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COMMUNICATION FROM THE COMMISSION TO THE EUROPEAN PARLIAMENT AND THE COUNCIL

on the Use of Security Scanners at EU airports

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(Text with EEA relevance)

1. INTRODUCTION

1. This Communication addresses an increasing and use of Security Scanners at the airports of the European Union regulated at national level. Different standards of scanners currently deployed in Europe bring a serious risk of fragmenting fundamental rights of EU citizens, impeding their rights of free movement and escalating their health concerns related to new security technologies. While Security Scanners are still exceptional at European airports, there is a growing need to swiftly address these concerns and find a common solution.

2. The Communication examines arguments that only the common European standards for aviation security can provide the framework ensuring a harmonised approach to the use of Security Scanners at airports. It looks at how such a harmonised approach should incorporate EU fundamental rights standards and a common level of health protection to allow adding this technology to the existing list of eligible equipment for screening persons at airports.

2. GENERAL CONTEXT

2.1. The Aviation Security context

3. A common European aviation security policy has been developed in the aftermath of the 9/11 attacks. Before 2001 aviation security was the responsibility of individual states. Since that event a Community policy was developed and international cooperation on security issues has considerably increased. Serious security incidents have triggered discussion and reaction at international level.

4. Already in December 2001 the so-called shoe bomber who endeavoured to hide explosives in the heel of his shoes made some states introducing specific measures to better screen shoes. In 2006 an attempt to blow up several aircraft over the Atlantic through the use of liquid explosives led to the prohibition of liquids on board aircraft in Europe and several other states.

5. On 25 December 2009 the attempted terrorist attack with hidden explosives on Northwest Airlines flight 253 from Amsterdam to Detroit reminded of the limits metal detectors, commonly used at airports, have in detecting non-metallic threat items on persons. As an immediate reaction, several states have speeded up the further development and eventual deployment of more advanced technology capable to also detect non-metallic and liquid explosives. Additional security measures for screening passengers were put in place for US bound flights.

6. These incidents highlight the fact that aviation security is facing new types of threats today; threats to which the traditional security technologies used at airports can't give an adequate and efficient response. Consequently, some EU Member States started to

trial and deploy Security Scanners at their airports. This is resulting in different rules being used across the EU.

7. The analysis of Security Scanners' performance capability as well as their potential impact on health and fundamental rights has been ongoing in the EU for some time. In order to end the current fragmented situation wherein Member States and airports decide ad-hoc if and how to deploy Security Scanners at airports (see next chapter), the use of Security Scanners must be based on common standards, requesting basic detection performance and imposing safeguards to comply with European fundamental rights and health provisions.

8. The present Communication aims at providing a factual basis for discussing the key issues associated to the possible introduction of Security Scanners as a measure for screening persons at EU airports.

2.2. Fragmentation in the Member States

9. In accordance with EU law, Member States may introduce the use of Security Scanners at their airports either i) by exercising their right to apply security measures that are more stringent than existing EU requirements or ii) temporarily, by exercising their right to conduct trials of new technical process or methods for a maximum period of 30 months[1].

10. Equipment trials may be performed to evaluate new technologies; formal trials of Security Scanners as a primary method for screening passengers were undertaken in Finland, at Helsinki -Vantaa airport, in the UK, at London Heathrow airport and are ongoing at Manchester airport[2], and in the Netherlands, at Amsterdam Schiphol airport. Recently also France[3] and Italy[4] have begun testing. To Commission's knowledge no other Member States deploy Security Scanners.

11. At present the situation in Europe is fragmented as Security Scanners, where used, are not systematically and uniformly deployed by Member States at their airports. In addition, their use is not harmonised in terms of operational conditions as they are regulated at national level. Consequently, passengers are suffering from additional unnecessary screening and cannot benefit from the principle of one stop security.

2.3. Concerns raised in relation to the use of Security Scanners at EU airports

12. The concerns raised over past years on the use of Security Scanners for screening at airports relate primarily to two issues, the creation of body images and the use of x-ray radiation. First, until recently all Security Scanners produced images of the screened person's body in order to allow a human reviewer of these images to assess the absence of items prohibited from being brought on board aircrafts. Second, part of the Security Scanner technologies emit low doses of radiation, ionising (x-ray) and non-ionising, for detection purposes. In particular, the use of ionising radiation raises health questions.

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1 Legal basis for trials: Chapter 12.8 "Methods of Screening using new technologies" of Commission Regulation (EU) No 185/2010 (former Article 4 of Commission Regulation (EC) No 820/2008).

2 As of 3 May.

3 On 22 February 2010 France started to screen passengers on a voluntary basis for flights to the US. The technology used is based on active millimetre waves and is deployed at Paris Charles De Gaulle airport, terminal 2E.

4 Italy is looking at two types of security scanners: low energy X-ray, and active millimetre waves. The latter would be tested at Rome and Milan airports for six weeks.

13. Today technologies exist that neither produce images nor emit radiation, however the two concerns raised above have created a fierce debate on the Security Scanner's compliance with fundamental rights and public health principles and legislation, applicable in the EU.

14. All EU legislation, including legislation on aviation security, and its application must fully comply with fundamental rights and health standards established and protected by European Union law.

15. Fundamental rights are protected by the Charter of Fundamental Rights of the European Union and by several acts of secondary EU legislation. In the context of Security Scanners in particular human dignity (Article 1), respect for private and family life (Article 7), protection of personal data (Article 8), freedom of thought, conscience and religion (Article 10), non-discrimination (Article 21), the rights of the child (Article 24) and ensuring a high level of human health protection in the definition and implementation of all Union's policies and activities (Article 35) must be mentioned.

16. Respecting the right guaranteed by the Charter and secondary legislation does in principle not prevent the adoption of measures restricting these rights. However, any limitation must be provided for by law and respect the essence of these rights. It must be justified, which entails that it is necessary for and capable of meeting objectives of general public interest (for example aviation security) recognised by the European Union and respect the principle of proportionality.

17. As concerns health and more particular the use of ionising radiation European legislation under the Euratom Treaty sets thresholds for radiation doses (ad hoc and per year), requires legitimate justification for human exposure to radiation and requests that protection measures ensure exposure as low as possibly achievable.

18. Exposure to some radiation – including ionising - is part of daily life. In addition, limited exposure of human beings to radiation is as such not prohibited but Member States must prove compliance with EU legislation principles for each category of cases. Frequent (for example, exposed workers) and non-medical exposure to radiation may trigger the application of stricter rules.

2.4. Legislation and main principles of aviation security

19. European legislation laying down common standards for aviation security was adopted in 2002[5]. At first it followed almost to the letter international standards on aviation security as laid down in Annex 17 of the Chicago Convention[6] and further developed through International Civil Aviation Organisation (ICAO). In relatively short time the need for a more detailed harmonisation of the European rules became necessary and several acts of implementing legislation were added[7]. A main overhaul of the European legislative framework has been completed and has fully replaced the existing rules as of 29 April 2010.

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5 Regulation (EC) No 2320/2002 of the European Parliament and of the Council of 16 December 2002 establishing common rules in the field of civil aviation security (OJ L 355, 30.12.2002).

6 Convention on the International Civil Aviation signed on 7.12.1944.

7 The most important implementation acts are Commission Regulation (EC) No 622/2003 of 4 April 2003 laying down measures for the implementation of the common basic standards on aviation security (OJ L 89, 5.4.2003) replaced by Regulation (EC) No 820/2008, laying down measures for the implementation of the common basic standards on aviation security of 8.8.2008 (OJ L 221, 19.8.2008).

20. The main principle of European as well as international rules is to keep threat items such as arms, knifes or explosives ("the prohibited articles") away from aircraft. For that reason every passenger, every piece of luggage and cargo departing from an EU airport, or coming from a third country and transferring through an EU airport, must be screened or otherwise controlled in order to ensure that no prohibited articles are being brought into security restricted areas of airports and/or on board aircraft. Further elements of aviation security legislation are: (1) inspection powers (and obligations) granted to the Commission and Member States' authorities responsible for aviation security to ensure continuous compliance with the rules at airports; (2) the possibility for Member States to set more stringent security measures in case of increased risk and (3) regular coordination meetings on aviation security with Member States experts and industry several times a year.

21. This common regulatory framework enabled 'One-stop security' within the European Union which is the most important element of facilitation, both for the industry as well as passengers. This implies that passengers (or luggage or cargo) arriving from another EU airport, do not need to be re-screened when transferring[8]. 'One stop security' has been successfully extended to 3rd countries[9] with equivalent levels of aviation security. Further extension is under preparation.

2.5. Long term challenges of aviation security

22. There is an ongoing discussion on the future of aviation security. During recent years it has considerably changed the operation of airports and flights. Yet security is not the only objective to which airport operations aim.

23. European airports are part of the EU border line. In this function they perform, beyond aviation security, a large number of public interest tasks and provide services in relation to immigration and customs and also assist in fighting crime (drug smuggling, human trafficking, counterfeiting, etc). The same security methods and/or technologies employed in civil aviation may be used for different objectives[10]; however most often different tasks require special approaches of screening and controlling. Every change in law, every new task tends to add additional layers of measures – and every citizen travelling by air experiences their effects. Therefore, it is a valid question whether adding new security layers after every incident is an effective means to improve aviation security.

24. Indeed, adding new layers of methods and technologies after each incident proves more and more inefficient. Security checkpoints become overburdened with new equipments and the operation of newly developed security tasks. A more holistic approach is required, in which enhanced intelligence sharing and human factor analysis, such as behavioural observation would constitute key elements in the future.

25. The Commission Security Research Programme supports the development of new technologies for aviation security and will continue to monitoring further developments of Security Scanners.

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8 The majority of Member States apply the concept of 'One-stop-security'.

9 Switzerland, Norway and Iceland.

10 e.g. passport checks are undertaken for immigration reasons but may also be employed in order to fight criminal or other offences; e.g. to prevent passengers from carrying arms ensures aviation security (as well as safety and security in general on board flights (difference between aviation security and security on board flights is not clear).

3. THE EU CONTEXT

3.1. Legal basis for aviation security equipment and control methods

26. Under the EU legal framework for aviation security[11], Member States and/or airports are given a list of screening and controlling methods and technologies from which they must choose the necessary elements in order to perform effectively and efficiently their aviation security tasks.

27. The current legislation does not permit airports to replace systematically any of the recognised screening methods and technologies by Security Scanners. Only a decision of the Commission supported by Member States and the European Parliament[12] can be the basis for allowing Security Scanners as a further eligible method for aviation security. However Member States are entitled to introduce Security Scanners for airport trials[13] or as a more stringent security measure than those provided for by EU legislation[14].

3.2. Commission's proposal of 2008 and follow up

28. Based on the positive vote of the Member States' aviation security experts[15], the Commission proposed to the Council and the European Parliament a draft regulation with basic screening requirements to be further developed in implementing legislation at a later stage on 5 September 2008. Included in this act was a list of screening methods and technologies that contained Security Scanners as one of the recognised means for screening persons.

29. The European Parliament, on 23 October 2008, adopted a resolution on the impact of aviation security measures and body scanners on human rights, privacy, personal dignity and data protection requesting a more in-depth assessment of the situation[16]. The Commission agreed to review these matters further and withdrew Security Scanners from its original legislative proposal. The draft legislation became Commission Regulation (EC) No 272/2009[17] to apply as of 29 April 2010, when the new set of aviation security legislation entered into force.

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11 Aviation Security EU legislation as of 29 April 2010: (full application of) Regulation (EC) No 300/2008 of the European Parliament and of the Council of 11 March 2008 on common rules in the field of civil aviation security and repealing Regulation (EC) No 2320/2002 (OJ L 97, 9.4.2008); Commission Regulation (EC) No 272/2009 of 2 April 2009 supplementing the common basic standards on civil aviation security laid down in the Annex to Regulation (EC) No 300/2008 of the European Parliament and the Council (OJ L 97, 3.4.2009); and finally the so-called implementing package containing Commission Regulation (EU) No 185/2010 of 4 March 2010 (OJ L 55, 5.3.2009), and further implementing acts.

12 Amending Commission Regulation (EC) No 272/2009 and under comitology procedure.

13 Commission Regulation (EC) No 185/2010: Finland, France, The Netherlands, Italy and the UK have already introduced Security Scanners according to existing EU legislation.

14 Article 6 on more stringent measures of Regulation (EC) No 300/2008.

15 Aviation Security Committee of 9/10 July 2008.

16 The EP Resolution (2008)0521 asked the Commission to: carry out an impact assessment relating to fundamental rights; consult the European Data Protection Supervisor (EDPS), the Article 29 Working Party and the Fundamental Rights Agency (FRA); carry out a scientific and medical assessment of the possible health impact of such technologies; carry out an economic, commercial and cost-benefit impact assessment.

17 Commission Regulation (EC) No 272/2009 of 2 April 2009 supplementing the common basic standards on civil aviation security laid down in the Annex to Regulation (EC) No 300/2008 of the European Parliament and of the Council (OJ L91, 3.4.2009, p. 7).

30. Pursuant to the European Parliament's Resolution and to further assess the situation the Commission organised a meeting with stakeholders[18] and launched a public consultation at the turn of 2008/2009. Approximately 60 stakeholders have provided the Commission with information and their opinions on Security Scanners as technology to be applied in aviation security. Overall the views on the potential of Security Scanners were positive, although several serious fundamental rights and health concerns were raised on the basis of the then available technological solutions.

31. In 2009 the European Data Protection Supervisor (EDPS), the Article 29 Data Protection Working Party[19] and the Fundamental Rights Agency expressed reservations towards Security Scanners creating images while screening as those were considered to have a great impact on privacy and data protection of passengers. Only if the necessity of their use is properly established in line with data protection requirements and rights of individuals at airports guaranteed, Security Scanners could be – in their view - considered as appropriate[20]. In 2010 the EDPS stated that "… there are now models which appear to be more compliant with EU law and the aforementioned position adopted by EDPS and WP 29"[21].

4. SECURITY SCANNERS AS A TOOL TO ENHANCE SECURITY

4.1. What are Security Scanners and what can be their role in aviation security

32. Security Scanner is the generic term used for a technology that is capable of detecting objects carried under clothes. Several forms of radiation differing in wavelength and energy emitted are used in order to identify any object distinct from the human skin. In aviation Security Scanners could replace walk-through metal detectors (capable of detecting most knives or arms) as means of screening passengers because they are able to identify metallic and non-metallic objects including plastic and liquid explosives.

33. When a Security Scanner clears a person, in principle no further searches or screens are necessary. Today walk-through metal detectors' weakness in identifying non-metallic items require screeners to undertake full body hand searches in order to achieve comparable results.

34. In aviation security, Security Scanners may, therefore, fully substitute walk-through metal detectors and to a large extent full body searches.

4.2. Technology

35. Various technologies of Security Scanners are being developed. Existing and commercially available scanners generally use one of following technologies:

(1) **Passive millimetre-wave**: Passive millimetre-wave systems form an image from the natural millimetre-wave radiation emitted by the body, or reflected from the surroundings. These systems do not emit radiation and produce

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18 1. Task Force meeting on 12 December 2008.

19 The Working Party on the `Protection of Individuals with regard to the Processing of Personal Data` set up by Article 29 of Directive 95/46/EC on the protection of individuals with regard to the processing of personal data and on the free movement of such data.

20 See for instance, Letter from Chairman of Article 29 Working Party to Directorate-General Transport of 11.2.2009 and enclosed consultation.

21 Reaction of the EDPS on the Meeting of LIBE Committee on recent developments in Counter-terrorism policies (body scanners, "Detroit flight"...) European Parliament, Brussels 27 January 2010.

rough and blurred body images; concealed objects, metallic and non metallic, (particularly the larger ones) prove to be clear.

(2) **Active millimetre-wave**: Active millimetre-wave systems illuminate the body with short wavelength radio waves in the frequency ranging from approximately 30-300 GHz and form an image from the reflected radio waves. Active millimetre-wave systems produce high resolution images of both metallic and non metallic objects and reveal some surface detail of the body.

(3) **X-ray backscatter**: Backscatter systems illuminate the body with a low dose of X-rays and measure the backscattered radiation to create a two-dimensional image of the body. Backscatter systems produce high resolution images of both metallic and non metallic objects. The image reveals some surface detail of the body.

(4) **X-ray transmission imaging**: X-ray transmission imaging uses X-rays to produce images (radiographs) like a medical X-ray, penetrating clothing and the body. This technique allows detecting also metallic and non-metallic objects which have been swallowed or inserted into body cavities.

36. These four technologies have also been used for other objectives. For several years they have now also been tested in airport trials and evaluated for use in aviation security. To date, most technologies used or under consideration to be used worldwide are based on active millimetre-waves and X-ray backscatter. In particular, X-ray backscatter is the main technology deployed and operated in the US and the UK. Active millimetre-wave is being tested at Schiphol airport in the Netherlands and was demonstrated at Paris Charles De Gaulle in France; it will be rolled out also in the US in the coming months in addition to X-ray backscatter equipment. Because of high radiation doses there is no current or envisaged use of X-ray transmission scanners for aviation security screening in Europe.

37. There are several emerging technologies, all of which use passive or active non-ionising radiation, which are either still under development or have not been thoroughly tested. None of them has yet been extensively evaluated as an aviation checkpoint security system. The principal technologies in this category are:

(5) Passive and active sub millimetre-wave imaging,

(6) Passive and active terahertz imaging ,

(7) Infrared thermal imaging,

(8) Acoustic imaging.

38. All these technologies, as well as other complementary technologies, like molecule analysis to detect explosives and narcotics, may offer benefits in terms of technical and operational performance in the future but have not yet obtained market maturity. The existence and extent of their potential benefits will have to be subject to further analysis and detailed validation through performance tests done by laboratories and in operational trials at airports. As a reminder, technology using infrared radiation, indicated under numbers (6) (for active imaging), (7) and (8) must fully comply with

Directive 2006/25/EC[22]. Infrared technology performance is currently being tested in laboratories in the US.

4.3. Results of trials and other use of Security Scanners at EU airports

39. Some Member States having enrolled in trials reported[23] to the Commission that Security Scanners are a valid alternative to existing screening methods in terms of effectiveness of detecting items of different materials, improvement of the level of passenger throughput; general acceptability by passengers and increase of staff convenience. The application of operating protocols, as required by national authorisation of the airport trials, signal positive outcomes of the trials regarding health, safety and privacy.

4.4. International context

40. At present Security Scanners are being deployed at airports worldwide. The US currently deploys approximately 200 Security Scanners in 41 airports as secondary means for screening. More units will be deployed in 2010 and 2011. By 2014 the US plans to have procured and deployed 1800 Security Scanners in order to be able to gradually introduce them as a primary screening method rather than as a secondary screening method or only for alarm resolution.

41. Canada deploys 15 machines so far. A total of 44 Security Scanners is planned for deployment in 2011. Russia has been using Security Scanners at airports since 2008 and will continue to deploy them more widely in the future. The Australian Government declared in February 2010 its intention to introduce Security Scanners at airports as of next year.

42. Other states are considering deployment of Security Scanners: for example, Japan intends to introduce active and passive millimetre-wave machines. Moreover, it is expected that Security Scanners will also be deployed in Nigeria, India, South Africa, and Kenya. Further states interested in the technology are China (including Hong Kong) and South Korea.

5. KEY ISSUES

5.1. Detection performance and operating considerations

43. Detection performance is the capability of the Security Scanner to detect visually prohibited hidden objects worn on the body or in the clothing of the screened person.

44. Several organisations have elaborated testing methodologies for Security Scanners, such as the Common Testing Methodologies (CTM) developed and applied by the European Civil Aviation Conference (ECAC) (since November 2008). The US Department of Homeland Security Transportation Security Administration (TSA) and the Canadian Air Transport Security Authority (CATSA) have also developed and applied testing paradigms to evaluate operational effectiveness and detection performance.

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[22] Directive 2006/25/EC of the European Parliament and of the Council of 5 April 2006 on the minimum health and safety requirements regarding the exposure of workers to risks arising from physical agents (artificial optical radiation) (19th individual Directive within the meaning of Article 16(1) of Directive 89/391/EEC) (OJ L 114, 24.4.2006, p. 38).

[23] Finland, the Netherlands and the UK.

45. Overall tests carried out in laboratories and as part of operational trials at airports in several countries show a reliable security performance and in particular an enhanced detection probability for non-metallic items and liquids compared to walk-through metal detectors. Although questions were raised whether Security Scanners would have been able to prevent the Detroit incident of 25 December 2009, it is clear that given the technology at hand today, the Security Scanners would have maximised the probability to detect the threats and will provide us with a considerably enhanced prevention capability.

46. Such an enhanced detection performance might also be achieved by a full physical hand-search. However, hand searching is considered intrusive and is therefore disliked by both passengers and screeners. Their quality may vary, also because of high numbers of persons to be screened, in particular at larger airports under current conditions. This situation may lead to a security gap.

47. Besides increasing detection performance of non-metallic items and liquids, Security Scanners are expected to assist in keeping throughput times at screening points at an acceptable speed. Airport trials and tests suggest that Security Scanners permit a rigorous screening for a great number of passengers in a short amount of time while providing a reliable detection capability. Although scanner screening requires the person to stand still inside or next to the machine, these tests indicate that they require just about 20 seconds for producing and interpreting passenger data. It is possible that future technology may further increase speed and efficiency of Security Scanners by avoiding the need to divest jackets, boots, etc.

48. As regards the question whether or not Security Scanners should be compulsory it has to be taken into account that under the existing rules and regarding the screening methods recognised today (hand search, walk through metal detector, etc.), passengers are not offered any possibility to refuse the screening method or procedure chosen by the airport and/or the screener in charge. In order not to jeopardize high levels of aviation security, unpredictability of security processes at airports is an important consideration. This being so, individuals should only be able to influence these processes for fundamental rights or health reasons where alternative methods would offer equivalent security guarantees.

49. In addition, under certain circumstances, several airports would not dispose of the needed capacity and staff resources to provide a regular alternative to security scanners.

5.2. Protection of fundamental rights (human dignity and personal data)

5.2.1. The protection of human dignity

50. The capability of some screening technologies to reveal a detailed display of the human body (even blurred), medical conditions, such as prostheses and diapers, has been seen critically from the perspective of respect for human dignity and private life. Some persons also might face difficulties reconciling their religious beliefs with a procedure foreseeing the review of their body image by a human screener. In addition, the rights of the child and the child's entitlement to protection and care, as well as the Fundamental Rights Charter's requirement to ensure a high level of human health in all European policies and activities, require a careful analysis of related aspects for children. Moreover, as far as the right to equality and the prohibition of discrimination is concerned, operating standards must ensure that

passengers requested to undergo a security scan are not chosen based on criteria such as gender, race, colour, ethnic or social origin, religion or belief.

5.2.2. Data protection

51. The capture and processing of the image of an identified or unidentifiable person by Security Scanners in order to allow a human reviewer to perform the security relevant assessment falls under EU legislation on data protection The criteria against which the scanning has to be assessed are i) whether the measure proposed is appropriate to achieve the objective (detection of non-metallic items and therefore a higher security level), ii) whether it does not go beyond what is necessary to achieve this objective and iii) whether there is no less intrusive means.

52. Directive 95/46/EC of the European Parliament and of the Council of 24 October 1995 on the protection of individuals with regard to the processing of personal data and on the free movement of such data requires that, persons, of which images are being taken, as some Security Scanner technology does, should be informed in advance that they are subject to such an exercise and of the possible use of the image. As a rule personal data such as images should only be collected, processed and used in compliance with the applicable data protection principles. Images should only be used for aviation security purposes. In principle, storage and retrieval of images created by the Security Scanner should not be possible once a person has been cleared for not carrying any threat items. Only if an individual is stopped for carrying such an prohibited article an image may be retained as evidence until the passenger is ultimately cleared or denied access to the security restricted area and eventually the aircraft.

5.2.3. Possible ways to address the protection of human dignity, data protection and other fundamental rights concerns

53. Existing technical facilities allow blurring the face and/or parts of the body not needed for further analysis of the absence of prohibited articles. Equally, it is technically possible to produce instead of real images of the body only a mannequin or a stick figure, which does not reveal any real parts of the screened person's body, but only identifies the location for further search.

54. As regards actual operation of Security Scanners protocols[24] developed for trials, tests and actual deployment of Security Scanners show possible ways to address concerns related to the respect for fundamental rights, such as the following:

– The officer analysing the image ("the reviewer") works remotely without any possibility to see the person whose image is being analysed.

– The reviewer has no possibility to link the analysed image to any real person, by applying remote reviewing together with the use of equipment without storage facility.

– Detailed reviewing of images might be undertaken by a person of the same gender.

[24] An interim code of practice covering privacy, data protection, health and safety has been produced by the UK Department for Transport for the initial deployment of Security Scanners in London Heathrow and Manchester airports and can be consulted at the following website: http://www.dft.gov.uk/pgr/security/aviation/airport/bodyscanners/codeofpractice/

– Appropriate methods of automated communication must ensure that the exchange between the reviewer and the screener at the checkpoint is limited to the information necessary to satisfactorily search the person.

– More thorough hand searches must take place in cabins or in specially designated separate rooms.

55. If it were decided to use Security Scanners that create images on a voluntary basis, any related fundamental rights concerns would be significantly reduced. However, when considering this option, it must be clear that passengers refusing the Security Scanner need to undergo an alternative detection method of similar effectiveness, for example, full body hand searches in order to maintain high levels of aviation security.

56. Furthermore, privacy by design and Privacy Enhancing Technologies (PETs) applied to hardware and software incorporated in Security Scanners may produce information and communication systems and services minimising the collection and the processing of personal data[25]. Such systems would ensure, for example, that

– images are not stored (retained), copied, printed, retrieved or sent remotely and that unauthorised access is prevented[26],

– images that analysed by a human reviewer are not linked to the identity of the screened person and are kept 100% anonymous.

57. An additional solution to address data protection requirements and eventually phase out human analysis of images is expected to be automation of the object recognition process, generally referred to as Automatic Threat Recognition (ATR). It may either be used to assist the human screener in interpreting images or to carry out this interpretation automatically. Technologies allowing full automated threat recognition have been tested in laboratories and ready for Member States to test them at airports.

58. ATR is based on specific software, designed to recognise dangerous and forbidden objects. ATR may differ in design, complexity and performance. Some forms of ATR for screener assistance only display part of the image to the screener. Other types display the full image and highlight areas where threats may be present. Future development of ATR could mean that a human screener would no longer be required, and only the result of the automated detection process (alarm and location of object on the person / no alarm) would be shown to the security officer who will perform alarm resolution (for example by hand search). ATR systems can be installed by upgrading currently existing equipments with additional software components.

59. Whatever technology and operational safeguards chosen, the modalities for the use of Security Scanners would need to be provided for in binding rules. Member States' authorisations for individual deployment at airports should be based on a thorough assessment of a possible impact on fundamental rights and safeguards available.

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25 Communication from the Commission to the European Parliament and the Council on Promoting Data Protection by Privacy Enhancing Technologies (PETs) - COM(2007) 228.

26 In addition, trials have shown that the there is no need for images of screened persons to be kept once a person is cleared. The screener looks at the image only for as long as the passenger is standing in the machine and that there is no need for images to be captured or stored for future use such as for example as evidence in a Court case since it would be the discovery of an actual forbidden object on the person, not the discovery of an image on a machine that would be the basis for prosecuting a person.

Moreover, appropriate, comprehensive and clear information to the public on all aspects of Security Scanners use in aviation security should be also ensured.

5.3. Health

60. According to the technology used different health issues must be considered. Different legislation applies to these technologies and different dose limits have to be respected. European and international studies[27] have been carried out on the safety aspects of Security Scanners or their underlying technology, including radio wave and ionising radiation exposure of persons being screened, operators and others who work in the vicinity of the systems. Several studies investigate in a more general way the impact of these technologies on the human being. This report mainly focuses on studies looking at the impact in relation to aviation security use of Security Scanners.

5.3.1. Passive millimetre-wave imaging systems

61. This technology does not emit any radiation It measures the natural (thermal) radiation which is emitted by the body and the thermal radiation emitted by the environment and reflected by the body. These types of Security Scanners therefore do not have any radiation dose associated to them. The consulted studies do not raise health concerns when using passive millimetre wave technology.

5.3.2. Active millimetre-wave imaging systems

62. Millimetre-wave technology uses non-ionising radiation and, in current systems, millimetre radiation with a frequency of approximately 30 gigahertz (GHz). On the electromagnetic spectrum millimetre waves lie between microwaves and infrared and have a lower frequency, longer wavelength and lower energy than X-ray radiation.

63. Non-ionising radiation is generally considered not harmful compared to ionising radiation, such as X-rays. Studies on millimetre technology and the longstanding experience with this technology, for example, for mobile phones and microwave kitchen ovens, indicate that the exposure of persons to non-ionising radiation below limit values specified in current legislation has not been shown to have health implications. However, exposure to electromagnetic radiation above certain limit values may cause damage for different types of frequencies (such as for example the heat generation in body tissue).

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[27] At European level see: Note of 15.2.2010, Agence Française de Sécurité Sanitaire de l'Environnement et du Travail relative au "scanner corporel à ondes "millimétriques" ProVision 100"; The French Institute for Nuclear Radioprotection and Safety (IRSN), Evaluation du risque sanitaire des scanners corporels à rayons X « backscatter », rapport DRPH 2010-03 and Recommandations 2007 de la Commission Internationale de Protection Radiologique, ICPR 103; Health Protection Agency, Centre for Radiation, Chemical and Environmental Hazards (HPA), UK, Assessment of comparative ionising radiation doses from the use of rapiscan secure 1000 X-ray backscatter body scanner, UK January 2010 (Available at www.dft.gov.uk). For international studies see: The American Interagency Steering Committee on Radiation Standards (ISCORS), Guidance for Security Screening of Humans Utilizing Ionizing Radiation Technical report 2008-1; The National Council on Radiation Protection and Measurement (NCRP), commentary 16- Screening of Humans for Security Purposes Using Ionizing Radiation Scanning Systems (2003) and International Commission on Non-Ionizing Radiation Protection (ICNIRP), Guidelines for limiting exposure to time-varying electric, magnetic and electromagnetic fields 1998; 2010 Report by the Inter-Agency Committee on Radiation Safety on scanners.
Further reference to studies can be found in the Technical Report on "Body scanners for aviation security", Network for Detection of Explosives (NDE), 22.3.2010.

64. European legislation[28] provides for basic restrictions of the power density delivered by electromagnetic fields, for example, caused by electronic equipment, in order to prevent damage due to a local heating of skin. For frequencies between 2 and 300 GHz, the millimetre-wave Security Scanners would be using, the maximum power density level recommended for members of the public is 10 W/m2 and is 50W/m2for exposed workers.

65. According to a recent evaluation carried out by the Agence Française de Sécurité Sanitaire de l'Environnement et du Travail (AFSSET)[29] on the effect of a commercially available active millimetre-wave Security Scanner operating in the range 24-30 GHz, the measured surface power densities are very low[30] compared to the power density exposure of 10 W/m² for members of the public (and 50 W/m² for exposed workers) limit. Consequently, the AFSSET study concluded that based on the current knowledge of the effects of millimetre-waves on health, this equipment did not provide adverse risk for health in the mentioned frequency. The study also suggests that exposure levels arising from natural and everyday activities (e.g. mobile phones[31] and microwave ovens[32]) are very close to or go beyond levels of radiation used in millimetre-wave Security Scanners.

5.3.3. X-ray backscatter

66. The use of X-ray equipment is subject to the requirements of the Euratom radiation protection legislation[33], and in particular provisions on the non-medical use of ionising radiation. Under this framework the maximum exposure to ionising radiation shall not be more than 1 mSv[34] per year for members of the public and 20 mSv per year for exposed workers. National authorisations for the use of ionising equipment are issued on the basis of an evaluation of potential exposure doses and the exposure frequency in order to estimate a possible cumulative effect of ionising radiation. Air crews on certain exposed flights, for example, receive exposures of more than 1 mSv per year and are thus made subject to specific protection under European legislation.

67. The risks linked to ionising X-ray radiation have been extensively studied by European and International organisations. X-ray Security Scanners will still expose

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28 Council Recommendation of 12 July 1999, on, the limitation of exposure of the general public to electromagnetic fields (0 Hz to 300 GHz) (OJ L 199, 30.7.1999). Directive 2004/40/EC of the European Parliament and of the Council of 29 April 2004 on the minimum health and safety requirements regarding the exposure of workers to the risks arising from physical agents (electromagnetic fields) (18th individual directive within the meaning of Article 16(1) of Directive 89/391/EEC - OJ L 184, 24.5.2004).

29 Note of 15.2.2010, Agence Française de Sécurité Sanitaire de l'Environnement et du Travail relative au "scanner corporel à ondes "millimétriques" ProVision 100". The electromagnetic radiation level delivered by the millimetre wave equipment under analysis was also very low compared to those set in national law (Decree 2002-775 of 3 March 2002 on limited values for electromagnetic field exposure emitted by telecommunication equipments and radio electric installations).

30 ranging between 60 to 640 µW/m2 (1µW=1microwatt=0,000001W)

31 The radio waves used are of an equivalent to 0.01% of the permissible dosage for mobile phones.

32 The centre for Occupational Health and Safety has measured the intensity of electromagnetic waves at 2 W/m2) (watt per square meter) the leak level for domestic ovens. This value is considerably lower than the 10 W/m2 (50 W/m²) official power density exposure limit.

33 Council Directive 96/29/EURATOM of 13 May 1996 laying down basic safety standards for the protection of the health of workers and the general public against the dangers arising from ionizing radiation (OJ L 159, 29.6.1996, p. 1).

34 millisievert (1 mSv = 10−3 Sv) and microsievert (1 µSv = 10−6 Sv)

individuals to ionising radiation but the dose is low. The use of X-ray technology should nevertheless always be preceded by an assessment of the proportionality and justification of the measures being proposed. Typically a single backscatter X-ray scan of an individual will result in the person receiving a radiation dose between 0,02[35]and 0.1 µSv[36]. Radiation doses are cumulative, so an individual's total dose will depend on the number of scans. It would take around 40 screening per day to reach the dose limit, not taking into account further exposure.

68. As regards operators of Security Scanners or persons working close to the equipment, it has been estimated[37] that the dose received may be as high as 0.01 µSv per operation that is per person screened, without specific operator protection. Based on 500 screenings/day, the dose for an operator ranges between 300 µSv to 1 000 µSv per year. Overall studies indicate that the exposure from X-ray backscatter technology is estimated to be equivalent to few percent (2%) of the dose of natural ionising radiation received by passengers. It would correspond to a few minutes of exposure to cosmic radiation on a long haul flight.

5.3.4. X-ray transmission imaging

69. Generally, the radiation dose to the individuals from a transmission system technology is much higher than the dose from backscatter technology therefore it is in principle not considered for systematic screening in aviation security. This technology is in principle restricted to use by police forces in case of established suspicion.

70. The dose of equipment producing transmission images is clearly above the dose emitted by X-ray backscatter Security Scanners, typically about 0.1-5 µSv per scan depending on the system applied and the resolution required. The dose received from the use of the higher resolution transmission scanners (2-5 µSv/scan) could cause that some of the recommended annual limits be exceeded. Because of these characteristics and the availability of effective alternatives with non- or low ionising radiation the use of transmission system technology is not applied in aviation security in Europe.

5.3.5. Possible ways to address health concerns of X-ray Security Scanners

71. While the doses emitted by X-ray security scanners to screen persons are rather low, it is evident any exposure to ionising radiation, however small, may have health effects in the longer term. Therefore exposure even below the dose limits set by European legislation require that any decision on exposure to ionising radiation must be justified on grounds of their economic or public benefit to offset the potential

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35 The UK Health Protection Agency (HPA) has carried out an assessment of the ionising radiation doses for a commercially available backscatter technology scanner compared with natural and other sources of ionising radiation. The report shows that the radiation dose from a scan (0.02 µSv) is a small fraction of the average dose received by members of the public from natural and other sources. Assessment of comparative ionising radiation doses from the use of rapiscan secure 1000 X-ray backscatter body scanner, UK Health Protection Agency, Centre for Radiation, Chemical and Environmental Hazards, January 2010. Available at www.dft.gov.uk

36 The French Institute for Radioprotection and Nuclear Safety made a recent evaluation of the health risk of X-ray backscatter Security Scanner systems estimating at approximately 0.1µSv the dose for a passenger screening (2 scans). IRSN, Evaluation du risque sanitaire des scanners corporels à rayons X « backscatter », rapport DRPH 2010-03.

37 IRSN, Evaluation du risque sanitaire des scanners corporels à rayons X « backscatter », rapport DRPH 2010-03.

damage from radiation. In addition, radiation protection measures must ensure that all exposures are as low as reasonably achievable (the ALARA principle) for workers, the general public, and the population as a whole. Therefore, if and when a ionising technology is being deployed, the improved efficiency in security terms, compared to the use of a non ionising technology, must be weighed against the possible health impact and thus has to be justified through a considerable gain in security level. Special considerations might also be called for when it comes to passengers that are especially sensitive to ionising radiation, primarily pregnant women and children.

72. Under Euratom legislation (Directive 96/29/Euratom) it is Member States responsibility to make an in-depth risk assessment and to decide whether an activity exposing persons to radiation can be considered as justified or not. For example, the assessment of the radiological impact of Security Scanners using ionising technology would depend on different factors such as:

– Whether all passengers are systematically scanned, or alternatively whether passengers are selected for scanning randomly or on the basis of specific criteria.

– Whether sensitive groups for health reasons are allowed a different treatment.

73. Member States should assess each individual deployment at airports on the basis of a thorough evaluation of a possible impact on health issues and safeguards available. On the basis of such evaluation Member States could also decide to go beyond legal EU requirements.

74. All technologies compliance with health requirements would depend on the correct installation and use of equipment. This would have to be carefully monitored by national radiation regulatory authorities.

75. It has to be noted that some Member States[38] currently preclude exposure of persons to ionising radiation other than for medical purposes through national legislation.

5.4. Cost

76. Overall there are obstacles that make it difficult to undertake in a general way a cost assessment of the deployment of Security Scanners. General information related to basic investment cost for equipment and use related costs are not yet available because existing European legislation does not allow for widespread deployment of this technology. Lifetime costs of the equipment and possible cost benefits to the security policy will have to be assessed once and if, Security Scanners are commonly used in aviation security. In addition the Security Scanner market is an emerging market and only few individual purchases have been undertaken under purely commercial considerations. Moreover, the choice airports have to assemble security methods will make overall costs closely dependant on the security options individual airports will design and apply.

77. According to information received from manufacturers and based on procurements recently done inside and outside the EU the purchase cost of a basic Security Scanner per equipment ranges between EUR 100 000 and 200 000[39]. This price corresponds to the initial investment and does not include upgrading with additional software

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38 Such as for example Germany, Italy, France and the Czech Republic.

39 Unconfirmed US figures put the cost per unit at approximately of EUR 150 000), excluding training, installation, and maintenance costs.

which might be needed to address for example the privacy and data protection concerns, nor components allowing for example the automatic use of the Security Scanner equipment. Additional equipment components costs might be estimated at EUR 20 000.

78. Expected costs are supposed to decrease in the future due to higher production numbers. Depreciation for aviation security equipment is commonly done over a period of 5 to 10 years.

79. Maintenance costs and other after sale services must also be considered but will depend on individual contract arrangements.

80. In addition to this, training and other deployment costs must be envisaged: better trained staff and additional or restructured space at checkpoint areas will cause short term costs. However, airports will have to redeploy well trained staff in order to screen more accurately those persons with considerable threat potential, for example, passengers that have caused an alarm because of hiding prohibited items.

81. Estimation undertaken in the US show that current procedures for Security Scanners that are implemented to ensure passenger privacy may add to direct running costs through the use of remote human screeners[40]. The evolution towards ATR has the potential to produce a higher throughput and cost savings compared to the current procedures that rely on full hand search[41]. Indeed, it has been estimated[42] that ATR reduces by 50% processing time, thus increasing passenger throughput, lowering operating costs (staff reduced by 1/3) and training costs (training time reduced over 90%).

82. The deployment of Security Scanners could in particular allow large airport to get greater flexibility and potential to further strengthen aviation security as these airports could benefit from economies of scale and smoother deploy Security Scanners in their existing infrastructure.

6. CONCLUSIONS

83. Common EU standards for Security Scanners can ensure an equal level of protection of fundamental rights and health. A common level of protection for European citizens in this respect could be ensured by a way of technical standards and operational conditions that would have to be laid down in EU legislation. Only a EU approach would legally guarantee uniform application of security rules and standards throughout all EU airports. This is essential to ensure both the highest level of aviation security as well as the best possible protection of EU citizens' fundamental rights and health. The deployment of any security scanner technology requires a rigorous scientific assessment of the potential health risks that such technology may pose for the population. Scientific evidence documents the health risks associated with exposure to ionising radiation. It justifies particular precaution in considering the use of such radiation in Security Scanners.

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40 The US transport Security Administration calculated to three full time-equivalents the additional staff needed to operate each unit.

41 The experience at Schiphol airport predicts that a newly and faster available version of security scanners would be able to meet peak throughput demand levels in all existing checkpoint lanes.

42 US Transport Security Administration (TSA), Advanced Imaging technology, 18-19 March 2010.

84. It is evident that security scanners alone -like any other single security measure- cannot guarantee 100% aviation security. Security can be achieved only through a combination of approaches, supported by strong international cooperation and high quality intelligence. Learning from the experience of other international partners that are deploying Security Scanners technologies should feed into the European debate.

85. Nevertheless, on-going tests have shown that Security Scanners can improve the quality of security controls at EU airports. Their use could considerably increase the detection capacity especially of those prohibited items, such as liquid or plastic explosive, which cannot be detected by walk-through metal detectors.

86. Nevertheless alternatives to Security Scanners based on ionising radiation technology should be available when specific health related risks arise. Any possible future EU harmonisation in this area needs to provide for alternative security checks for vulnerable groups including pregnant women, babies, children and people with disabilities.

87. Today Security Scanner technologies exist that neither produce full body images nor emit ionising radiation. Technical standards and operational conditions to be laid down by law could significantly reduce concerns related to fundamental rights and health:

- Under existing technology and safeguards attached to the use of Security Scanner equipment, fundamental rights issues can be dealt with by a combination of technical equipment specifications and operational rules. Minimum standards could be laid down by law.
- With the exception of full X-ray transmission imaging as identified in this report, current security scanner technologies can meet existing EU health standards but certain types of equipment will require technical and operational standards to be fixed. Maximum radiation doses must be respected and precautionary safeguards established. Individual protection must ensure that exposure is as low as reasonably achievable, in particular for travellers and workers. The long-term effects of exposure to security scanners should be regularly monitored and new scientific developments taken into account.
- The travelling public must receive clear and comprehensive information at airports and before travelling on all aspects linked to the use of Security Scanners.
- The Commission nevertheless takes note of the ongoing discussion and further possibility for opt-outs, should security scanners be deployed. At the same time, it takes note of the fact that such opt-outs raise issues in relation to security, cost and feasibility that could put the usefulness of a possible deployment in question.

88. The Commission invites the European Parliament and the Council to examine the present report, submitted in response to European Parliament Resolution No (2008)0521. Stakeholders will be asked to give their opinion at a second meeting of the Task Force shortly.

89. The Commission will decide on the next steps to take, including whether or not to propose an EU legal framework on the use of Security Scanners at EU airports and the conditions to be included in such a framework to ensure full respect of fundamental rights and to address health concerns. This will be done, in the light of the outcome of the discussion with the European Parliament and the Council. As any legislative proposal would have to be accompanied by an impact assessment, the

Commission would immediately start working on such an impact assessment to address the issues raised in this Report.