

Metal detectors in airports engineering essay

[Environment](#), [Air](#)



As we all know, airport security has persistently improved. Without safely airports can't be operate. On the other side, passengers would be afraid to fly because of fear it can have a bad effect on airline. Typically, airlines lease private companies to keep airports safe by some devices such as: walk through metal detector, X ray and so on. Metal detectors are prevalently used to discover metal objects like for example: weapons and knives that passengers can not take it to plane. This device also used in some building which security is a concern. This report includes the main points of: probe about the airport and the technologies that they use. Then in scenario we'll have how this technology is exceedingly functional. definition of metal detector. In addition, we will find out that some advantages and disadvantages that emerge of this technology. Then, we will discuss about similarities and differences between Human Aspect, Ethical, Enterprise Computing with the topic above. Finally, in the recommendation part, we'll discuss about what we need to do to improve this technology.

Introduction

I feel it's necessary to clarify that nothing is more important than being safe. It means, unmistakable illegal act is increasing more and more each day. So, we need to stop it but unfortunately it's not easy and criminals are adept on their work. Accordingly, we should enhance our technologies and innovations. On the other side, we should think about the ways that can reduce crimes because it is almost impossible to get rid of that. As experience has shown, airport is one of the sensitive places that need to be preserved. Therefore, all airports must require to have tough security or else that can be extremely dangerous not even for passengers it also can be a threat for a

person who just sit at home and read news paper! We can remember the disaster event on september. 11 many people was dead on that happen. I believe that, Criminals do what ever for achieve thier goals and if we don't stop them they will stop us. So, we can't neglect to attention of airport. In this particular case, we should utilize of new technologies at the airport such as: security camera, Walk-through metal detector, Digital radiographic (X-ray) body scanner, X-ray backscatter scanner, Millimetre wave body scanner and Handheld metal detector / gloves. Now we can focus on our main location which is an international airport in Hong Kong and they use of these technologies to prevent illegal act and they also try to protect of people. It might be helpful to have an introduction of the airport and management part.

The Airport Authority Hong Kong (AA) is a statutory body with a mandate to maximise the value of Hong Kong International Airport (HKIA) for the benefit of the territory. Established in 1995 to operate and maintain HKIA, and with an emphasis on enhancing Hong Kong's status as a major centre of international and regional aviation, the AA is wholly owned by the Government of the Hong Kong Special Administrative Region (HKSAR). The AA is governed by the Airport Authority Ordinance and its Board comprises a Chairman, CEO and between eight to 15 other members. With a management team strengthened by expertise from the commercial sector, AA's 1, 100-strong staff take an entrepreneurial approach to developing HKIA into a preferred international and regional aviation centre and an engine of economic growth for Hong Kong. With this objective in mind, the AA's business philosophy is to further expand HKIA's global aviation network and

provide passengers with more destinations, greater frequency of flights and a wider choice of carriers. Riding on Hong Kong's strategic location and HKIA's world-class facilities, the AA is extending the airport's home market to the Pearl River Delta area and beyond. The AA remains committed to the highest possible levels of security and safety. It works to continuously raise security standards while minimising delay and inconvenience to passengers. As a responsible corporate citizen, the AA initiates and takes part in a wide range of programmes and activities that promotes environmentally friendly practices, people development and community betterment.

(www.hongkongairport.com)

Mission:

To strengthen Hong Kong as a centre of international and regional aviation by:

Upholding high standards in safety and security;

Operating efficiently with care for the environment;

Applying prudent commercial principles;

Striving to exceed customer expectations;

Working in partnership with stakeholders;

Valuing human resources; and

Fostering a culture of innovation

(www.hongkongairport.com)

Aged 61. Appointed as Chairman of the Board in June 2008. First appointed as Member of the Board in June 2003 and was re-appointed in June 2005.

Non-official Member of the Executive Council. Chairman of the Council of the Hong Kong University of Science and Technology. Member of the Exchange Fund Advisory Committee. Independent Non-Executive Director of the Hong Kong Exchanges and Clearing Limited, Hang Seng Bank Ltd, HKR International Ltd and HSBC Holdings plc.

Airport Ambassadors' duties include:

- Greeting passengers;
- Answering passenger enquiries and giving directions;
- Offering assistance to passengers in need;
- Promoting passenger safety; and
- Assisting at special events.

Airport Ambassadors are committed to:

- Continuously improving customer service of the airport;
- Taking the initiative to assist passengers;
- Welcoming passengers with friendly smiles; and
- Promoting passenger safety.

(www.hongkongairport.com)

Scenario

With this introduction we may now turn to our main discussion about how we can have a secure airport and how metal detector is extremely functional.

Basically, walk-through metal detectors used to find metal weapons and metal object. I believe that, all devices have some problems that it needs to improve. But most of these device are useful except some of them which is useless. So, we should focus on devices which is useful and try to eliminate problems that emerge on them. After this scenario, I feel it is vital to have a definition of metal detector.

Walk-through metal detector

A metal detector is a device which utilize electromagnetic induction to discover metal. This is also the prevalently used system at most international airports. Regular calibration of the archway is demanded to ensure stable detection performance.

(www.legco.gov.hk/yr09-10/english/.../se/.../se_phsw1116cb2-257-1-e.pdf)

This device can fall into thirteen main part as demonstrate below:

1. 2. 1 Alarm Indication

A signal to warn of the detection of a metal object. The indication can be visual and/or auditory.

1. 2. 1. 1 Positive Alarm Indication

The change in the alarm indication that corresponds to the detection of a metal object. Typically,

the alarm indication is off until a metal object is detected.

1. 2. 1. 2 Proportional Alarm Indication

An alarm indication proportional to the size, proximity, orientation, and material of an object.

1. 2. 2 Alarm Indicator

The device used to generate the alarm indication. For a visual indication, the alarm generating

device can be a light bulb, lamp, light emitting diode, etc. For an auditory indication, the alarm

generating device can be a horn, siren, buzzer, or similar item.

1. 2. 3 Active Detector

An active detector is generally a device that generates energy for illuminating the portal region of

the detector. For the walk-through metal detector, the generated energy is in the form of a magnetic

field. The interaction of the generated magnetic field with certain types of objects in the portal region of

the detector and the ability to detect this interaction is the basis of operation for walk-through metal detectors.

1. 2. 4 Clean Tester

A person who does not carry any electrically conductive and magnetizable objects such as metallic

belt buckles, metal buttons, cardiac pacemaker, coins, metal-frame eyeglasses, hearing aid, jewelry,

keys, pens and pencils, shoes with metal arches or supports, metallic surgical implants, undergarment

support metal, metal zippers, and similar items, which would significantly alter the signal produced when

the person carries a test object.

1. 2. 5 Detection

The discovery or finding of a metallic object. The detection of a metallic object is transmitted to the

operator by some type of alarm indicator, typically a visual or audible indicator.

1. 2. 6 Detector Axis

An imaginary line passing through and perpendicular to the detector plane that is centered

vertically and horizontally within the portal of the walk-through metal detector and points in the direction

of the subject's motion through the portal.

1. 2. 7 Detector Floor

The bottom plane of the detector portal.

1. 2. 8 Detector Mount

A nonconductive, nonmagnetic platform on which the walk-through metal detector rests. The

detector mount locates the detector floor at a height of 32.5 cm (12.8 in) and contains grooves at

10 cm (4 in) below its top surface to facilitate the metal floor test required under section 3.4.2. The

1. 2. 9 Detector Plane

An imaginary plane (two-dimensional surface) that is parallel to the portal of the walk-through metal

detector and that bisects the sensor region into two symmetric halves. The detector plane contains

two orthogonal axes labeled the “x” axis and the “z” axis.

1. 2. 10 Detector Positioner

A nonconductive, nonmagnetic device that fixes the position of the detector plane and detector

axis with respect to the three-axes translation system. The detector positioner includes a reference

surface for attaching the detector mount. The detector positioner also includes a surface for attachment to the three-axes translation system.

1. 2. 11 Detector Response

The electrical signal generated by the sensor or sensor circuit of the detector and caused by an object interacting with the magnetic field generated by the detector. The detector response is the basis on which an alarm indication is derived.

1. 2. 12 Ground Surface

The surface on which the walk-through detector rests.

1. 2. 13 Measurement Coordinate System

A mutually orthogonal three-dimensional Cartesian coordinate system referenced to the detector

axis and the detector plane. The three axes are labeled " x," " y," and " z," where the y axis is parallel

to the detector axis and the x and z axes are in the detector plane. The orientation of the test objects

and direction of the magnetic field is referenced to the measurement coordinate system.

(www.ncjrs.gov/pdffiles1/nij/193510.pdf)

Advantages and disadvantages

Many years that Metal detector have been used. In this part I want to focus on some advantages and disadvantages that appear in this device.

The advantages of a walk-through metal detectors include :

no radiation is generated during screening;

easy installation albeit bulky by comparison to handheld metal detector;

high speed detection capability (about 15 milliseconds); and

the capability to detect large metal objects like knives and guns.

The disadvantages of a walk-through metal detector include :

it only detects metallic objects;

it is easily interfered with by metals that exist in the building environment such as ceiling with metallic materials and iron reinforcing bars in walls and floors; and

the need for regular calibration to ensure stable detection performance.

(www.legco.gov.hk/yr09-10/english/.../se/.../se_phsw1116cb2-257-1-e.pdf)

There is yet another problem with conventional walk through metal detectors is that they are heavy and difficult to move various locations. Another problem with conventional walk through metal detectors is the power

<https://assignbuster.com/metal-detectors-in-airports-engineering-essay/>

consumption of the electronic system limits the detectors ability to operate from a battery source for more than a few hours, requiring AC power to be accessible for either operation, or frequent battery recharging.

(www.freepatentsonline.com/7145456.html)

Similarities and differences between human aspects with topic above:

(HCI) human computer interface. This sentence can be divided into three main categories: human which means all individual or group of users that they work together and they use of technology. As we all know, computer is not only include PC or laptop. So, any technology such as photocopiers, hair dryer, metal detector, etc. can be a computer. Interaction is Communication between user and computer. If we focus on human computer interface it's obvious that the essential part of that is about Concern with the user execution and Produce utilizable and secure system as well as practical system. It also tries to improve some important parts such as: Safety, usefulness, impressiveness, competence, convenience for use and Simplicity.

Another similarity between this device with (HCI) is about health concerns. There's no radiation is created during screening. Accordingly, it can't be dangerous for users. It is also ergonomic because of efficiency and safety.

There is different between this device with (HCI) is about green computer which try to decreasing electricity and environmental waste during using computer and one of the important problem is about battery that we explained in disadvantages part.

<https://assignbuster.com/metal-detectors-in-airports-engineering-essay/>

Similarities and differences between securities with topic above:

As indicated, walk through metal detector is a computer that needs to be concerned and can't neglect to it. In this case, we can mention computer security risk which is an action that causes defeat of or damage to computer system. At this point, I think it is helpful to have some information about system failure that induced by aging hardware, natural disasters, or electrical power disturbances. In addition, there might be overvoltage or power surge that can help to system failure to damage the device. So, we should install a surge protector which protects computer and equipment from electrical power disturbances and it also,

Uninterruptible power supply (UPS) that provides power during power loss. On the other side, consideration to some factors as an example of air humidity is compulsory.

The difference between security and the metal detector is that in some kind of these devices the companies have installed a camera that can record video for about 24 hours and it also can take back up of that. As we know, there are four types of back up: full, differential, incremental and selective. But in these devices we only have one option which is full.

Similarities and differences between Ethical with topic above:

proposals

As this device is exceedingly functional we need to improve it as well as we can. Therefore, I have some idea to make it better. In my view, this device

can be more helpful as long as it use less electricity, in this way we are more close to green computer.

Another concept that I feel it might be helpful is that, install security camera that can record video with zoom ability. This way can help to recognize a person who we're looking for.

As we all know, if we wear metal belt we can't pass through the walk through metal detector and it's a big problem because at the airport passenger need to get their belt off. On one hand, it takes time. So, i believe that we can create a device to scan passengers body to detect it. Then, we can figure this problem out.

Conclusion

In sum up, I reflect my opinion again and assert that, in my view, we should enhance our technologies and use those in appropriate ways. As I've probed about the airport that uses metal detector to discover weapons and some illegal metal objects and if they don't use of the device what can happen. I have also expounded how that device can be exceedingly functional at the airport. In addition, I notified some advantages and disadvantages that emerge in metal detector. Afterwards, I claimed some similarities and differences between the topic above with security , Human Aspect and Finally, I've also illustrated some recommend that we how we can eliminate disadvantages in metal detector in that way this device can be more useful.

References

Information about the airport such as manager, history, mission and duties.

<https://assignbuster.com/metal-detectors-in-airports-engineering-essay/>

(www.hongkongairport.com)

Defination of the device

(www.legco.gov.hk/yr09-10/english/.../se/.../se_phswHYPERLINK “
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http://www.legco.gov.hk/yr09-10/english/.../se/.../se_phsw1116cb2-257-1-e.pdf”-e.pdf)

Parts of metal detector:

(www.ncjrs.gov/pdffiles1/nij/193510.pdf)

Some of Advantages and disadvantages

(www.freepatentsonline.com/7145456.html) and

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