The Fourth Meeting of the Aerodromes Operations and Planning Sub-Group (AOP/SG/4)

Video Teleconference, 10 to 13 November 2020

Agenda Item 4: Provision of AOP in the Asia/Pacific Region

NEW TECHNOLOGIES AT HONG KONG INTERNATIONAL AIRPORT

(Presented by Hong Kong, China)

SUMMARY

In view of the coronavirus disease (COVID-19) outbreak in 2020, this paper sheds light on various innovative technologies adopted by the Hong Kong International Airport in protecting airport users from COVID-19 infection. On the other hand, as the airport takes forward the Three-Runway System project, new technology is also being developed jointly by Hong Kong Civil Aviation Department and Airport Authority Hong Kong in further enhancing the airport operational safety and efficiency, details of which will also be shared in the paper.

1. INTRODUCTION

1.1 In addition to ensuring that the safety of passengers and airport staff is always the first priority of Hong Kong International Airport (HKIA), the focus this year at the HKIA has been targeted at various hygiene measures introduced to address the impact of the coronavirus disease (COVID-19) which poses an unprecedented challenge to the global aviation industry. As the primary entry point into the city, HKIA has spared no efforts in ensuring that stringent hygiene measures are in place to protect all airport users from COVID-19 infection.

1.2 This paper highlights various advanced technologies applied at the HKIA in protecting airport users from COVID-19 infection. Meanwhile, momentum has not been derailed in preparing the airport for the future Three-Runway System operations. This paper also shares the new technology under joint development by Hong Kong Civil Aviation Department (CAD) and Airport Authority Hong Kong (AA) in enhancing the airport operational safety and efficiency.

2. DISCUSSION

Part 1: Protecting Airport Users from COVID-19 Infection

<u>"CLeanTech" Disinfection Channel (Figure 1)</u>

2.1 HKIA is the first airport worldwide to trial "CLeanTech", a full-body three-in-one disinfection channel facility, in live operation. The interior surface of "CLeanTech" is equipped with an antimicrobial coating which can remotely kill viruses and bacteria on human bodies and clothing using photocatalytic and "nano needles" technologies. Prior to entering the enclosed channel, each user of the facility shall first undergo a temperature check. 40-second disinfection and sanitizing

procedures will be carried out within the channel thereafter, during which sanitizing spray will also be applied for instant disinfection. The channel is kept under negative pressure to prevent cross-contamination of the environment inside and outside the channel. Two "CLeanTech" channels are currently deployed at the HKIA for use by staff responsible for public health and quarantine duties.

Intelligent Sterilization Robots (Figure 2)

2.2 Autonomous cleaning robots are deployed at HKIA to ensure that the public areas and passenger facilities are thoroughly disinfected. The locally-developed Intelligent Sterilization Robots, equipped with ultraviolet light sterilizers, 360-degree disinfection spray-heads and 0.3um air filtering, are deployed round-the-clock in public toilets, complimentary shower facilities and other key operating areas in the terminal building to sterilize up to 99.99% of bacteria in the vicinity, including both the air and object surfaces, in approximately 10 minutes. With the lidar sensors installed, the robots can also analyse the environment and adjust the routing autonomously.

Antimicrobial Coating (Figure 3)

2.3 Antimicrobial coating, an invisible coating to destroy viruses and bacteria, is applied to high-touch surfaces in the office and terminal, including toilets, baggage trolleys, check-in counters, seating area in the terminal, seats and handrails of passenger buses and Automated People Movers, and more to protect both the airport staff and passengers. Pilot test on applying the antimicrobial coating to various terminal facilities was conducted in May 2020 and the technology is now being implemented as a long-term measure for terminal disinfection at HKIA.

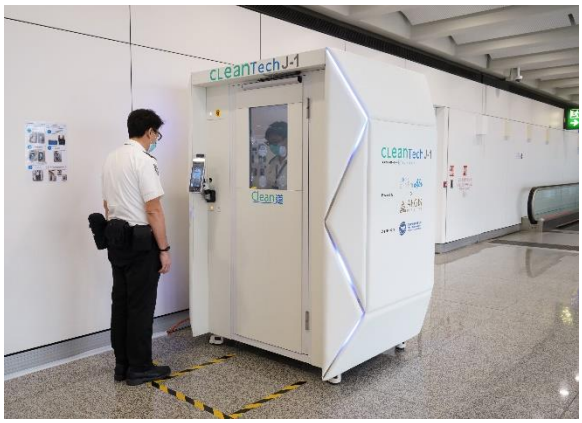

Fig 1. "CLeanTech" disinfection channel


Fig 2. Intelligent Sterilization Robot

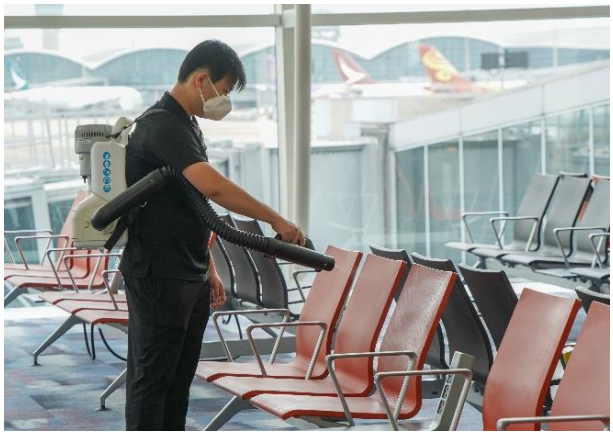
Fig 3. Antimicrobial coating

Part 2: Preparing for the Future Three-Runway System Operations

Digital Apron and Tower Management Systems

2.4 Digital Apron and Tower Management Systems (DATMS) is a project being developed jointly by CAD and AA with an aim to enhancing the safety and efficiency of airfield, apron and tower operations. The systems comprise (1) installation of optical sensors (video cameras) at the aerodrome and (2) an Augmented Visual Presentation that is integrated with essential flight information and real-time operations data.

2.5 With the implementation of Digital Tower technology, development of which is also recommended by ICAO, operational safety can be enhanced with better visibility on the runway and apron traffic at the night time and under adverse weather conditions, whereas operational efficiency can be increased by consolidating aerodrome control positions of various Air Traffic Control Towers into a single location. The technology will also greatly facilitate the real-time operations, where monitoring and control of aircraft movements can be enhanced with the essential flight data tagged on each aircraft under the Augmented Visual Presentation, and various key performance indicators, including on-time performance, parking stand availability, aircraft turnaround process, can be closely monitored with real-time digital tracking of events and objects. In addition to real-time operations, the technology can also assist in the post-incident investigations using the recordings of the runway and apron operations.

2.6 Further to the successful trials conducted at HKIA in 2019, CAD and AA are now developing a Digital Tower Facility and a Digital Apron Management System, with an aim to launching the full system in 2024 to support the future Three-Runway System operations of HKIA.

Fig 4. A successful trial of Digital Apron Management System installed at Integrated Airport Centre

3. ACTION BY THE MEETING

3.1 The meeting is invited to:

a) note the efforts made by the HKIA in safeguarding the health of airport users amid the recent outbreak of COVID-19;

b) note the continual efforts made jointly by CAD and AA in enhancing the airport operational safety and efficiency for building a future-ready airport;

c) share experience and lesson-learnt of different airports in the application of new technologies in enhancing airport hygiene and operational safety and efficiency; and

d) discuss any relevant matters as appropriate.

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