrupted liquid explosive plot of 2006. Robust security controls and policies are intended to mitigate the threat of liquid explosives to civil aviation, in the context of legacy detection capabilities that were neither effective nor efficient.

1.2 Recalling the outcomes of the 35th Meeting of the Aviation Security Panel (AVSECP/35), it was affirmed that the use of advanced screening technologies represents a significant development in the future application of security controls to LAGs. These developments notwithstanding, the Panel emphasized that the implementation of new security measures and any transition in LAGs restrictions necessitate substantial engagement and coordination between States and industry stakeholders, with the aim of mitigating potential impact and confusion for the traveling public.[1]

1.3 As was assigned to its work programme during AVSECP/35, the Working Group on Threat and Risk (WGTR) undertook a review of the threats and risk of LAGs to aviation security. Accordingly, the WGTR developed a supplemental *Liquids, Aerosols, and Gels (LAGs) Global Risk Considerations* document which was disseminated to Panel Members and observers to assist the Panel in its continued deliberations and support ICAO in its efforts to address these concerns. The WGTR assessed LAGs threat

[1] ICAO, *Report of the 35th Meeting of the Aviation Security Panel, 22-26 April 2024*, para.4.2.3.1 (published on 3 May 2024).

scenarios for passengers and non-passengers, including possible attack vectors and available mitigation measures, and concluded that the overall Residual Risk of the Person-borne Improvised Explosive Devices (PBIEDs) threat type, which includes consideration of LAGs scenarios, is at MEDIUM-HIGH.[2] That said, the global implementation of security controls for LAGs, in accordance with current ICAO guidance, remains essential at this time.

2. LAGs SCREENING TECHNOLOGIES

2.1 Screening technologies employed for LAGs security controls have undergone significant advancement in recent years. Among these are Explosive Detection Systems (EDS), Explosive Detection Systems for Cabin Baggage (EDSCB), Bottled Liquids Scanner (BLS) or Liquid Explosive Detection Systems (LEDS), and Advanced Imaging Technology (AIT) or Security Scanners (SSc). Although not all of these technologies are currently widespread in their global deployment, they may allow for the future adjustment of LAGs security controls.

2.2 EDSCB technologies automate the detection of explosives and other prohibited or dangerous items, and where CT technology is used, it can provide three-dimensional x-ray images of cabin baggage and accessible property. Significant security benefits may be derived from EDSCB technologies, namely improved detection capabilities, reduced false alarm rates, and the scalability to implement software upgrades in the future. Some EDSCB technologies should demonstrate the ability to effectively detect larger volumes of liquid threats, with operationally feasible false alarm rates, which would enable the safe and secure carriage of larger liquids volumes through security screening checkpoints and onboard the aircraft. Operational efficiencies and an improved passenger experience are important follow-on benefits from the security effectiveness of EDSCB deployment.

2.3 BLS and LEDS technologies offer screening solutions for dietary and medical LAGs that are over the 100 mL allowances, LAGs in Security Tamper-Evident Bags (STEBs), and, importantly, for alarm resolution resulting from primary screening. There are number of alternative BLS and LEDS screening solutions – such as Raman spectroscopy, spatial offset Raman spectroscopy (SORS), small footprint computed tomography, dielectric measurement technology, etc. – that can analyse and identify chemical compositions, differentiating liquid explosives from benign liquids.

3. COOPERATION AND COLLABORATION TO ENHANCE LAGs DETECTION STANDARDS, TESTING, AND CERTIFICATION

3.1 Over the last several months, States, alongside key international partners (including industry), have intensified robust collaboration efforts already underway to address how advanced screening technologies may impact LAGs security controls. The Technology Alignment Group (TAG) (an informal group comprised of Germany, the Netherlands, the United Kingdom (UK), and the United States (U.S.), with France and Spain joining as of January 2025), the European Commission, and the European Civil Aviation Conference in particular, have been working to enhance coordination on LAGs detection standards, testing, and certification, with the eventual aim to relax these long-standing policy restrictions.

3.2 In the short term, these efforts are focused on joint testing of European EDSCB C3 enhanced LAGs screening solutions, work to develop a robust common testing methodology, and

[2] Per the WGTR, Residual Risk rating is derived from the quantitative scores for Likelihood, Consequence, and Vulnerability (which takes into account current ICAO mitigations) and involves qualitative assessment and consensual analysis by the WGTR members.

engagement with industry, including Original Equipment Manufacturers (OEMs), on the development and/or revision of LAGs detection algorithms. The long term is focused on testing against a defined TAG EDSCB detection requirement that will address both U.S. and European prioritized requirements for both bulk and liquid threats.

3.3 Results of testing carried out last year indicated that the EDSCB LAGs algorithms in use at that time did not display the expected response when challenged with higher volume liquids, thus potentially allowing for additional risk to be introduced into the global aviation system should restrictions on LAGs volumes be relaxed. This resulted in the UK and the European Commission taking decisions to restrict individual container volumes back to a 100 mL maximum in order to mitigate the additional risk.

3.4 Beyond the coordinated work on developing a common testing methodology and joint testing, work has also been undertaken to engage with the OEMs on these issues, especially to refine detection algorithms, with the goal to reassess EDSCB with revised algorithms to ensure effective detection of higher volume liquids, with some promising outcomes anticipated. An additional area of work is to fully understand the capability of current resolution technology such as BLS and LEDS, in particular for container types, such as opaque containers and/or containers made of particular materials. Development of this technology is also being prioritized by the TAG, its international partners, and industry.

4. NEXT STEPS AND PATH FORWARD

4.1 Innovation is a key driver for the evolution of aviation security screening. Over the coming months and years, when algorithms have been proven to detect liquid explosives effectively and consistently, States may take divergent paths on LAGs security controls based on the technological solutions they successfully deploy. When doing so, we may expect that some States will choose to relax LAGs security controls in the near term to maximize the use of these next generation screening technologies. This is likely to lead to inconsistencies in the treatment of LAGs across the global system as procurement and deployment of these advanced technologies will not be available to all stakeholders at the same time, if at all.

4.2 A State’s decision to adjust LAGs security controls must be informed by a thorough assessment of the LAGs threat and risk posed by any change to existing mitigation measures, proven testing results of LAGs software and algorithm detection capabilities, with due consideration paid to variables including types of liquids, volume, container type, and quantity of containers, as well as a consideration of operational impacts. Moreover, future policy changes to LAGs security controls should be deliberate, phased, and well-communicated to passengers and to other States, to minimize negative impacts to aviation security or operations.

4.3 In summary, States should continue to coordinate closely with international partners, industry stakeholders, and ICAO as further testing of advanced screening technologies is completed, and new policy changes can be realized in a coherent manner that is supported by relevant test data.

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