

PASSENGER HEALTH SCREENING

KERI ALLAN ■

Passenger health screening is helping airports build trust and confidence in the public that traveling is safe. *PTW* examines the latest tech being deployed and looks at how a global standardized approach may be needed

Technology for passenger health screening at airports has been thrown into the spotlight in recent months as a result of Covid-19. As the aviation sector begins its recovery phase, many airports are looking at different ways they can ensure the health and safety of passengers and staff. Temperature screening using thermal imaging cameras offers one solution, but according to Airports Council International (ACI) it's not as simple as buying a set of cameras and installing them throughout the airport.

In its *Aviation Operations During Covid-19 – Business Restart and Recovery* report, which was published at the end of May, the ACI stresses that, 'There is no perfect health screening solution and, if required, it is usually a combination of measures that tends to provide best results.'

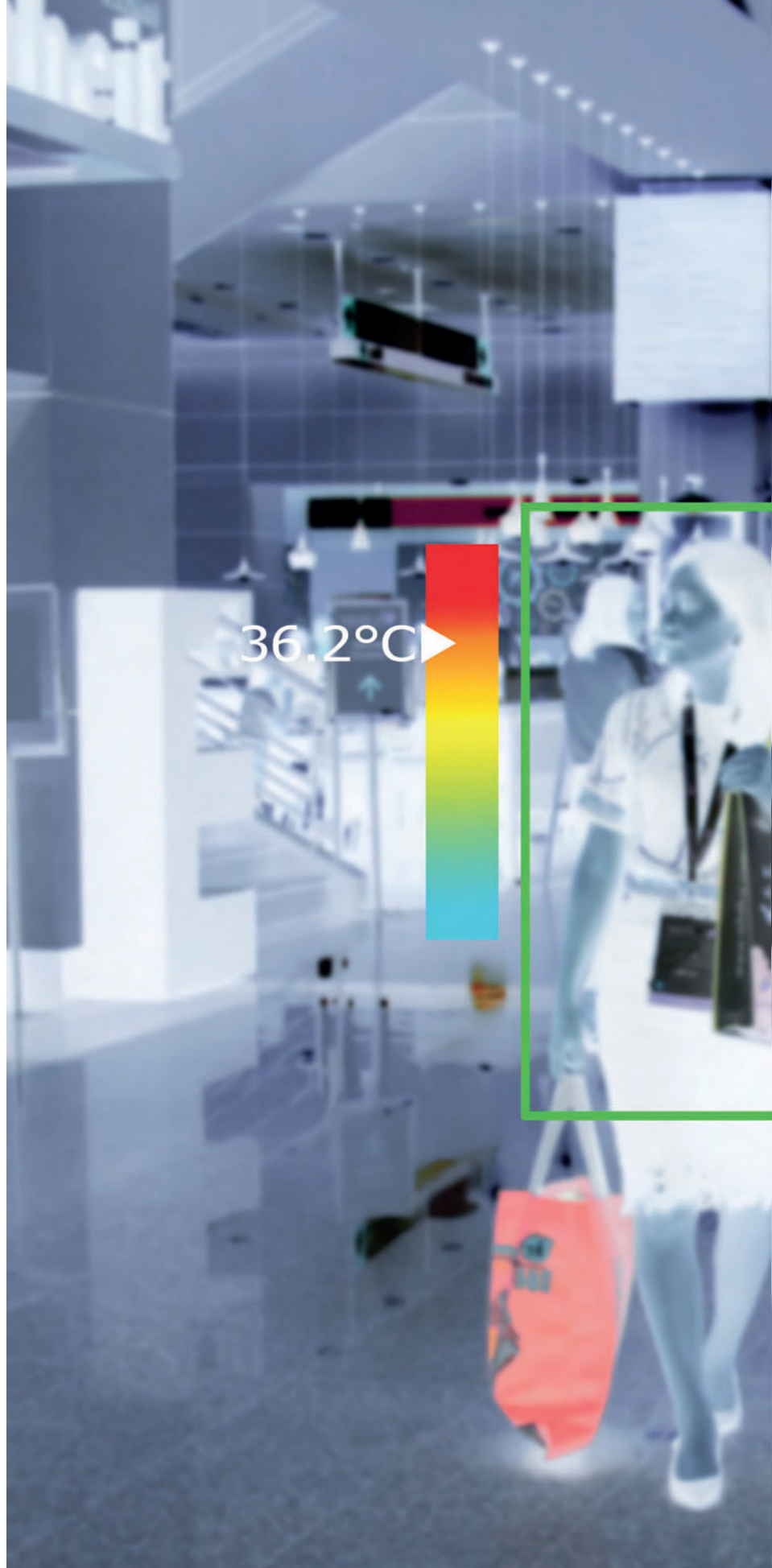
Other measures include passenger questioning through an e-self-declaration process, raising awareness to all staff on what to look for regarding health symptoms when observing passengers, self-service screening to detect a series of indicators such as a passenger's temperature and heart rate, and the issuing of health passports.

Although passenger health screening is just one piece of a much larger puzzle for the restart of aviation, it is important if airports want to gain the trust of travelers. 'These measures may play a useful role in reassuring the traveling public and act as a deterrent for travel in case of suspicion of infection,' ACI's report states.

ACI and ICAO, the latter in its *Aviation Recovery Task Force Report*, agree that if health screening is mandated by governments then it should be introduced as upstream as possible in the passenger process, and carried out in a nonintrusive, walk-through manner.

Thermal imaging cameras

The UK's London Heathrow was one of the first airports to begin trialling thermal screening. The technology, under trial in Terminal 2's immigration hall and in Terminal 5 departures, uses camera detection systems capable of monitoring the temperatures of multiple people moving through the airport. Learnings from these trials will be shared with the UK government, to aid the rapid creation of a common international standard for health screening (read more on Heathrow's Covid-19 measures in *Executive Decisions* on page 46).



Detected!

◀ 37.9°C

◀ 37.2°C

◀ 36.8°C

[PICTURE OF]
health

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Other airports around the world are also investing in or evaluating the use of thermal imaging cameras, such as Los Angeles in the USA, Brussels South Charleroi in Belgium and India's Rajiv Gandhi International, to name just a few.

"At entry points, airports and transportation hubs around the world are deploying thermal imaging scanners as an effective front-line screening tool for detecting elevated skin temperature [EST] of individuals to help reduce the spread of infection," notes Chris Bainter, global business development director of FLIR Systems, a provider of thermal imaging infrared cameras.

Thermal cameras can help speed up the temperature-taking process at airports by removing the need for a manual process by staff, and there are different systems available to suit specific facilities and procedures. "Elevated body temperature [EBT] scanning can be deployed with different types of thermal detection equipment. Some have a narrow field-of-view and work better by scanning passengers one by one, while others are designed to work with a large field-of-view and are therefore more suitable for capturing passengers – and staff – at a pace," adds Dan Jones, client director at Atkins.

FLIR's cameras, which are currently being used by Etihad Airways to screen all passengers traveling on US/UK flights departing from Dubai International, are designed to assess one person at a time and can do so in just five seconds. Nuctech's new FeverBlock infrared temperature measurement system, meanwhile, can scan multiple passengers at the same time. "It's capable of detecting the temperature of up to 200 people per minute," says Li Huayu, assistant president and general manager of international civil aviation at Nuctech (read more on Nuctech's approach to facilitating safe travel on page 65).

Meanwhile, Japan-based NEC Corporation has recently developed a solution called NeoFace Thermal Express, which enables airports to detect the body temperature of passengers. Currently two solutions are available: one for group screening for deployment at entry points and potential high-dwell areas, and one that can provide individual passenger or staff monitoring at a touchpoint.

Environmental conditions

Something that needs to be taken into consideration, however, is that thermal cameras are very sensitive to their environment. "They need to be calibrated well and then remain sensitive to distance from the person and ambient temperature," says James



Some have a **narrow field-of-view** and work better by scanning passengers one by one

Dan Jones, Atkins

ABOVE

Appropriate use of entry and exit screening procedures at airports is currently under assessment by industry experts

Ferryman, professor of computational vision at the UK's University of Reading.

Elenium Automation, a provider of customized passenger and baggage automation systems, claims to have developed a solution that overcomes the issue of fluctuations in the environment. Its sensor array houses a number of cameras and sensors to check a person's temperature, heart and respiratory rates, on a one-to-one basis, without the need to touch anything or interact with anyone. The solution, called Elenium Vitals, can be integrated into kiosks at check-in, bag drop, security and immigration.

"Our kiosks are not diagnostic, but monitoring the three vital signs simultaneously increases the likelihood of identifying illness by almost 50% in comparison with

UK government to trial Covid-19 detection dogs

In May 2020, the UK government announced plans to trial specially trained Covid-19 dogs to find out if they can detect the virus in humans, even before symptoms appear. Researchers at the London School of Hygiene and Tropical Medicine (LSHTM) will carry out the first phase of a trial in collaboration with the charity Medical Detection Dogs and Durham University. The dogs used will be a mixture of labradors and cocker spaniels.

The trials will see National Health Service staff in London hospitals collect odor samples from people who are infected with coronavirus and

those who are uninfected. The six bio-detection dogs will then undergo thorough training to identify the virus from the samples.

According to Medical Detection Dogs' research, dogs, which could each screen up to 250 people per hour, can be trained to detect the odor of disease at the equivalent dilution of one teaspoon of sugar in two Olympic-sized swimming pools of water.





doing only a temperature check,” says Aaron Hornlimann, chief executive officer of Elenium.

Etihad Airlines has recently installed the Elenium kiosks at UAE’s Abu Dhabi International. If the system detects any vital sign irregularities, it will suspend the process and switch to a teleconference, or alert staff to take on the assessment and management of the travel process. “We will also be implementing our solution in Avalon Airport in Australia in the coming months and we have a number of partners undertaking trials globally, from Asia-Pacific to the USA,” adds Hornlimann.

According to Elenium, the solution uses a thermal management system which detects minor fluctuations in the environment it’s installed in. “This allows us to consistently come to within 0.5° of non-invasive febrile temperature screening – the ISO standard for reading skin temperature using a thermal camera,” Hornlimann continues.

“How and where you measure vital signs, specifically temperature, also makes a significant difference to accuracy. Blood supply in the head differs from person to person, so Elenium Vitals is able to target the correct area by defining where the blood vessels are and evaluating temperature across the key points.”

Location, location, location

In its *Aviation Recovery Task Force Report*, ICAO suggests that any health screening measures should be located separate from security screening so they don’t distract security workers from doing their jobs. “How health screening forms part of an overall resilient airport system is a key consideration, and needs to take into account the specifics of an individual airport, terminal configuration and environmental constraints,” says Atkins’ Jones. “Simple things such as how

ABOVE
FLIR thermal imaging is becoming a first line of defense in stopping the spread of Covid-19



LEFT
HKIA’s aggressive strategy has involved the installation of infrared screening tech

Infrared temperature screening **systems have been installed** at all major entrances to the terminal

Steven Yiu, HKIA



passenger flow is affected by existing physical infrastructure can determine where to locate the screening capabilities.”

Andreas Hofmann, director of business development at Amorph Systems, a provider of advanced IT solutions to monitor and control logistics processes for airports, adds, “Current trends show that multiple checks will be done. Filling out a health pass at home prior to traveling could be part of this approach, as well as a sequence of on-site checks at the airport.”

Some airports have set up passenger screening outside terminal entrances. At Vilnius International in Lithuania and Hong Kong International (HKIA), for example, only passengers and staff who have successfully passed a thermal inspection are allowed to enter the terminal building.

“Infrared temperature screening systems have been installed at all major entrances to the terminal building. Suitable for monitoring crowded areas with fast people flow, it provides real-time detection while minimizing human interaction – lowering the risk of transmitting the virus,” says Steven Yiu, deputy director of service delivery at HKIA.

Other screening areas may be set up at check-in or security for outbound passengers, and gate rooms and immigration halls are perfect for screening arrivals outside. “For arriving passengers, a temperature check is conducted at the gates immediately after they disembark,” Yiu explains. “They’re also required to submit a health declaration form and follow the Hong Kong government’s quarantine agreement, which is conducted at the arrival hall.”

Remote screening

A number of technologies are now available for remote screening of large groups of people, enabled by centralized image processing. This can reduce queuing and remove bottlenecks, while minimizing contact between staff and passengers. Some of the latest systems to hit the market include an additional layer on top of the thermal detection

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cameras and base software. This can include AI and deep vision analytics that support screening operatives by detecting and following passengers who need to be assessed further.

Take Oversight's 3D smart monitoring system, for example. Its 3D semantic camera system has recently been used in two areas of Paris-Charles de Gaulle in France to analyze the flow of people and how they interact with airport devices. However, the technology is also capable of detecting whether passengers are wearing face masks and respecting social distancing throughout the terminal.

With the addition of a thermal camera, the system could also be set up to flag any passengers with a high temperature. Furthermore, it is capable of following each passenger's movements, enabling operators to find and contact at-risk individuals anywhere within the facility. "With our system you can monitor 100% of passengers, but you will only have to act when needed, which means the normal flow of people is unaffected," says Raul Bravo, CEO and co-founder of Oversight.

Another example comes from a consortium of businesses including Amorph Systems and Vantiq, which has developed an infection detection and containment system (IDCS) that limits transmission of Covid-19 through real-time thermal monitoring. Although the product was only launched in May, the consortium is already in talks with more than 25 global airports and integrators.

The new solution automatically enforces access control to buildings through thermal-sensing algorithms and the use of Bluetooth and wi-fi among other technologies for effective tracking. It alerts staff to potentially unwell passengers and contaminated areas, enabling them to quickly redirect passenger flow, reposition flights and reallocate staff while the passenger is assessed, taken to hospital if necessary and the area disinfected.

"The benefits to airports of an automated system like this, rather than manual checks, are very clear: reduction of costs, safety for staff and passengers, and more fluent processes," says Hoffmann.

It is important to note that passenger screening is only a precautionary step – just one part of a layer of measures that allow airports to respond to the threat of Covid-19. According to Atkins' Jones, it's also important that airports, airlines and health authorities work together to ensure there isn't a siloed approach to managing the virus. "Clarity will also be required on who has responsibility for each stage of the screening process and, critically, who is legally able to deny a passenger the right to fly," Jones adds. ■

RIGHT

If an individual is shown as having an elevated body temperature, they may be asked to go for further checks



With our system you can **monitor 100%** of passengers, but you will only have to act when needed

Raul Bravo, Oversight



FAR LEFT

A musician performs for a single listener at Stuttgart Airport. Photo: Patricia Neligan

LEFT

Vilnius Airport offers the ideal setting for a drive-in cinema

SIX WAYS AIRPORTS REPURPOSED THEIR FACILITIES DURING LOCKDOWN

1

Many of the UK's airports assisted the national response to the pandemic by turning their parking facilities into drive-in Covid-19 testing centers, which were operated by military personnel. This included Bristol, London Stansted, Glasgow, London Luton and London Heathrow.

2

Vilnius Airport in Lithuania converted its airside apron into a drive-in cinema during April and May, in a project called Aerocinema – The Journey Begins. It was organized by those behind the Vilnius Film Festival, which had to be canceled in March, and cars had to park 2m apart with only two people allowed per car.

3

London Heathrow became a refuge for the homeless during the pandemic, sheltering a number of rough sleepers during a time when the usual facilities the homeless relied upon had been forced to close. Staff there worked with the local council and agencies to try to find safe alternatives for those without a home.

4

One of the hangars at the UK's Birmingham Airport was converted into a temporary central morgue for the West Midlands during the pandemic, providing a place for up to 1,500 bodies to be stored if needed.

5

Stuttgart Airport in Germany held the world's first 1:1 concert in an airport in May, when it transformed one of its check-in halls into a music venue as part of a special initiative in collaboration with the Stuttgart State Opera and SWR Symphony Orchestra. It followed this up in June with a four-week festival of music and comedy events that people can watch on a giant screen from the comfort of their cars.

6

Copenhagen and Aalborg airports in Denmark teamed up with Live Nation to hold drive-in music concerts. At Copenhagen, 600 cars and 2,500 people attended the concert. Video platform Zoom was used to connect fans in their cars with artists.