



Transportation
Security
Administration

May 31, 2012

Mr. Leopoldo R. Vasquez Jr.
Federal Security Director
Transportation Security Administration
Corpus Christi International Airport (CRP)

Dear Mr. Vasquez:

The TSA Occupational Safety, Health, and Environment (OSHE) Division is sponsoring an independent radiation protection survey project of general-use backscatter x-ray advanced imaging technology (AIT) systems and cabinet x-ray systems through an interagency agreement with the U.S. Army Public Health Command (USAPHC). This survey project is not to be confused with the radiation surveys performed during preventive maintenance service. The preventive maintenance radiation surveys are conducted at least annually by certified equipment maintenance personnel under specific testing conditions, whereas the survey project is conducted by USAPHC personnel under normal operating conditions; e.g., baggage flow-through or passenger screening with TSOs in attendance.

As part of the survey project, a radiation protection survey of the general-use backscatter x-ray AIT and cabinet x-ray systems used at TSA CRP was conducted on March 10, 2012, by a team of certified health physicists from USAPHC's Health Physics Program, Army Institute of Public Health. The purpose of the survey was to ensure that the general-use backscatter x-ray AIT systems comply with the requirements of ANSI/HPS N43.17-2009, that the cabinet x-ray systems comply with the Food and Drug Administration's Performance Standards for Ionizing Radiation Emitting Products under Title 21, CFR, Subchapter J (21 CFR 1020.40 Cabinet x-ray systems), and to identify any health hazards associated with the use of either of these x-ray systems.

General-use Backscatter X-ray AIT System

One general-use backscatter x-ray AIT system was surveyed and found to be in compliance with the radiation dose limits specified in ANSI/HPS N43.17-2009. There are no health hazards associated with the use of this general-use backscatter x-ray AIT system provided appropriate operating procedures are followed. In addition, the general-use backscatter x-ray AIT system was in compliance with other (non-emission) requirements of ANSI/HPS N43.17-2009. See page 2 of the attached report and the applicable survey worksheet (Enclosure 1 of attached report).

Cabinet X-ray Systems

The results for the surveyed cabinet x-ray systems are described on page 2 of the attached report and in the survey worksheets (Enclosure 2 of the attached report), and are summarized as follows:

A total of four cabinet x-ray systems were surveyed and found to be in compliance with the emissions limit specified in Title 21, CFR, Subchapter J, Section 1020.40. There are no health hazards associated with the use of these cabinet x-ray systems provided appropriate operating procedures are followed. In addition, the cabinet x-ray systems complied with other (non-emission) requirements of Title 21, CFR, Subchapter J, Section 1020.40.

One administrative item was found for the Reveal CT-80 cabinet x-ray system at the United/Continental baggage area, namely that the date of the service provider's survey was not posted on the system. For more information, see page 2 of the attached report as well as page 2 of the final survey notes in Enclosure 3.

Your early attention to correcting the identified administrative finding is requested. Please contact the TSA Service Response Center at 1-800-820-8535 for assistance, and advise me of progress via email by June 30, 2012, or when the correction is completed, whichever is sooner.

If you have questions or comments about the report's contents, please direct them to me at [REDACTED]

Sincerely,



Jill M. Segraves, CSP

Director

Occupational Safety, Health, and Environment Division

cc: Ms. Audrey Warren, Deputy Federal Security Director / Designated Occupational Safety and Health Official (SAT)
Mr. Ed Loya, Assistant Federal Security Director – Generalist (HRL)
Ms. Christine Halfacre, Chief of Staff, Office of Security Technology

Enclosure: TSA CRP Radiation Protection Survey Report, dated 15 May 2012



DEPARTMENT OF THE ARMY
US ARMY INSTITUTE OF PUBLIC HEALTH
5158 BLACKHAWK ROAD
ABERDEEN PROVING GROUND MD 21010-5403

15 MAY 2012

Health Physics Program

Ms. Jill Segraves
Transportation Security Administration
TSA-17 OSHE
601 South 12th Street
Arlington, Virginia 20598-6017

Dear Ms. Segraves:

This letter is in reference to the Memorandum of Agreement between the U.S. Army Medical Command and the Transportation Security Administration (TSA), signed September 10, 2008; electronic mail message, subject: 2400.2.1 SAT/BRO/HRL/LRD/MFE/CRP Radiation Survey Visit, 16 February 2012; American National Standards Institute/Health Physics Society (ANSI/HPS) N43.17-2009; and Title 21, Code of Federal Regulations (CFR), Subchapter J.

A radiation protection survey was performed on 10 March 2012 at Corpus Christi International Airport (CRP), Corpus Christi, TX, Project No. 26-MF-0FYM-12. The survey was performed to:

- a. Evaluate the advanced imaging technology (AIT) x-ray system to ensure compliance with the requirements of ANSI/HPS N43.17-2009.
- b. Evaluate selected cabinet x-ray systems to ensure compliance with the requirements of Title 21, CFR, Subchapter J.
- c. Identify any health hazards associated with the use of these x-ray systems.
- d. Provide recommendations to assist in correcting any areas of regulatory noncompliance or health hazards.

The survey was performed by [REDACTED] Certified Health Physicist (CHP), Health Physics Program, Army Institute of Public Health (AIPH) and [REDACTED] CHP, Consolidated Safety Services. A total of one AIT x-ray system was evaluated for compliance with the requirements of ANSI/HPS N43.17-2009 and four cabinet x-ray systems were evaluated for compliance with the requirements of Title 21, CFR, Subchapter J. The survey results for the AIT system are provided in Enclosure 1. The survey results for each cabinet x-ray system are provided in Enclosure 2.

The AIT x-ray system tested was found to be in compliance with the radiation dose limits specified in ANSI/HPS N43.17-2009. All cabinet x-ray systems tested were found to be in compliance with the emissions limit specified in Title 21, CFR, Subchapter J. There are no health hazards associated with the use of these systems provided appropriate operating procedures are followed.

The AIT system surveyed was found to be in compliance with the other requirements of ANSI/HPS N43.17-2009.

All cabinet x-ray systems were found to be in compliance with the other requirements of Title 21, CFR, Subchapter J.

In addition, the survey officers noted the following administrative item during the surveys: Reveal CT-80, Serial No. 040254, Checked Baggage, United/Continental: The date of the service provider's survey was not posted on the system nor was a copy of the service provider's survey available at the time of the visit. However, a copy of the service provider's most recent survey form was later obtained and indicated the system had been surveyed on August 9, 2011.

Based on dosimetry and field measurements around the Secure 1000 SP and cabinet x-ray systems, it is estimated that Transportation Security Officers will receive a radiation dose of less than 10 millirem per year. For comparison, the occupational limit under Occupational Safety and Health Administration regulations is 1,250 millirem per quarter (5,000 millirem per year). The goal of the TSA radiation safety program is to keep all exposure less than 100 millirem per year.

The survey officers discussed the survey results with Mr. Ed Loya, Assistant Federal Security Director on March 10, 2012. Draft survey notes were provided via electronic mail on 10 March 2012. A copy of the final survey notes is provided in Enclosure 3.

For more information concerning the survey, please contact the AIPH, Health Physics Program, at [REDACTED]

Sincerely,

[REDACTED]

Portfolio Director
Occupational Health Sciences

3 Enclosures

Survey Results for One AIT X-Ray System

Survey Worksheet - AIT X-Ray Systems

Health Physics Program

U.S. Army Public Health Command

Aberdeen Proving Ground, Maryland 21010-5403

SURVEY DATA					SURVEY LOCATION				
Project No.		26-MF-0FYM-12			Location		Checkpoint		
Survey Date		10 Mar 2012			Organization		Corpus Christi International Airport		
Surveyor(s)		[REDACTED]			Street Address		1000 International Drive		
					City/Installation		Corpus Christi	State	TX
INSTRUMENTS USED					SYSTEM INFORMATION				
	Manufacturer	Model	Serial No.	Cal. Due	Manufacturer	Model	Serial No.	Manuf. Date	
Instrument #1	Radcal	9010	90-3378	30 Sep 2012	Rapiscan	Secure 1000 SP	S51009002	Mar 2010	
Instrument #2	Radcal	10X5-1800	17959	30 Sep 2012	Certified	NA	Place of Manufacture	Torrance, CA	
Instrument #3	Ludlum	3	286054	27 Sep 2012	Service Provider Survey Date		21 Nov 2011		

VISUAL INSPECTION										
Y	N	Requirement				Y	N	Requirement		
X		Key activated control with key capture? (ANSI N43.17-2009, paragraph 7.2.1.e)				X		At least one lighted scan in progress indicator visible from the inspection zone? (ANSI N43.17-2009, paragraph 7.2.1.b)		
X		"Caution: X-Rays Produced When Energized" label present at control to initiate scan? (ANSI N43.17-2009, paragraph 7.2.2.d)				X		X-ray emission terminates after a preset time or exposure? (ANSI N43.17-2009, paragraph 7.2.2.e)		
X		Technique factors preset for each mode of operation? (ANSI N43.17-2009, paragraph 7.2.2.b)				X		Operators have a clear view of the scanning area? (ANSI N43.17-2009, paragraph 7.2.1.f)		
X		Means to initiate emission of radiation other than an interlock or main power control? (ANSI N43.17-2009, paragraph 7.2.1.d)				X		Tool or key required to open or remove access panels? (ANSI N43.17-2009, paragraph 7.2.1.i)		
X		Means to terminate emission of radiation other than an interlock? (ANSI N43.17-2009, paragraph 7.2.1.e)				X		User provided with required information? (ANSI N43.17-2009, paragraph 7.5)		
X		Scan in progress indicator visible for any location from which a scan can be initiated? (ANSI N43.17-2009, paragraph 7.2.1.a)				NT=not tested; NA=not applicable.				

SURVEY DIAGRAM		SCANNING MEASUREMENTS					
		Scanning below action levels? Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> (If no, explain in comments)					
		Inspection zone boundary scanned with Instrument #3.					
SCATTERED RADIATION (Optional)							
Location	Scan 1	Scan 2	Scan 3	Average			
#1	0.00 μR	0.00 μR	0.00 μR	0.00 μR	0.00 μR	0.00 μR	0.00 μR
#2	0.00 μR	0.00 μR	0.00 μR	0.00 μR	0.00 μR	0.00 μR	0.00 μR
#3	0.00 μR	0.00 μR	0.00 μR	0.00 μR	0.00 μR	0.00 μR	0.00 μR
#4	0.00 μR	0.00 μR	0.00 μR	0.00 μR	0.00 μR	0.00 μR	0.00 μR
#5	0.00 μR		#6	0.00 μR			
Measurements made with Instruments #1 & #2							

DOSE PER SCREENING				BEAM QUALITY			
		<i>Exposure (X)</i>				<i>Exposure (X)</i>	
Trial	"Front" Side	"Back" Side	Reference Effective Dose per Screening (max 25 μrem):		mm Al	"Front" Side	"Back" Side
a	6.51 μR	6.06 μR	2.0 μrem or 0.020 μSv		0	2.13 μR	1.88 μR
b	6.31 μR	6.13 μR			0	2.26 μR	1.82 μR
c	6.51 μR	6.06 μR			1	1.10 μR	0.97 μR
d	6.50 μR	6.07 μR			1	1.16 μR	0.98 μR
e	6.51 μR	6.07 μR			1.5	0.84 μR	0.85 μR
AVG	6.47 μR	6.08 μR	1.5	0.84 μR	0.78 μR	HVL "Front" Side 1.0 mm Al HVL "Back" Side 1.1 mm Al Conversion Factor 0.126 Min. Filtration ¹ 1.0 mm Al <small>¹ An HVL of 1 mm Al corresponds to a filtration of 1 mm Al for this system</small>	
Energy Correction Factor		1.25		RESULT PASS		RESULT PASS	
Measurements made with Instruments #1 & #2				Measurements made with Instruments #1 & #2			

COMMENTS AND RECOMMENDATIONS																			
Additional Instruments Used: <table border="1" style="width: 100%; border-collapse: collapse; margin-top: 5px;"> <thead> <tr> <th></th> <th>Manufacturer</th> <th>Model</th> <th>Serial No.</th> <th>Cal. Due</th> </tr> </thead> <tbody> <tr> <td>Instrument #4</td> <td></td> <td></td> <td></td> <td></td> </tr> <tr> <td>Instrument #5</td> <td></td> <td></td> <td></td> <td></td> </tr> </tbody> </table>						Manufacturer	Model	Serial No.	Cal. Due	Instrument #4					Instrument #5				
	Manufacturer	Model	Serial No.	Cal. Due															
Instrument #4																			
Instrument #5																			

Survey Results for Four Cabinet X-Ray Systems

Survey Worksheet - Cabinet X-Ray Systems

Health Physics Program
U.S. Army Public Health Command

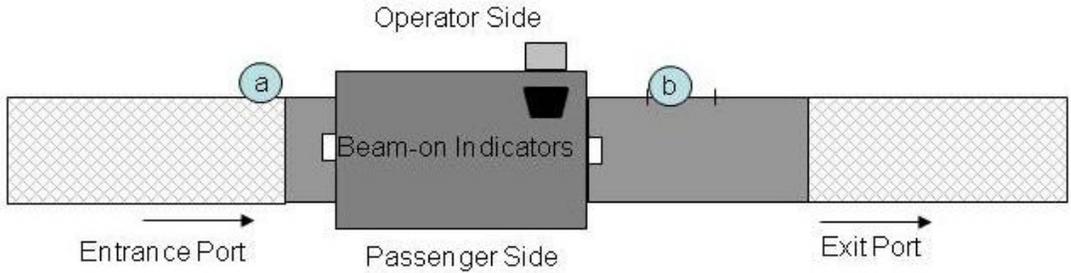
Aberdeen Proving Ground, Maryland 21010-5403

SURVEY DATA				SURVEY LOCATION			
Project No.	26-MF-0FYM-12			Location	Checkpoint, Lane 1		
Survey Date	10 Mar 2012			Organization	Corpus Christi International Airport		
Surveyor(s)	[REDACTED]			Street Address	1000 International Drive		
				City/Installation	Corpus Christi	State	TX ZIP 78406

INSTRUMENTS USED				SYSTEM INFORMATION				
	Manufacturer	Model	Serial No.	Cal. Due	Manufacturer	Model	Serial No.	Manuf. Date
Instrument #1	Radcal	9010	90-3378	30 Sep 2012	Rapsican	520B	7023805	unreadable
Instrument #2	Radcal	10X5-180	17959	30 Sep 2012	Certified	Yes <input checked="" type="checkbox"/> No <input type="checkbox"/>	Place of Manufacture	Hawthorne, CA
Instrument #3	Radcal	10X5-180	22359	30 Sep 2012	Type	Checkpoint <input checked="" type="checkbox"/>	EDS: In-line <input type="checkbox"/>	Stand-Alone <input type="checkbox"/>
Instrument #4	Ludlum	3	286054	27 Sep 2012	Manufacturer Survey Date	2 Feb 2012		

Y		N		Requirement		Y		N		Requirement		
<input checked="" type="checkbox"/>				Warning label "Caution: X-Rays Produced When Energized" present at control panel? (21 CFR 1020.40(c)(8)(i))				<input checked="" type="checkbox"/>		Means to initiate and terminate x-ray generation? (21 CFR 1020.40(c)(6)(ii); 1020.40(c)(10)(i) or (ii))		
<input checked="" type="checkbox"/>				Warning label "Caution: Do Not Insert Any Part of the Body When System Is Energized - X-Ray Hazard" present at each port? (21 CFR 1020.40(c)(8)(ii))				<input checked="" type="checkbox"/>		Leaded drapes in good condition?		
<input checked="" type="checkbox"/>				Two independent "x-ray on" indicators visible from control panel? (21 CFR 1020.40(c)(6)(iii))				<input checked="" type="checkbox"/>		Interlocks not bypassed?		
<input checked="" type="checkbox"/>				One "x-ray on" indicator visible from each port and access panel? (21 CFR 1020.40(c)(6)(iv))				<input checked="" type="checkbox"/>		Current User's Manual available? (21 CFR 1020.40(c)(9))		
<input checked="" type="checkbox"/>				Key Activated Control present? (21 CFR 1020.40(c)(6)(i))				<input checked="" type="checkbox"/>		Maintenance performed according to recommended schedule? (21 CFR 1020.40(c)(9))		
<input checked="" type="checkbox"/>				Means to require operator presence at control panel? (21 CFR 1020.40(c)(10))						NT=not tested; NA=not applicable.		

SURVEY DIAGRAM



Accessible exterior surfaces of cabinet scanned with Instrument #4. All scanning results below action levels? Yes No (If no, explain below)

DOSE TO BAGGAGE				EXPOSURE OUTSIDE CABINET				
Trial	Exposure (X _i)			Ambient Background	0.00 μR			
1	0.1929 mR			Location	Exposure	Time	Exposure in 1 hr	RESULT
2	0.1978 mR			a	0.00 μR	5.0 min	0.000 mR	PASS
3	0.2024 mR			b	0.00 μR	5.0 min	0.000 mR	PASS
4	0.2031 mR			c	μR	min	mR	
5	0.2014 mR			d	μR	min	mR	
				e	μR	min	mR	

X_{avg} = 0.20 mR

CV = 0.0212

Coefficient of Variation (CV):

$$CV = (1/X_{avg})(\sum(X_i - X_{avg})^2/(n-1))^{1/2}$$

COMMENTS AND RECOMMENDATIONS

Dose to baggage measured with instrument #1/#2 combination.
Exposure outside cabinet measured with instrument #1/#2 combination.

Survey Worksheet - Cabinet X-Ray Systems

Health Physics Program
U.S. Army Public Health Command

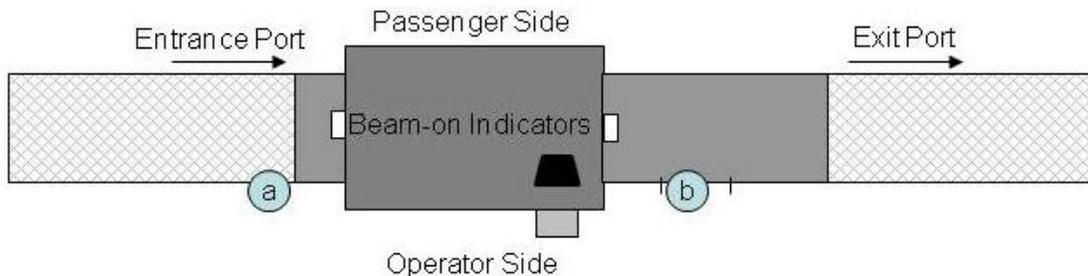
Aberdeen Proving Ground, Maryland 21010-5403

SURVEY DATA				SURVEY LOCATION			
Project No.	26-MF-0FYM-12			Location	Checkpoint, Lane 2		
Survey Date	10 Mar 2012			Organization	Corpus Christi International Airport		
Surveyor(s)	[REDACTED]			Street Address	1000 International Drive		
				City/Installation	Corpus Christi	State	TX

INSTRUMENTS USED				SYSTEM INFORMATION				
	Manufacturer	Model	Serial No.	Cal. Due	Manufacturer	Model	Serial No.	Manuf. Date
Instrument #1	Radcal	9010	90-3378	30 Sep 2012	Rapsican	520B	7065203	Dec 2006
Instrument #2	Radcal	10X5-1800	17959	30 Sep 2012	Certified	Yes <input checked="" type="checkbox"/> No <input type="checkbox"/>	Place of Manufacture	Hawthorne, CA
Instrument #3	Radcal	10X5-180	22359	30 Sep 2012	Type	Checkpoint <input checked="" type="checkbox"/>	EDS: In-line <input type="checkbox"/>	Stand-Alone <input type="checkbox"/>
Instrument #4	Ludlum	3	286054	27 Sep 2012	Manufacturer Survey Date	5 Jan 2012		

Y		N		Requirement		Y		N		Requirement	
<input checked="" type="checkbox"/>				Warning label "Caution: X-Rays Produced When Energized" present at control panel? (21 CFR 1020.40(c)(8)(i))				<input checked="" type="checkbox"/>		Means to initiate and terminate x-ray generation? (21 CFR 1020.40(c)(6)(ii); 1020.40(c)(10)(i) or (ii))	
<input checked="" type="checkbox"/>				Warning label "Caution: Do Not Insert Any Part of the Body When System Is Energized - X-Ray Hazard" present at each port? (21 CFR 1020.40(c)(8)(ii))				<input checked="" type="checkbox"/>		Leaded drapes in good condition?	
<input checked="" type="checkbox"/>				Two independent "x-ray on" indicators visible from control panel? (21 CFR 1020.40(c)(6)(iii))				<input checked="" type="checkbox"/>		Interlocks not bypassed?	
<input checked="" type="checkbox"/>				One "x-ray on" indicator visible from each port and access panel? (21 CFR 1020.40(c)(6)(iv))				<input checked="" type="checkbox"/>		Current User's Manual available? (21 CFR 1020.40(c)(9))	
<input checked="" type="checkbox"/>				Key Activated Control present? (21 CFR 1020.40(c)(6)(i))				<input checked="" type="checkbox"/>		Maintenance performed according to recommended schedule? (21 CFR 1020.40(c)(9))	
<input checked="" type="checkbox"/>				Means to require operator presence at control panel? (21 CFR 1020.40(c)(10))						NT=not tested; NA=not applicable.	

SURVEY DIAGRAM



Accessible exterior surfaces of cabinet scanned with Instrument #4. All scanning results below action levels? Yes No (If no, explain below)

DOSE TO BAGGAGE				EXPOSURE OUTSIDE CABINET							
Trial	Exposure (X_i)			Ambient Background		0.00 μR					
1	0.2905 mR	<table border="1" style="margin: auto;"> <tr> <td>X_{avg}</td> <td>0.29 mR</td> </tr> <tr> <td>CV</td> <td>0.0043</td> </tr> </table> <p>Coefficient of Variation (CV): CV = (1/X_{avg})(Σ(X_i - X_{avg})²/(n-1))^{1/2}</p>	X _{avg}	0.29 mR	CV	0.0043	Location	Exposure	Time	Exposure in 1 hr	RESULT
X _{avg}	0.29 mR										
CV	0.0043										
2	0.2900 mR		a	3.03 μR	5.0 min	0.036 mR	PASS				
3	0.2931 mR		b	2.07 μR	5.0 min	0.025 mR	PASS				
4	0.2917 mR	c	μR	min	mR						
5	0.2905 mR	d	μR	min	mR						
		e	μR	min	mR						

COMMENTS AND RECOMMENDATIONS

Dose to baggage measured with instrument #1/#2 combination.
Exposure outside cabinet measured with instrument #1/#2 combination.

Survey Worksheet - Cabinet X-Ray Systems

Health Physics Program

U.S. Army Public Health Command

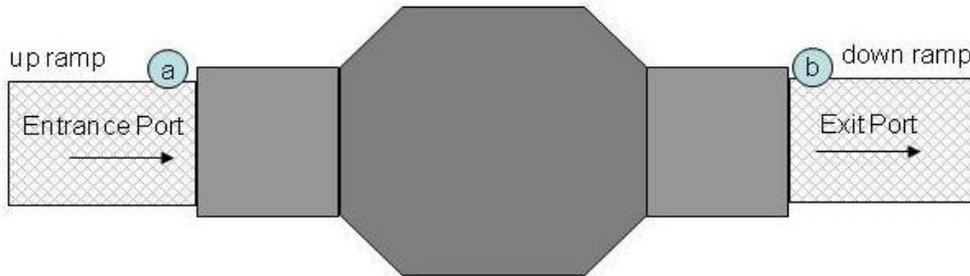
Aberdeen Proving Ground, Maryland 21010-5403

SURVEY DATA					SURVEY LOCATION					
Project No.	26-MF-OFYM-12				Location	Southwest CT-80				
Survey Date	10 Mar 2012				Organization	Corpus Christi International Airport				
Surveyor(s)	[REDACTED]				Street Address	1000 International Drive				
					City/Installation	Corpus Christi	State	TX	ZIP	78406

INSTRUMENTS USED					SYSTEM INFORMATION					
	Manufacturer	Model	Serial No.	Cal. Due	Manufacturer	Model	Serial No.	Manuf. Date		
Instrument #1	Radcal	9010	90-3378	30 Sep 2012	Reveal	CT-80	040255	Jan 2008		
Instrument #2	Radcal	10X5-180	17959	30 Sep 2012	Certified	Yes <input checked="" type="checkbox"/> No <input type="checkbox"/>	Place of Manufacture		Bedford, MA	
Instrument #3	Radcal	10X5-180	22359	30 Sep 2012	Type	Checkpoint <input type="checkbox"/>	EDS: In-line <input type="checkbox"/>	Stand-Alone	<input checked="" type="checkbox"/>	<input type="checkbox"/>
Instrument #4	Ludlum	3	286054	27 Sep 2012	Manufacturer Survey Date		13 Aug 2011			

VISUAL INSPECTION			
Y	N	Requirement	Y N
<input checked="" type="checkbox"/>	<input type="checkbox"/>	Warning label "Caution: X-Rays Produced When Energized" present at control panel? (21 CFR 1020.40(c)(8)(i))	<input checked="" type="checkbox"/> <input type="checkbox"/>
<input checked="" type="checkbox"/>	<input type="checkbox"/>	Warning label "Caution: Do Not Insert Any Part of the Body When System Is Energized - X-Ray Hazard" present at each port? (21 CFR 1020.40(c)(8)(ii))	<input checked="" type="checkbox"/> <input type="checkbox"/>
<input checked="" type="checkbox"/>	<input type="checkbox"/>	Two independent "x-ray on" indicators visible from control panel? (21 CFR 1020.40(c)(6)(iii))	<input checked="" type="checkbox"/> <input type="checkbox"/>
<input checked="" type="checkbox"/>	<input type="checkbox"/>	One "x-ray on" indicator visible from each port and access panel? (21 CFR 1020.40(c)(6)(iv))	<input checked="" type="checkbox"/> <input type="checkbox"/>
<input checked="" type="checkbox"/>	<input type="checkbox"/>	Key Activated Control present? (21 CFR 1020.40(c)(6)(i))	<input checked="" type="checkbox"/> <input type="checkbox"/>
<input type="checkbox"/>	<input checked="" type="checkbox"/>	Means to require operator presence at control panel? (21 CFR 1020.40(c)(10))	<input type="checkbox"/> <input checked="" type="checkbox"/>
			NT=not tested; NA=not applicable.

SURVEY DIAGRAM



Accessible exterior surfaces of cabinet scanned with Instrument #4. All scanning results below action levels? Yes No (If no, explain below)

DOSE TO BAGGAGE				EXPOSURE OUTSIDE CABINET				
Trial	Exposure (X_i)			Ambient Background 0.00 μR				
1	29.41 mR	$X_{avg} = 31.0 \text{ mR}$ $CV = 0.0953$ <p>Coefficient of Variation (CV):</p> $CV = (1/X_{avg})(\sum(X_i - X_{avg})^2/(n-1))^{1/2}$		Location	Exposure	Time	Exposure in 1 hr	RESULT
2	31.78 mR		a	5.21 μR	5.0 min	0.063 mR	PASS	
3	35.83 mR		b	2.70 μR	5.0 min	0.032 mR	PASS	
4	29.81 mR		c	μR	min	mR		
5	28.33 mR		d	μR	min	mR		
			e	μR	min	mR		

COMMENTS AND RECOMMENDATIONS

Dose to baggage measured with instrument #1/#3 combination.
Exposure outside cabinet measured with instrument #1/#2 combination.

Survey Worksheet - Cabinet X-Ray Systems

Health Physics Program
U.S. Army Public Health Command

Aberdeen Proving Ground, Maryland 21010-5403

SURVEY DATA				SURVEY LOCATION			
Project No.	26-MF-0FYM-12			Location	United/Continental CT-80		
Survey Date	10 Mar 2012			Organization	Corpus Christi International Airport		
Surveyor(s)	[REDACTED]			Street Address	1000 International Drive		
				City/Installation	Corpus Christi	State	TX ZIP 78406

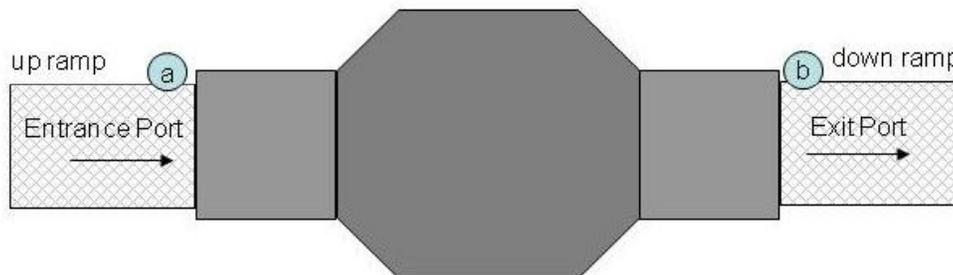
INSTRUMENTS USED				SYSTEM INFORMATION				
	Manufacturer	Model	Serial No.	Cal. Due	Manufacturer	Model	Serial No.	Manuf. Date
Instrument #1	Radcal	9010	90-3378	30 Sep 2012	Reveal	CT-80	040254	Jan 2008
Instrument #2	Radcal	10X5-180	17959	30 Sep 2012	Certified	Yes <input checked="" type="checkbox"/> No <input type="checkbox"/>	Place of Manufacture	Bedford, MA
Instrument #3	Radcal	10X5-180	22359	30 Sep 2012	Type	Checkpoint <input type="checkbox"/>	EDS: In-line <input type="checkbox"/> Stand-Alone <input checked="" type="checkbox"/>	
Instrument #4	Ludlum	3	286054	27 Sep 2012	Manufacturer Survey Date	9 Aug 2011		

VISUAL INSPECTION	
Y	N
<input checked="" type="checkbox"/>	Warning label "Caution: X-Rays Produced When Energized" present at control panel? (21 CFR 1020.40(c)(8)(i))
<input checked="" type="checkbox"/>	Warning label "Caution: Do Not Insert Any Part of the Body When System Is Energized - X-Ray Hazard" present at each port? (21 CFR 1020.40(c)(8)(ii))
<input checked="" type="checkbox"/>	Two independent "x-ray on" indicators visible from control panel? (21 CFR 1020.40(c)(6)(iii))
<input checked="" type="checkbox"/>	One "x-ray on" indicator visible from each port and access panel? (21 CFR 1020.40(c)(6)(iv))
<input checked="" type="checkbox"/>	Key Activated Control present? (21 CFR 1020.40(c)(6)(i))
NA	Means to require operator presence at control panel? (21 CFR 1020.40(c)(10))

<input checked="" type="checkbox"/>	Means to initiate and terminate x-ray generation? (21 CFR 1020.40(c)(6)(ii); 1020.40(c)(10)(i) or (ii))
<input checked="" type="checkbox"/>	Leaded drapes in good condition?
<input checked="" type="checkbox"/>	Interlocks not bypassed?
<input checked="" type="checkbox"/>	Current User's Manual available? (21 CFR 1020.40(c)(9))
<input checked="" type="checkbox"/>	Maintenance performed according to recommended schedule? (21 CFR 1020.40(c)(9))

NT=not tested; NA=not applicable.

SURVEY DIAGRAM



Accessible exterior surfaces of cabinet scanned with Instrument #4. All scanning results below action levels? Yes No (If no, explain below)

DOSE TO BAGGAGE			EXPOSURE OUTSIDE CABINET				
Trial	Exposure (X _i)		Ambient Background	0.00 μR			
1	36.10 mR		Location	Exposure	Time	Exposure in 1 hr	RESULT
2	43.38 mR		a	5.08 μR	5.0 min	0.061 mR	PASS
3	35.45 mR		b	1.80 μR	5.0 min	0.022 mR	PASS
4	36.23 mR		c	μR	min	mR	
5	36.93 mR		d	μR	min	mR	
			e	μR	min	mR	

X _{avg}	37.6	mR
CV	0.0868	

Coefficient of Variation (CV):
 $CV = (1/X_{avg})(\sum(X_i - X_{avg})^2/(n-1))^{1/2}$

COMMENTS AND RECOMMENDATIONS

Dose to baggage measured with instrument #1/#3 combination.
Exposure outside cabinet measured with instrument #1/#2 combination.

Final Survey Notes

Final Survey Notes

1. Project Information.

- a. Radiation Protection Survey No. 26-MF-0FYM-12
- b. Survey dates: 10 March 2012
- c. Corpus Christi International Airport (CRP), Corpus Christi, TX
- d. Survey Officer(s): [REDACTED]

2. Background Information.

a. TSA Headquarters Contact: Jill Segraves, Director, Occupational Safety, Health, and Environment (OSHE), phone: [REDACTED] e-mail: [REDACTED]

b. Airport Contacts: Tommy Johnson, Assistant Federal Security Director, Phone: [REDACTED]

c. Individuals Assisting the Survey Team:

Name	Title/Position
[REDACTED]	Health Physicist, TSA HQ
[REDACTED]	Transportation Security Manager

d. AIT (Backscatter X-Ray) System Surveyed:

Model	Serial No.	Location
Rapiscan Secure 1000 SP	S51009002	Checkpoint

e. Cabinet X-Ray Systems Surveyed:

Model	Serial No.	Location
Rapiscan 520B	7023805	Checkpoint, Lane 1
Rapiscan 520B	7065203	Checkpoint, Lane 2
Reveal CT-80	040255	Southwest Pod
Reveal CT-80	040254	United/Continental Pod

3. Findings and Recommendations.

a. AIT (Backscatter X-Ray) System.

(1) The x-ray personnel screening system surveyed was found to be in compliance with the radiation dose limits of American National Standards

MCHB-TS-OHP

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Institute/Health Physics Society (ANSI/HPS) Standard N43.17-2009, Radiation Safety for Personnel Security Screening Systems Using X-Ray or Gamma Radiation.

(2) The system surveyed was found to be in compliance with the other requirements of ANSI/HPS N43.17-2009.

b. Cabinet X-ray Systems.

(1) All systems surveyed were found to be in compliance with the radiation emission limits of Title 21, Code of Federal Regulations, Section 1020.40.

(2) All systems surveyed were found to be in compliance with the other requirements of Title 21, Code of Federal Regulations, Section 1020.40.

(3) The following item was also noted during the surveys: Reveal CT-80, Serial No. 040254, United/Continental: The date of the service provider's survey was not posted on the system nor was a copy of the service provider's survey available. A copy of the service provider's most recent survey form was obtained on March 12, 2012, and indicated the system was last surveyed on August 9, 2011.