U.S. Department of Homeland Security
601 South 12th Street
Arlington, VA 20598-6017

Transportation Security Administration

March 2, 2012

Mr. Robert McKenrick
Federal Security Director
Transportation Security Administration
La Guardia Airport (LGA)

Dear Mr. McKenrick:

The TSA Office of Occupational Safety, Health, and Environment (OSHE) 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 selected cabinet x-ray systems used at TSA Long Island McArthur Airport (ISP) was conducted on March 29-30, 2011, 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 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 (Section 1020.40 Cabinet x-ray systems), and to identify any health hazards associated with the use of these x-ray systems.

Results of Survey

The findings of the surveyed cabinet x-ray systems are described in the attached report and in the survey worksheets (Enclosure 1 of the report). The findings are summarized below.

Six cabinet x-ray systems were evaluated to verify compliance with the requirements of Title 21, CFR, Subchapter J, Section 1020.40. All were found to be in compliance with the radiation emissions limit specified in the regulation. There are no health hazards associated with the use of these cabinet x-ray systems provided the appropriate operating procedures are followed.

All of the cabinet x-ray systems complied with other, non-emission, requirements of Title 21, CFR, Subchapter J with five exceptions. See paragraphs (a) through (e) on pages 1 and 2 of the report. In addition, the survey officers noted two "administrative items" during the surveys. These findings are described on page 2 of the report.

Your early attention to correcting the identified findings is requested. Please contact the TSA Service Response Center at 1-800-820-8535 for assistance, and advise me of progress via email by March 30, 2012, or when the corrections are 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

Jill Segraves, CSP
Director
Office of Occupational Safety, Health, and Environment

cc: Christine Halfacre, Chief of Staff, Office of Security Technology
Daniel Ronan, Deputy FSD / Designated Occupational Safety and Health Official
Barney Rabbito, Collateral Duty Safety Officer (LGA)

Enclosure: TSA ISP Radiation Protection Survey Report, dated 23 June 2011

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

Health Physics Program 2 3 JUN 2011

Ms. Jill Segraves
Transportation Security Administration
TSA-170SHE
601 South 12th Street
Arlington, Virginia 22202

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: Radiation, 25 March 2011; and Title 21, Code of Federal Regulations (CFR), Subchapter J.

A radiation protection survey was performed on 29-30 March 2011 at Long Island McArthur Airport (ISP), Islip, NY, Project No. 26-MF-0EJE-11. The survey was performed to:

a. evaluate selected cabinet x-ray systems to ensure compliance with the requirements of Title 21, CFR, Subchapter J.

b. identify any health hazards associated with the use of these x-ray systems.

c. 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 (HPP), Army Institute of Public Health (AIPH) and [redacted] CHP, HPP, AIPH. A total of six cabinet x-ray systems were evaluated for compliance with the requirements of Title 21, CFR, Subchapter J. The survey results for each system are provided in Enclosure 1.

All 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.

All systems were found to be in compliance with the other requirements of Title 21, CFR, Subchapter J, with the following exceptions:

a. All Smiths Detection 6040i systems, West Checkpoint, Lanes 1-3: The control panel warning label "Caution: X-Rays Produced When Energized" was missing.

b. Two Smiths Detection 6040i systems, West Checkpoint, Lanes 1-2: The warning label "Caution: Do Not Insert Any Part of the Body When System Is Energized - X-Ray Hazard" was missing at the exit ports.

c. Reveal CT-80, SN 040097, US Air CT-80 Station: The control panel warning label "Caution: X-Rays Produced When Energized" was missing.

d. Reveal CT-80, SN 040088, Delta CT-80 Station: The warning label "Caution: Do Not Insert Any Part of the Body When System Is Energized - X-Ray Hazard" was missing at the exit port.

e. Reveal CT-80, SN 040633, Southwest CT-80 Station: The warning label "Caution: Do Not Insert Any Part of the Body When System Is Energized - X-Ray Hazard" was missing at the entrance port.

In addition, the survey officers noted the following administrative items during the surveys:

a. All six systems surveyed: The maintenance service provider's survey date was not posted on the system.

b. Smiths Detection 6040i, SN 40272, West Checkpoint, Lane 2: The "x-ray on" light was inoperable at the exit port on the passenger's side.

Long-term measurements using area dosimeters are being made on two of the Reveal CT-80 cabinet x-ray systems. These additional measurements are being made at the request of the ISP TSA staff. Two dosimeters, as noted in Enclosure 1, were mounted on each of the following CT-80 cabinet x-ray systems: SN 040097 and SN 040633. A control dosimeter was also provided. All five dosimeters will be returned and analyzed at the end of June 2011. The data from the area dosimeters will be used to update the potential doses to Transportation Security Officers who operate or work near these systems. The results of the long-term measurements will be provided in a separate report.

The survey officers discussed the survey results with Ms. Helene Herskowitz, Assistant Federal Security Director (FSD), Mr. Barney Rabbito, Program Analyst/ Collateral Duty Safety Officer (CDSO), Mr. Thomas Fitzpatrick, Transportation Security Manager and six other TSA staff members on 30 March 2011. A copy of the survey notes is provided in Enclosure 2.

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

Sincerely,

[redacted]

Portfolio Director
Occupational Health Sciences

Enclosures

Survey Results for 6 Cabinet X-Ray Systems

Encl 1

Survey Worksheet - Cabinet X-Ray Systems

Health Physics Program
U.S. Army Public Health Command (Provisional)
Aberdeen Proving Ground, Maryland 21010-5403

SURVEY DATA

Project No.	26-MF-0EJE-11
Survey Date	29 Mar 2011
Surveyor(s)	[redacted]

SURVEY LOCATION

Location	Delta CT-80 Station				
Organization	Long Island MacArthur				
Street Address	100 Arrival Ave				
City/Installation	Ronkonkoma	State	NY	ZIP	11779

INSTRUMENTS USED

	Manufacturer	*Model*	*Serial No.*	*Cal. Due*
Instrument #1	Radcal	9010	90-3315	30 Jul 2011
Instrument #2	Radcal	10X5-180(	10357	30 Jul 2011
Instrument #3	Radcal	10X5-180	18953	30 Jul 2011
Instrument #4	Tech Associates	P-8 Neon-A	010299	Resp Chkd*

SYSTEM INFORMATION

Manufacturer	*Model*	*Serial No.*	*Manuf. Date*
Reveal	CT-80	040088	May 2006

Certified	Yes	X	No		*Place of Manufacture*	Bedford, MA			
Type	Checkpoint		EDS:	In-line		Stand-Alone	X		
Manufacturer Survey Date	none found								

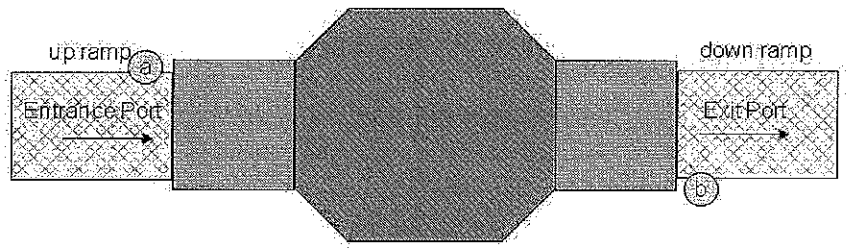
VISUAL INSPECTION

Y	N	*Requirement*
X		Warning label "Caution: X-Rays Produced When Energized" present at control panel? (21 CFR 1020.40(c)(8)(i))
	X	Warning label "Caution: Do Not Insert Any Part of the Body When System Is Energized - X-Ray Hazard" present at each port? (missing at exit port) (21 CFR 1020.40(c)(8)(ii))
X		Two independent "x-ray on" indicators visible from control panel? (21 CFR 1020.40(c)(6)(iii))
X		One "x-ray on" indicator visible from each port and access panel? (21 CFR 1020.40(c)(6)(iv))
X		Key Activated Control present? (21 CFR 1020.31(j))
NA		Means to require operator presence at control panel? (21 CFR 1020.40(c)(10))

Y	N	*Requirement*
X		Means to initiate and terminate x-ray generation? (21 CFR 1020.40(c)(6)(ii); 1020.40(c)(10)(i) or (ii))
X		Leaded drapes in good condition?
X		Interlocks not bypassed?
NT		Current User's Manual available? (21 CFR 1020.40(c)(9))
NT		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 [X] No [ ] (If no, explain below)

DOSE TO BAGGAGE

Trial	*Exposure (X_i)*	
1	36.55	mR
2	36.71	mR
3	43.47	mR
4	37.46	mR
5	42.11	mR

X_{avg}	39.3	mR
CV	0.0834	

Coefficient of Variation (CV):

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

EXPOSURE OUTSIDE CABINET

Ambient Background 0.00 µR

Location	*Exposure*		*Time*		*Exposure in 1 hr*		RESULT
a	0.00	µR	5.0	min	0.000	mR	PASS
b	1.65	µR	5.0	min	0.020	mR	PASS
c		µR	5.0	min		mR	
d		µR	5.0	min		mR	
e		µR	5.0	min		mR	

COMMENTS AND RECOMMENDATIONS

Dose to baggage measured with instrument #1/#3 combination.
Exposure outside cabinet measured with instrument #1/#2 combination.
*Instrument was response checked on 28 and 31 March 2011.

Survey Worksheet - Cabinet X-Ray Systems

Health Physics Program

U.S. Army Public Health Command (Provisional)

Aberdeen Proving Ground, Maryland 21010-5403

SURVEY DATA

Project No.	26-MF-0BJE-11
Survey Date	29 Mar 2011
Surveyor(s)	[redacted]

SURVEY LOCATION

Location	US Air CT-80 Station				
Organization	Long Island MacArthur				
Street Address	100 Arrival Ave				
City/Installation	Ronkonkoma	State	NY	ZIP	11779

INSTRUMENTS USED

	Manufacturer	*Model*	*Serial No.*	*Cal. Due*
Instrument #1	Radcal	9010	90-3315	30 Jul 2011
Instrument #2	Radcal	10X5-1800	10357	30 Jul 2011
Instrument #3	Radcal	10X5-180	18953	30 Jul 2011
Instrument #4	Tech Associates	P-8 Neon-A	010299	Resp Chkd*

SYSTEM INFORMATION

Manufacturer	*Model*	*Serial No.*	*Manuf. Date*
Reveal	CT-80	040097	May 2006

Certified	Yes	X	No		*Place of Manufacture*	Bedford, MA	
Type	Checkpoint		EDS:	In-line		Stand-Alone	X
Manufacturer Survey Date	none found						

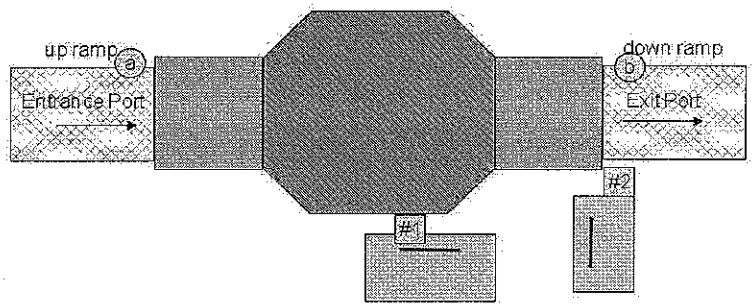
VISUAL INSPECTION

Y	N	*Requirement*
	X	Warning label "Caution: X-Rays Produced When Energized" present at control panel? (21 CFR 1020.40(c)(8)(i))
X		Warning label "Caution: Do Not Insert Any Part of the Body When System Is Energized - X-Ray Hazard" present at each port? (worn) (21 CFR 1020.40(c)(8)(ii))
X		Two independent "x-ray on" indicators visible from control panel? (21 CFR 1020.40(c)(6)(iii))
X		One "x-ray on" indicator visible from each port and access panel? (21 CFR 1020.40(c)(6)(iv))
X		Key Activated Control present? (21 CFR 1020.31(j))
NA		Means to require operator presence at control panel? (21 CFR 1020.40(c)(10))

Y	N	*Requirement*
X		Means to initiate and terminate x-ray generation? (21 CFR 1020.40(c)(6)(ii); 1020.40(c)(10)(i) or (ii))
X		Leaded drapes in good condition?
X		Interlocks not bypassed?
NT		Current User's Manual available? (21 CFR 1020.40(c)(9))
NT		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 X No (If no, explain below)

DOSE TO BAGGAGE

Trial	*Exposure (X_i)*	
1	42.98	mR
2	39.21	mR
3	43.76	mR
4	39.94	mR
5	43.72	mR

X_{avg}	41.9	mR
CV	0.052	

Coefficient of Variation (CV):

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

EXPOSURE OUTSIDE CABINET

Ambient Background 0.00 µR

Location	*Exposure*		*Time*		*Exposure in 1 hr*		RESULT
a	0.00	µR	5.0	min	0.000	mR	PASS
b	8.40	µR	5.0	min	0.101	mR	PASS
c		µR	5.0	min		mR	
d		µR	5.0	min		mR	
e		µR	5.0	min		mR	

COMMENTS AND RECOMMENDATIONS

Dose to baggage measured with instrument #1/#3 combination.

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

*Instrument was response checked on 28 and 31 March 2011.

OSL dosimeters mounted near system at locations labeled #1 (1730) and #2 (1731) in diagram.

Survey Worksheet - Cabinet X-Ray Systems

Health Physics Program

U.S. Army Public Health Command (Provisional)

Aberdeen Proving Ground, Maryland 21010-5403

SURVEY DATA

Project No.	26-MP-0EJE-11
Survey Date	29 Mar 2011
Surveyor(s)	[redacted]

SURVEY LOCATION

Location	Southwest CT-80 Station				
Organization	Long Island MacArthur				
Street Address	100 Arrival Ave				
City/Installation	Ronkonkoma	State	NY	ZIP	11779

INSTRUMENTS USED

	Manufacturer	*Model*	*Serial No.*	*Cal. Due*
Instrument #1	Radcal	9010	90-3315	30 Jul 2011
Instrument #2	Radcal	10X5-1800	10357	30 Jul 2011
Instrument #3	Radcal	10X5-180	18953	30 Jul 2011
Instrument #4	Tech Associates	P-8 Neon-/	010299	Resp Chkd*

SYSTEM INFORMATION

Manufacturer	*Model*	*Serial No.*	*Manuf. Date*
Reveal	CT-80	040633	Oct 2009

Certified	Yes	X	No		*Place of Manufacture*	Bedford, MA		
Type	Checkpoint		EDS:	In-line		Stand-Alone	X	
Manufacturer Survey Date	none found							

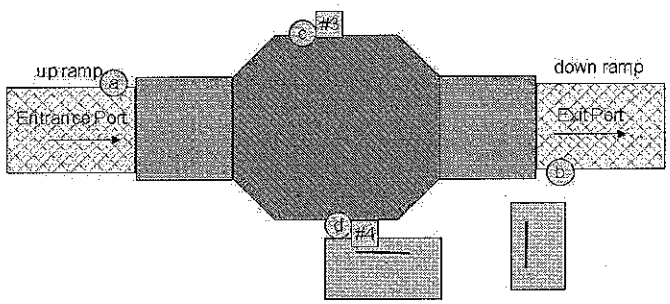
VISUAL INSPECTION

Y	N	*Requirement*
X		Warning label "Caution: X-Rays Produced When Energized" present at control panel? (21 CFR 1020.40(c)(8)(i))
	X	Warning label "Caution: Do Not Insert Any Part of the Body When System Is Energized - X-Ray Hazard" present at each port? (missing at entrance port) (21 CFR 1020.40(c)(8)(ii))
X		Two independent "x-ray on" indicators visible from control panel? (21 CFR 1020.40(c)(6)(iii))
X		One "x-ray on" indicator visible from each port and access panel? (21 CFR 1020.40(c)(6)(iv))
X		Key Activated Control present? (21 CFR 1020.31(j))
NA		Means to require operator presence at control panel? (21 CFR 1020.40(c)(10))

Y	N	*Requirement*
X		Means to initiate and terminate x-ray generation? (21 CFR 1020.40(c)(6)(ii); 1020.40(c)(10)(i) or (ii))
X		Leaded drapes in good condition?
X		Interlocks not bypassed?
NT		Current User's Manual available? (21 CFR 1020.40(c)(9))
NT		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 [X] (If no, explain below)

DOSE TO BAGGAGE

Trial	*Exposure (X_i)*	
1	34.96	mR
2	25.54	mR
3	30.79	mR
4	31.21	mR
5	31.67	mR

X_{avg}	30.8	mR
CV	0.1099	

Coefficient of Variation (CV):

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

EXPOSURE OUTSIDE CABINET

Ambient Background 0.00 µR

Location	*Exposure*		*Time*		*Exposure in 1 hr*		RESULT
a	0.00	µR	5.0	min	0.000	mR	PASS
b	4.08	µR	5.0	min	0.049	mR	PASS
c	6.78	µR	5.0	min	0.081	mR	PASS
d	3.42	µR	5.0	min	0.041	mR	PASS
e		µR	5.0	min		mR	

COMMENTS AND RECOMMENDATIONS

Dose to baggage measured with instrument #1/#3 combination.

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

*Instrument was response checked on 28 and 31 March 2011.

Scanning above action level at locations c and d; therefore, additional exposure measurements performed. Results below limit.

OSL dosimeters mounted on/near system at above action level locations labeled #3 (1732) and #4 (1733) in diagram.

Survey Worksheet - Cabinet X-Ray Systems

Health Physics Program

U.S. Army Public Health Command (Provisional)

Aberdeen Proving Ground, Maryland 21010-5403

SURVEY DATA

Project No.	26-MF-0EJE-11
Survey Date	29 Mar 2011
Surveyor(s)	[redacted]

SURVEY LOCATION

Location	West Checkpoint, Lane 2				
Organization	Long Island MacArthur				
Street Address	100 Arrival Ave				
City/Installation	Ronkonkoma	State	NY	ZIP	11779

INSTRUMENTS USED

	Manufacturer	*Model*	*Serial No.*	*Cal. Due*
Instrument #1	Radcal	9010	90-3315	30 Jul 2011
Instrument #2	Radcal	10X5-180(	10357	30 Jul 2011
Instrument #3	Radcal	10X5-180	18953	30 Jul 2011
Instrument #4	Tech Associates	P-8 Neon-/	010299	Resp Chkd*

SYSTEM INFORMATION

Manufacturer	*Model*	*Serial No.*	*Manuf. Date*
Smiths Detection	6040i	40272	July 2003

Certified Yes [X] No [ ] *Place of Manufacture* Weisbaden, GE

Type Checkpoint [X] EDS: In-line [ ] Stand-Alone [ ]

Manufacturer Survey Date none found

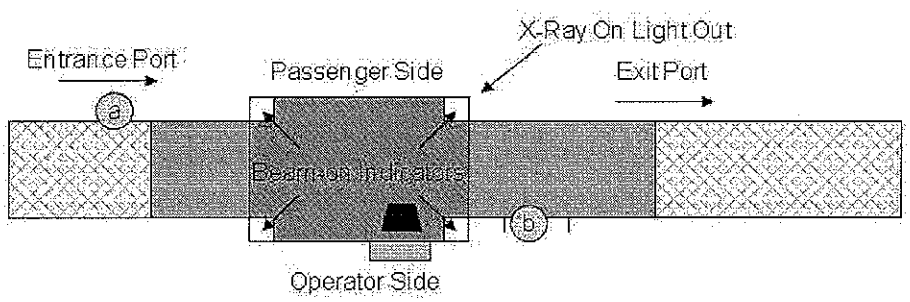
VISUAL INSPECTION

Y	N	*Requirement*
	X	Warning label "Caution: X-Rays Produced When Energized" present at control panel? (21 CFR 1020.40(c)(8)(i))
	X	Warning label "Caution: Do Not Insert Any Part of the Body When System Is Energized - X-Ray Hazard" present at each port? (missing at exit port) (21 CFR 1020.40(c)(8)(ii))
X		Two independent "x-ray on" indicators visible from control panel? (21 CFR 1020.40(c)(6)(iii))
X		One "x-ray on" indicator visible from each port and access panel? (light out as indicated in diagram) (21 CFR 1020.40(c)(6)(iv))
X		Key Activated Control present? (21 CFR 1020.31(j))
X		Means to require operator presence at control panel? (21 CFR 1020.40(c)(10))

Y	N	*Requirement*
X		Means to initiate and terminate x-ray generation? (21 CFR 1020.40(c)(6)(ii); 1020.40(c)(10)(i) or (ii))
X		Leaded drapes in good condition? (some wear)
X		Interlocks not bypassed?
NT		Current User's Manual available? (21 CFR 1020.40(c)(9))
NT		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 [X] No [ ] (If no, explain below)

DOSE TO BAGGAGE

Trial	*Exposure (X_i)*	
1	0.1421	mR
2	0.1364	mR
3	0.1319	mR
4	0.1147	mR
5	0.1609	mR

X_{avg}	0.14	mR
CV	0.122	

Coefficient of Variation (CV):

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

EXPOSURE OUTSIDE CABINET

Ambient Background 0.00 µR

Location	*Exposure*		*Time*		*Exposure in 1 hr*		RESULT
a	0.00	µR	5.0	min	0.000	mR	PASS
b	4.39	µR	5.0	min	0.053	mR	PASS
c		µR	5.0	min		mR	
d		µR	5.0	min		mR	
e		µR	5.0	min		mR	

COMMENTS AND RECOMMENDATIONS

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

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

*Instrument was response checked on 28 and 31 March 2011.

Empty bins were run through the system for the "exposure outside cabinet" measurements.

Survey Worksheet - Cabinet X-Ray Systems

Health Physics Program

U.S. Army Public Health Command (Provisional)

Aberdeen Proving Ground, Maryland 21010-5403

SURVEY DATA

Project No.	26-MF-0EJE-11
Survey Date	29 Mar 2011
Surveyor(s)	[redacted]

SURVEY LOCATION

Location	West Checkpoint, Lane 1				
Organization	Long Island MacArthur				
Street Address	100 Arrival Ave				
City/Installation	Ronkonkoma	State	NY	ZIP	11779

INSTRUMENTS USED

	Manufacturer	Model	Serial No.	Cal. Due
Instrument #1	Radcal	9010	90-3315	30 Jul 2011
Instrument #2	Radcal	10X5-1800	10357	30 Jul 2011
Instrument #3	Radcal	10X5-180	18953	30 Jul 2011
Instrument #4	Tech Associates	P-8 Neon-A	010299	Resp Chkd*

SYSTEM INFORMATION

Manufacturer	Model	Serial No.	Manuf. Date
Smiths Detection	6040i	40273	July 2003

Certified	Yes	X	No		*Place of Manufacture*	Weisbaden, GE	
Type	Checkpoint	X	EDS:	In-line		Stand-Alone	
Manufacturer Survey Date	none found						

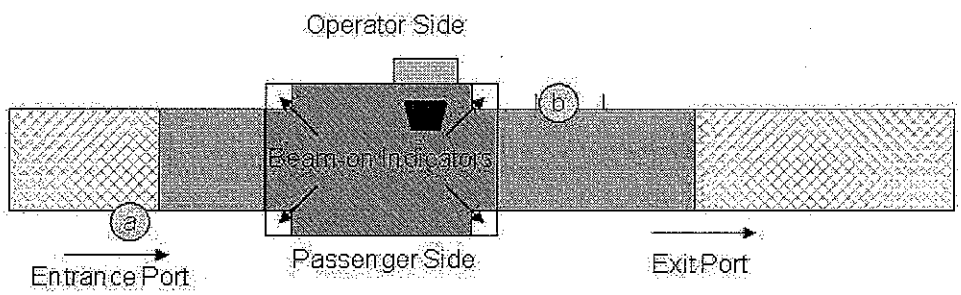
VISUAL INSPECTION

Y	N	Requirement
	X	Warning label "Caution: X-Rays Produced When Energized" present at control panel? (21 CFR 1020.40(c)(8)(i))
	X	Warning label "Caution: Do Not Insert Any Part of the Body When System Is Energized - X-Ray Hazard" present at each port? (missing at exit port) (21 CFR 1020.40(c)(8)(ii))
X		Two independent "x-ray on" indicators visible from control panel? (21 CFR 1020.40(c)(6)(iii))
X		One "x-ray on" indicator visible from each port and access panel? (21 CFR 1020.40(c)(6)(iv))
X		Key Activated Control present? (21 CFR 1020.31(j))
X		Means to require operator presence at control panel? (21 CFR 1020.40(c)(10))

Y	N	Requirement
X		Means to initiate and terminate x-ray generation? (21 CFR 1020.40(c)(6)(ii); 1020.40(c)(10)(i) or (ii))
X		Leaded drapes in good condition?
X		Interlocks not bypassed?
NT		Current User's Manual available? (21 CFR 1020.40(c)(9))
NT		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 X No (If no, explain below)

DOSE TO BAGGAGE

Trial	Exposure (X_i)	
1	0.1615	mR
2	0.1934	mR
3	0.1830	mR
4	0.1869	mR
5	0.1937	mR

X_{avg}	0.18	mR
CV	0.0719	

Coefficient of Variation (CV):

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

EXPOSURE OUTSIDE CABINET

Ambient Background 0.00 µR

Location	Exposure		Time		Exposure in 1 hr		RESULT
a	0.00	µR	5.0	min	0.000	mR	PASS
b	6.64	µR	5.0	min	0.080	mR	PASS
c		µR	5.0	min		mR	
d		µR	5.0	min		mR	
e		µR	5.0	min		mR	

COMMENTS AND RECOMMENDATIONS

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

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

*Instrument was response checked on 28 and 31 March 2011.

Empty bins were run through the system for the "exposure outside cabinet" measurements.

Survey Worksheet - Cabinet X-Ray Systems

Health Physics Program

U.S. Army Public Health Command (Provisional)

Aberdeen Proving Ground, Maryland 21010-5403

SURVEY DATA

Project No.	26-MF-0EJE-11
Survey Date	29 Mar 2011
Surveyor(s)	[redacted]

SURVEY LOCATION

Location	West Checkpoint, Lane 3				
Organization	Long Island MacArthur				
Street Address	100 Arrival Ave				
City/Installation	Ronkonkoma	State	NY	ZIP	11779

INSTRUMENTS USED

	Manufacturer	*Model*	*Serial No.*	*Cal. Due*
Instrument #1	Radcal	9010	90-3315	30 Jul 2011
Instrument #2	Radcal	10X5-180(	10357	30 Jul 2011
Instrument #3	Radcal	10X5-180	18953	30 Jul 2011
Instrument #4	Tech Associates	P-8 Neon-A	010299	Resp Chkd*

SYSTEM INFORMATION

Manufacturer	*Model*	*Serial No.*	*Manuf. Date*
Smiths Detection	6040i	40366	Oct. 2003

Certified	Yes	X	No		*Place of Manufacture*	Weisbaden, GE	
Type	Checkpoint	X	EDS:	In-line		Stand-Alone	
Manufacturer Survey Date	none found						

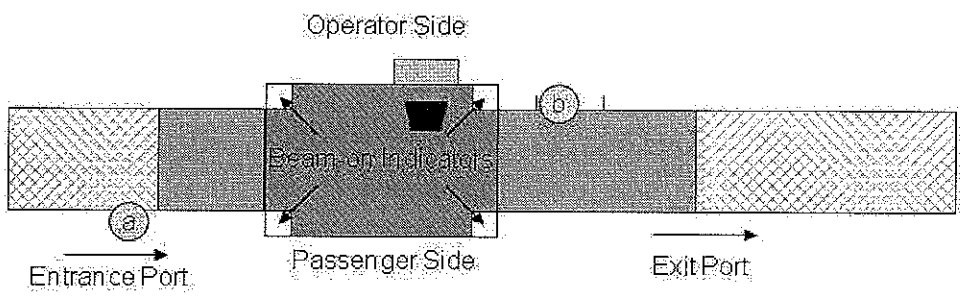
VISUAL INSPECTION

Y	N	*Requirement*
	X	Warning label "Caution: X-Rays Produced When Energized" present at control panel? (21 CFR 1020.40(c)(8)(i))
X		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))
X		Two independent "x-ray on" indicators visible from control panel? (21 CFR 1020.40(c)(6)(iii))
X		One "x-ray on" indicator visible from each port and access panel? (21 CFR 1020.40(c)(6)(iv))
X		Key Activated Control present? (21 CFR 1020.31(j))
X		Means to require operator presence at control panel? (21 CFR 1020.40(c)(10))

Y	N	*Requirement*
X		Means to initiate and terminate x-ray generation? (21 CFR 1020.40(c)(6)(ii); 1020.40(c)(10)(i) or (ii))
X		Leaded drapes in good condition?
X		Interlocks not bypassed?
NT		Current User's Manual available? (21 CFR 1020.40(c)(9))
NT		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 [X] No [ ] (If no, explain below)

DOSE TO BAGGAGE

Trial	*Exposure (X_i)*	
1	0.1337	mR
2	0.1343	mR
3	0.1365	mR
4	0.1396	mR
5	0.1435	mR

X_{avg}	0.14	mR
CV	0.0296	

Coefficient of Variation (CV):

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

EXPOSURE OUTSIDE CABINET

Ambient Background 0.00 µR

Location	*Exposure*		*Time*		*Exposure in 1 hr*		RESULT
a	0.00	µR	5.0	min	0.000	mR	PASS
b	5.94	µR	5.0	min	0.071	mR	PASS
c		µR	5.0	min		mR	
d		µR	5.0	min		mR	
e		µR	5.0	min		mR	

COMMENTS AND RECOMMENDATIONS

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

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

*Instrument was response checked on 28 and 31 March 2011.

Empty bins were run through the system for the "exposure outside cabinet" measurements.

Survey Notes Provided on 30 March 2011

Encl 2

Exit Briefing Notes

1. Project Information.

   a. Radiation Protection Survey No. 26-MF-0EJE-11

   b. Survey dates: 29 March 2011

   c. Long Island MacArthur (ISP), Ronkonkoma, NY

   d. Survey Officer(s): [redacted]

2. Background Information.

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

   b. Airport Contacts:

      (1) Barney Rabbito, CDSO, Phone: [redacted]

      (2) Helene Herskowitz, Assistant FSD, Phone: [redacted]

      (3) Tom Fitzpatrick, Transportation Security Manager, Phone: [redacted]

   c. Cabinet x-ray systems surveyed:

Model	Serial No.	Location
Smiths Detection 6040i	40273	West Checkpoint, Lane 1
Smiths Detection 6040i	40272	West Checkpoint, Lane 2
Smiths Detection 6040i	40366	West Checkpoint, Lane 3
Reveal CT-80	040088	Delta CT-80 Station
Reveal CT-80	040097	US Air CT-80 Station
Reveal CT-80	040633	Southwest CT-80 Station

3. Findings and Recommendations.

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

b. All systems were found to be in compliance with the other requirements of Title 21, Code of Federal Regulations, Section 1020.40, with the following exceptions:

(1) All Smiths Detection 6040i systems, West Checkpoint, Lanes 1-3: The control panel warning label "Caution: X-Rays Produced When Energized" was missing.

(2) Two Smiths Detection 6040i systems, West Checkpoint, Lanes 1-2: The warning label "Caution: Do Not Insert Any Part of the Body When System Is Energized - X-Ray Hazard" was missing at the exit ports.

(3) Reveal CT-80, SN 040097, US Air CT-80 Station: The control panel warning label "Caution: X-Rays Produced When Energized" was missing.

(4) Reveal CT-80, SN 040088, Delta CT-80 Station: The warning label "Caution: Do Not Insert Any Part of the Body When System Is Energized - X-Ray Hazard" was missing at the exit port.

(5) Reveal CT-80, SN 040633, Southwest CT-80 Station: The warning label "Caution: Do Not Insert Any Part of the Body When System Is Energized - X-Ray Hazard" was missing at the entrance port.

c. The following items were also noted during the surveys:

(1) All six systems surveyed: The maintenance service provider's survey date was not posted on the system.

(2) Smiths Detection 6040i, SN 40272, West Checkpoint, Lane 2: The "x-ray on" light was inoperable at the exit port on the passenger's side.