International Civil Aviation Organization

WORKING PAPER

HIGH-LEVEL CONFERENCE ON AVIATION SECURITY (HLCAS)

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Agenda Item 8: Driving technology developments and innovation

NEXT GENERATION SCREENING

(Presented by Canada, the Netherlands, the United Kingdom, Airports Council International (ACI), the International Coordinating Council of Aerospace Industries Associations (ICCAIA) and the International Air Transport Association (IATA))

SUMMARY

This paper proposes a high level component research roadmap to stakeholders wishing to develop a next generation passenger screening checkpoint. The roadmap describes a range of options that can be considered by States and adapted to their specific needs and abilities. The roadmap is based on the advances being made by public and private stakeholders participating in the development of next generation screening initiatives. This framework is being offered as the foundation for future guidance material and training offered by Member States. Recognition of these advances will assist and accelerate future component development and implementation.

Action by the HLCAS is included in paragraph 4.

1.   **INTRODUCTION**

1.1   Civil aviation will continue to be challenged by the need to evolve passenger screening practices to counter emerging security threats while managing operational efficiencies, especially in the face of projected traffic growth.

1.2   The aviation security community is increasingly aligned on flexible, outcome-focused, risk-based solutions. This applies at all levels of the aviation security system including, at its most visible and emblematic layer, the passenger screening checkpoint.

2.   **INDUSTRY ADVANCES**

2.1   At the 37th ICAO Assembly, IATA invited the Assembly to support the deployment of a next-generation security checkpoint, developed jointly by government and industry, that would integrate screening technology with intelligence, behavioral analysis and passenger data[1]. The Assembly agreed that industry and government roles in aviation security be aligned, and that a "checkpoint of the future" be developed.

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[1] A37-WP/252, Strengthening Global Aviation Security by Leveraging Industry Operational Capabilities and Technical Expertise

2.2   Consistent with direction given at subsequent meetings of the ICAO Aviation Security Panel, stakeholders from across government and industry have worked on defining the evolution of passenger security screening. The ICAO Secretariat, the Chairman of the ICAO Technical Advisory Group on Next Generation Screening (TAG NGen), States, airports, airlines, manufacturers, research facilities, and others participated in a variety of expert working groups in different regions and formats. These groups continue to work to define the current and envisioned end-state, validate evolution capabilities, and set possible timelines for deployment.

2.3   This collective effort has resulted in a proposed roadmap that identifies components that could contribute to the evolution of passenger screening processes and technologies over the next decade, from near term (2014), mid-term (2017) to possible end-state (2020+) capabilities. The proposed roadmap is flexible with components that can be implemented in varying degrees, commensurate with the needs, legal requirements and abilities of the State. The stakeholders also recognize that availability and affordability of technologies will influence timelines and implementation. The proposed roadmap is included as an Appendix to this paper and further input from States is encouraged through the ICAO TAG NGen with the support of industry groups. Similarly, these stakeholders are working to validate the concepts and near term attributes of the proposed roadmap. Key components will be tested in multiple operational environments over the next year.

2.4   Continued refinement of the proposed roadmap and results of the operational trials will serve to define the activities in 2013 and beyond.

3.   **STATE ADVANCES**

3.1   A number of States, including Canada, the United States and the Netherlands, have introduced or are considering initiatives that employ risk-based screening of passengers. These forward-looking initiatives are of great value and other States are encouraged to undertake similar trials.

3.2   However, regulatory frameworks in many States do not currently support such an approach. In order to move the next generation of passenger screening forward, States need to focus on regulating security outcomes rather than adopting prescriptive and redundant processes. This approach needs to be shared among security stakeholders within the State.

3.3   States are encouraged to provide information on their efforts to advance aviation security practices through ICAO's TAG NGen, and to develop a collaborative mechanism to collect and share information that will allow: timely development of guidance materials; contribute to a comprehensive future global security plan; and establish best practices.

3.4   Efforts to implement next generation screening must be undertaken within a framework of broad mutual recognition so that additional security measures are no longer required at departure gates or transit/transfer ports.

4.   **CONCLUSION**

4.1   The High Level Conference on Aviation Security is invited to conclude that the industry, in conjunction with States and other stakeholders, has made significant progress in developing a framework for the next generation of checkpoints and passenger screening.

4.2   The HLCAS is invited to recommend that:

a)   States recognize the importance of modernizing regulatory frameworks to support the introduction of regulation based on risk and security outcomes;

b)   States review and endorse in principle the proposed roadmap, and agree that it should be further developed through the ICAO TAG NGen with the support of industry groups;

c)   ICAO supports the TAG NGen as an important forum for sharing information and best practice between States and industry stakeholders and for coordinating the development of guidance materials to support the implementation of next generation security components; and

d)   States and industry share information related to evolving passenger screening processes and technologies.

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APPENDIX

HIGH LEVEL COMPONENT RESEARCH ROADMAP

The following information describes components and their availability as passenger screening processes and technologies could evolve in the short (2014), medium (2017), and long term (2020+).

Components

Passenger Data

Passenger data, including Passenger Name Record (PNR), Advanced Passenger Information (API) and check-in information are existing data sources that could potentially be used to provide a risk assessment of passengers prior to their entry to the security checkpoint: a full range of data sources will need to be considered. The level of assessment may vary. Risk assessment may be conducted by the government agency responsible, the airline, or a combination of the two; with a shared goal of integrating information into the passenger screening process to mitigate privacy concerns and legal restrictions.

Known Traveler

Additional risk assessment could be conducted as part of a pre-screening program. This could allow government agencies to perform detailed background checks for a subset of travelers who voluntarily enrol in a program. In addition, consideration may be given to individuals with pre-existing national security clearances, those in armed forces, or other similar special circumstances; in these instances, States may elect to provide "automatic" enrolment in known traveler programs. In the long term, an interoperable, globally accepted known traveler program could be developed.

Identity Management

Identity management could enable automation and process improvement; and could also provide a mechanism for cross-referencing a passenger's identity to their risk assessment at the checkpoint. Biometric collection and verification is envisioned, coupled with passenger data and risk assessment, to ensure the passenger's identity is verified, their passage through security validated, and the appropriate level of screening applied.

Behavior Analysis

Behavior analysis is considered an additional component of risk assessment that could be combined with other elements or used alone. The application may range from individual questioning to a broader observation as the passenger moves through the airport. The results from the analysis can be combined with other assessments to determine the level of screening to be applied.

Alternative Measures

Random selection, remote screening prior to arrival at the checkpoint, and use of explosive detection dogs, all provide additional or alternative measures to the risk assessment components described above.

Enhanced Detection Capability

As technology evolves, there may be opportunities to improve processes and allow passengers to divest less at the checkpoint. The roadmap suggests a gradual evolution towards the long term goal of walk-

through screening, leaving personal electronics and liquids in bags, and removing the need for passengers to remove coats and shoes. Not all measures would apply to all levels of screening.

Passenger Experience

Queue times and throughput could be improved, even in the short term, through the implementation of best practice checkpoint measurement and management systems. In the medium term, video analysis of checkpoint performance could assist in automating management of the checkpoint, providing feedback on peaks, staffing requirements and process efficiency.

Access and Egress

In the short term, there are already a number of best practice recommendations that could be implemented to improve access and egress, including configuration of divesting tables, tray management staff training and information for passengers.

Staff Planning and Allocation

Process improvements and automation that provide more effective measurement and planning could be implemented to better manage staff deployment at the checkpoint.

Non Sequential Processing

Separating the link between physical passenger screening and bag screening (but retaining a complete picture of the traveler for the screener) could provide significant process time improvements in the medium term. In the long term, walk through screening may provide an alternative to non-sequential processing.

Remote Image Processing

Screening of images at a central point rather than at each lane could maximise both technical assets and staff utilization.

Lane Design

Improved equipment and process automation could maximize throughput in the short term, with the implementation of flexible lanes, able to adjust screening sensitivity depending on risk assessment, envisaged for 2020.

Proposed Roadmap

Components could be implemented depending on the needs, legal requirements, and abilities of the State, the airport environment in which the checkpoint operates, and availability/capability and affordability of technologies.

Component/Option	Short Term (2014)	Medium Term (2017)	Long Term (2020+)
Passenger Data	Basic risk assessment		
		Risk assessment based on wider range of data, national targeting centres	
			Global, national, international agencies, multi-lateral agreements, data sharing, interoperability
Known Traveler	Risk assessment through national and bilateral known traveler programs		
		Expanded bilateral agreement of known traveler programs with mutual recognition of risk assessment	
			International, interoperable known traveler with mutual recognition of risk assessment
Identity Management	Biometrics data capture, automated document authentication		
		Identity confirmation at checkpoint, link to screening decision	
			Use of e-passports for identity authentication
Behavior Analysis	Direct questioning		
	Behavioral observation (by specialists)	Automatic behavior detection	Behavioral characteristic observation (whole of airport)
		Automated integration with risk assessment	
Alternative Measures	Explosive Detection Dogs		
	Random selection for high risk screening		
		Document Trace Detection	Stand-off screening using remote screening technologies
Enhanced Detection Capability		Screen liquids without divesting	
		Screen tablets and e-Books without divesting	Screen all personal electronics without divesting

Component/Option	Short Term (2014)	Medium Term (2017)	Long Term (2020+)
	Automated detection of weapons	Increased automated detection of explosives	Enhanced automated detection of explosives
		Leave coats and jackets on with metal divested	Leave coats and jackets on without divesting metals
		Dynamic adjustment of equipment sensitivity (flexible lanes)	
	Process improvement for belts and shoes	Dynamic and risk based deployment of detection algorithms (explosives, liquids, guns, knives, etc.)	
Passenger Experience	Checkpoint measurement and management system		
		Video approaches to record, measure and assess checkpoint performance	
	Interface standards and approaches for connection of security equipment		
Access and Egress	Optimized queue structures for efficient lane utilization and throughput		
	Improved understanding of security rules and procedures to minimize delays due to non-compliance		Simplified rules through automation and improved process
Staff Planning and Allocation		Officer allocation best practice (e.g. teams, flexible resource) to reduce passenger waiting and lane down time	Forecasting best practices to improve capacity and demand matching
Non Sequential Processing		Separating the link between the passenger and bag screening process to reduce dependencies and optimize throughput	
Remote Image Processing	Maximize asset and officer utilization		
Lane Design	Improved equipment and process automation to maximize throughput	Flexible lane design for optimum operational efficiency	

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