~~SENSITIVE SECURITY INFORMATION~~

TSA Record of Environmental Consideration

REC NO. 07TSAOSHE002
May 13, 2008

PROJECT TITLE: MILLIMETER-WAVE PASSENGER SCREENING TECHNOLOGY
PROJECT DATE: Ongoing

SUMMARY:

The Transportation Security Administration (TSA) is evaluating a non-intrusive personnel security screening technology for potential aviation and mass transit applications that may eventually replace inspections by metal detection hand-wands and physical pat-downs.

The millimeter-wave technology is a type of imaging technology that scans passengers for natural radiation emitted by the human body (**passive imaging**) or exposes passengers to a specific type of radiation reflected by the body (**active imaging**). (b)(3), 49 USC 114(r) (b)(3), 49 USC 114(r) When these threat items are concealed on the body, they can be distinguished from the background image of the body. The system generates a three-dimensional image of the body that is displayed on a remote monitor for analysis.

If the evaluation is successful, the system will be deployed nationwide.

PROJECT DESCRIPTION:

Active Millimeter-Wave Imaging. In July 2007, TSA awarded contracts to three different vendors to lease their active passenger imaging technologies to TSA for testing in airports for up to six months. TSA evaluated the active millimeter-wave technology at Phoenix International Airport beginning in November 2007 and is currently deploying additional active millimeter-wave systems. Throughout the pilot, TSA will examine operational impact, equipment effectiveness, training, safety of use, and perceptions by the traveling public. TSA plans to test the technology further at other airport sites. The active millimeter-wave technology is currently utilized in various government locations across the United States, to include use by the Department of Defense, as well as international aviation and mass transit environments. The active millimeter-wave technology was developed by the U.S. Department of Energy's Pacific Northwest National Laboratory (PNNL) under contract to the Federal Aviation Administration. Active millimeter-wave technology is a process in which beams of radio frequency (RF) energy are projected over the body's surface at high speed from two antennas simultaneously as they rotate around the body. The RF energy reflected back from the body or other objects on the body are used to construct a three-dimensional image. Since the power levels are low and the radiation only penetrates to skin depth, no adverse health affects occur.[1] The active millimeter-wave takes only a few moments to screen each passenger for weapons and explosives. Because the technology produces images that may create privacy issues with the traveling public, TSA is taking special precautions to minimize privacy-related concerns.

Passive Millimeter-Wave Imaging. TSA is currently evaluating the passive millimeter-wave technology for use in passenger ferry, passenger rail, and mass transit environments. The overall TSA program goals for passive millimeter-wave systems are to evaluate the technology and products, qualify systems for use, and to conduct an incremental procurement over the next fiscal years. TSA performed a field experiment

[1] National Research Council of the National Academies. 2007. Committee on Assessment of Security Technologies for Transportation. Assessment of Millimeter-Wave and Terahertz Technology for Detection and Identification of Concealed Explosives and Weapons.

of the SPO-20 passive millimeter-wave system manufactured by QinetiQ at the New York City Pier 90 and Staten Island Ferry March-April 2007 (maritime environment) and at Union Station, Washington, D.C July 2007 (passenger rail/mass transit environment). The passive millimeter-wave technology is based upon the principle that any object not at absolute zero temperature emits electromagnetic energy at all wavelengths. This energy can be detected by a receiver and in turn produce an image. Passive imaging systems require that there be an apparent temperature difference, either positive or negative, between the body and its surroundings. An important feature of this technology is its ability to accomplish this imaging by gathering the radiation emitted naturally from the human body without artificial radiation. Because the system is completely passive, and does not emit anything, no health or environmental risks are associated with this technology.[2] Passive millimeter-wave systems do not create any undue privacy issues with the traveling public because they either use CCTV images or colorimetric and gradient displays which do not display any bodily details.

ENVIRONMENTAL REVIEW:

Activities associated with the project have been reviewed for significant impacts to the environment. Note the following potential environmental sensitivities related to this project.

Hazardous Materials/Wastes:
The millimeter-wave technology does not use hazardous materials during operation, but may contain shielding and electronic components, which would require proper handling during disposal. Disposal of equipment is covered under the Office of Security Technology (OST) Security Technology Disposal Plan, which is consistent with the Federal Management Regulations (41 CFR 102) and the Resource Conservation and Recovery Act (RCRA).

Air Quality:
No air emissions are expected from the millimeter-wave passenger imaging technology.

Radiation:
The **active** millimeter-wave uses non-ionizing radio frequency energy in the millimeter wave spectrum to generate an image based on the energy reflected back from the body. The system shall satisfy all requirements of ANSI/IEEE.1:2005, Standard for Safety levels with Respect to Human Exposure to RF Electromagnetic Fields, 3 kHZ to 300 GHz . The energy projected by the **active** millimeter-wave system is a minimum of 10,000 times less than a cell phone transmission. Both the active and passive millimeter-wave systems contain no ionizing radiation producing components or sources and do not pose a health risk to pregnant women, children, or infants. In addition, individuals have the option to undergo a pat-down in lieu of the active millimeter-wave screening.

Historical Area Concerns:
The equipment will be fielded within airport terminals; ferry terminals; railway and mass transit stations; and other locations with a small footprint. No historic properties are expected to be affected.

Noise:
The millimeter-wave will not cause significant additional noise apart from the existing screening checkpoint operations.

[2] National Research Council. 1996. Committee on Commercial Aviation Security. Airline Passenger Security Screening, New Technologies and Implementation Issues.

Privacy Concerns:
This project will conform to 4th Amendment requirements described in NRC Publication NMAB-482-1. The information gathered by the passenger screening device should be fundamentally limited to only that of detecting and locating concealed objects that represent potential threat articles.

- The **active** millimeter-wave passenger image has a modesty filter embedded to blur features and shows concealed items including weapons, plastics, ceramics and explosives as anomalies. The Transportation Security Officer (TSO) attending the passenger cannot view the image, and as an additional precaution, the officer viewing the image will be remotely located. The image cannot be stored, transmitted, or printed. Finally, passengers must voluntarily accept millimeter-wave scanning (instead of the alternative pat-down search).
- The **passive** millimeter-wave system does not display details of the body.

ENVIRONMENTAL COMMITMENTS:

Disposal of the equipment shall be conducted in accordance with all Federal, state, and local environmental requirements.

ENVIRONMENTAL REVIEW SUMMARY:

Activities associated with the project have been reviewed in accordance with DHS Management Directive (MD) 5100.1, *Environmental Planning Program.* Analysis has determined that the proposed activities of This project, *MILLIMETER-WAVE PASSENGER IMAGING TECHNOLOGY,* fall within the scope of the following categorical exclusion (CATEX), will not result in significant impacts to the environment, and have no special circumstances that would require an Environmental Assessment or Environmental Impact Statement.

> CATEX B8 – Acquisition, installation, maintenance, operation, or evaluation of security equipment to screen for or detect dangerous or illegal individuals or materials at existing facilities and the eventual removal and disposal of that equipment in compliance with applicable requirement to protect the environment.

The project planner is responsible for:

- Notifying the TSA Environmental Planning Program Manager (EPPM) if changes occur to the project to verify that there has been no change to the environmental impact.
- Implementing any environmental commitments identified in this REC during the execution of the planned operation.

Project Planner: (b) (6)

Date: May 20, 2008

TSA Environmental Planning Program Manager (EPPM): (b) (6)

(b) (6)

Date: 5/20/08

Director, Office of Safety and Environmental Programs (DHS DOSEP): (b) (6) 5/22/08

Date:
2400.11.3

TSA Record of Environmental Consideration

REC NO. 07TSAOSHE003
May 13, 2008

PROJECT TITLE: BACKSCATTER PASSENGER SCREENING TECHNOLOGY
PROJECT DATE: Ongoing

SUMMARY:

The Transportation Security Administration (TSA) is evaluating non-intrusive personnel security screening technology for potential aviation and mass transit applications. The technology provides imaging capability to inspect a passenger for concealed weapons (metal and non-metal) and some explosives in place of a metal detection wand inspection and physical pat-down. **Backscatter** technology relies on the x-ray radiation that is [redacted] where it is converted into a computer image of the subject and displayed on a remote monitor.

If the evaluation is successful, the system will be deployed nationwide.

PROJECT DESCRIPTION:

Backscatter imagers show images by directing a sweeping beam of X-rays at the object under examination, and then measuring and plotting the intensity of scattered X-rays as a function of the beam position. Akin to light reflection, backscatter signals interact with inorganic objects, explosives, plastics, and other biological items. The intent of the Backscatter Passenger Screening Technology is to identify weapons and other items concealed anywhere on the surface of the body. This new technology enables TSA to screen simultaneously and more thoroughly for weapons and explosives. The backscatter technology produces images that may create privacy issues with the traveling public. TSA intends to use privacy masking on displays, as well as other means, to minimize privacy concerns.

In July 2007, TSA awarded contracts to three different vendors to lease their passenger imaging machines to TSA for testing in airports for up to six months. TSA will evaluate the backscatter technology and the millimeter wave technology, using the same airport and location. Through the pilot, TSA will examine operational impact, equipment effectiveness, training, safety of use and perceptions by the traveling public. In November 2007, TSA began a pilot program to evaluate passenger-imaging technology at Phoenix Sky Harbor Airport (PHX). TSA used backscatter equipment and passengers participated on a voluntary basis. With the privacy algorithm, approximately 79 percent of passengers chose the backscatter body scan over the traditional pat-down procedure.

TSA plans to test these technologies further at John F. Kennedy Airport in New York and Los Angeles International Airport in California.

ENVIRONMENTAL REVIEW:

Activities associated with the project have been reviewed for significant impacts to the environment. Note the following potential environmental sensitivities related to this project.

Hazardous Materials/Waste:
The backscatter x-ray technology does not use hazardous materials during operation, but does contain lead shielding and electronic components, which would require proper handling during disposal. Disposal of equipment is covered under the Office of Security Technology (OST) Security Technology

Disposal Plan, which is consistent with the Federal Management Regulations (41 CFR 102) and the Resource Conservation and Recovery Act (RCRA).

Air Quality:
No air emissions are expected from the backscatter x-ray technology.

Radiation:
The radiation levels are within acceptable federal limits. The backscatter does not contain radioactive sources that would require a NRC license. The backscatter shall satisfy all requirements in the following documents as applicable for subject passengers, operators and incidental passengers:

- ANSI/HPS N43.17-2002 American National Standard Institute – "Radiation Safety for Personnel Security Screening Systems Using X-rays"
- OSHA Standard, 29 CFR 1910.1096, Ionizing Radiation
- "Guidelines For Limiting Exposure To Time-Varying Electric, Magnetic, And Electromagnetic Fields (Up To 300 GHz)", International Commission on Non-Ionizing Radiation Protection, Health Phys. 1998 April, Vol.74, No.4, 494-522
- ACGIH-0302 (1996), Sub-Radio Frequency (30 kHz and below) Magnetic Fields

Historical Area Concerns:
The equipment will be fielded within existing airport locations with a small 1.5 x 1.5 m footprint; no historic properties are expected to be affected.

Noise:
Backscatter shall have an impulse peak not greater than 70 dB(A) at the passenger's ear. The goal is 60 dB(A). The backscatter will not cause significant additional noise apart from the existing baggage screening or metal detector operations.

Privacy Concerns:
This project will conform to 4th Amendment requirements described in NRC Publication NMAB-482-1. The information gathered by the passenger screening device should be fundamentally limited to only that of detecting and locating concealed objects that represent potential threat articles. The Backscatter uses an edge detection algorithm to obscure physical details of passengers while still highlighting threats. The Transportation Security Officer (TSO) attending the passenger cannot view the image, and as an additional precaution, the officer viewing the image will be remotely located. The image cannot be stored, transmitted or printed. Finally, passengers will participate in the pilot voluntarily (instead of the alternative pat-down search).

ENVIRONMENTAL COMMITMENTS:

Disposal of the equipment shall be conducted in accordance with all Federal, state, and local environmental requirements.

ENVIRONMENTAL REVIEW SUMMARY:

Activities associated with the project have been reviewed in accordance with DHS Management Directive (MD) 5100.1, *Environmental Planning Program.* Analysis has determined that the proposed activities of this project, *BACKSCATTER PASSENGER SCREENING TECHNOLOGY,* fall within the scope of the following categorical exclusion (CATEX), will not result in significant impacts to the environment, and have no special circumstances, which would require an Environmental Assessment or Environmental

Impact Statement

CATEX B8 – Acquisition, installation, maintenance, operation, or evaluation of security equipment to screen for or detect dangerous or illegal individuals or materials at existing facilities and the eventual removal and disposal of that equipment in compliance with applicable requirement to protect the environment.

The project planner is responsible for:

- Notifying the TSA Environmental Planning Program Manager (EPPM) if changes occur to the project to verify that there has been no change to the environmental impact.
- Implementing environmental commitments identified in this REC during the execution of the planned operation.

Project Planner: (b) (6) [redacted]

Date: May 20, 2008

TSA Environmental Planning Program Manager (EPPM):

(b) (6) [redacted] for (b) (6) [redacted]

Date: 5/20/08

Director, Office of Safety and Environmental Programs (DHS DOSEP):

(b) (6) [redacted]

Date: 5/22/08

2400.11.3