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

13 MAY 2011

Health Physics Program

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 US Army Medical Command and the Transportation Security Administration (TSA), signed September 10, 2008; electronic mail message, subject: 2400.2.1 ORD AIT Radiation Surveys, 4 January 2011; and Title 21, Code of Federal Regulations (CFR), Subchapter J.

A radiation protection survey was performed on 18-21 January 2011 at Chicago O'Hare International Airport (ORD), Chicago, IL, Project No. 26-MF-0E7J-11. The survey was performed to:

a. Evaluate the advanced imaging technology (AIT) x-ray systems to ensure compliance with the requirements of American National Standards Institute/Health Physics Society (ANSI/HPS) N43.17-2009.

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

c. Provide recommendations to assist in correcting any areas of noncompliance or health hazards.

The survey was performed by [redacted] Certified Health Physicist (CHP); [redacted] CHP; and [redacted], Health Physicist, Health Physics Program, Army Institute of Public Health (AIPH). A total of 22 AIT x-ray systems were evaluated for compliance with the requirements of ANSI/HPS N43.17-2009. The survey results for each system are provided in Enclosure 1.

All x-ray systems tested were 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 these systems provided appropriate operating procedures are followed.

All systems were found to be in compliance with the other requirements of ANSI/HPS N43.17-2009, with the following exception - the warning label "Caution: X-Rays Produced when Energized" was not present at the location where scans can be initiated for all Rapiscan Secure 1000SP systems.

In addition, the survey officers noted the following systems did not have a maintenance service provider survey date posted on system: AIT Nos. 1, 4, 5, 6, 7, 8, 9, 13, 14, 18, 19, 20, 22, 23.

Based on measurements at the inspection zone boundary, it is estimated that an individual would need to be present at the inspection zone boundary for 1,000,000 screenings in one year to reach the public dose limit. Assuming 600 screening are accomplished each hour, then an individual would need to be at the inspection zone boundary for 1666 hours of the work year to reach the public dose limit of 100 millirem per year.

Long term measurements using area dosimeters are being made on four AIT systems (Terminal 1, AIT No. 7; Terminal 2, AIT No. 13; Terminal 3, AIT No. 19; Terminal 5, AIT No. 23). Six dosimeters were mounted on each system. The area dosimeters will be collected in approximately two to three months. The measurement data from the area dosimeters along with the number of screenings on each of the four monitored systems over this time period will be used to refine the estimates of the potential dose to Transportation Security Officers (TSO) who operate or work near these systems. The results of these measurements will be provided in a separate report.

On 21 January 2011, the survey officers discussed the survey results with Kathleen Petrowsky, Federal Security Director; Kenneth Fletcher, Deputy Federal Security Director; Mark Lendvay, Assistant Federal Security Director - Operations; Gregory Hanson, Safety Specialist; Robert Sanford, Safety Specialist; and 11 other management and employee representatives. 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] CIH
Portfolio Manager
Occupational Health Sciences

Enclosures

Survey Results for 22 AIT X-Ray Systems

Encl 1

Survey Worksheet - AIT 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-0E7J-11
Survey Date	19 Jan 2011
Surveyor(s)	[redacted]

SURVEY LOCATION

Location	Terminal 1, Checkpoint 1, Lanes 1-2, AIT # 1				
Organization	Chicago O'Hare International				
Street Address					
City/Installation	Chicago	State	IL	ZIP	

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	WB Johnson	TVX-2000	40174	*

SYSTEM INFORMATION

Manufacturer	*Model*	*Serial No.*	*Manuf. Date*
Rapiscan	Secure 1000SP	S51002003	Jan 2010

Certified	NA	***Place of Manufacture***	Torrance, CA
Service Provider Survey Date	Not Found		

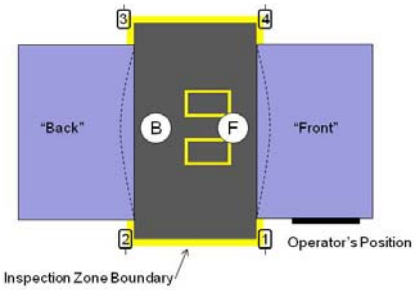
VISUAL INSPECTION

Y	N	*Requirement*
X		Key activated control with key capture? (21 CFR 1020.31(j); ANSI N43.17-2009, paragraph 7.2.1.c)
	X	"Caution: X-Rays Produced When Energized" label present at control to initiate scan? (21 CFR 1020.31(j); ANSI N43.17-2009, paragraph 7.2.2.d)
X		Technique factors preset for each mode of operation? (21 CFR 1020.31(j); ANSI N43.17-2009, paragraph 7.2.2.b)
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		Means to terminate emission of radiation other than an interlock? (ANSI N43.17-2009, paragraph 7.2.1.e)
X		Scan in progress indicator visible for any location from which a scan can be inititiated? (ANSI N43.17-2009, paragraph 7.2.1.a)

Y	N	*Requirement*
X		At least one lighted scan in progress indicator visible from the inspection zone? (ANSI N43.17-2009, paragraph 7.2.1.b)
X		X-ray emission terminates after a present time or exposure? (21 CFR 1020.31(j); ANSI N43.17-2009, paragraph 7.2.2.e)
X		Operators have a clear view of the scanning area? (21 CFR 1020.31(j); ANSI N43.17-2009, paragraph 7.2.1.f)
X		Tool or key required to open or remove access panels? (21 CFR 1020.31(j); ANSI N43.17-2009, paragraph 7.2.1.i)
NT		User provided with required information? (21 CFR 1020.31(j); ANSI N43.17-2009, paragraph 7.5)

NT=not tested; NA=not applicable.

SURVEY DIAGRAM



SCANNING MEASUREMENTS

Scanning below action levels? Yes [X] No [ ]

(If no, explain in comments)

Inspection zone boundary scanned with Instrument #3.

SCATTERED RADIATION

Location	*Scan 1*		*Scan 2*		*Scan 3*		*Average*	
1	0	µR	0	µR	0	µR	0.00	µR
2	0.13	µR	0.07	µR	0.07	µR	0.09	µR
3	0	µR	0.13	µR	0.07	µR	0.07	µR
4	0	µR	0	µR	0	µR	0.00	µR

Measurements made with Instruments #1 & #2

DOSE PER SCREENING

	Exposure (X)			
Trial	*"Front" Side*		*"Back" Side*	
a	5.62	µR	5.56	µR
b	5.49	µR	5.49	µR
c	5.35	µR	5.49	µR
d	5.56	µR	5.49	µR
e	5.42	µR	5.49	µR
AVG	5.49	µR	5.50	µR

Energy Correctin Factor 1.25

Reference Effective Dose per Screening (max 25 µrem)[1]:

1.9 µrem

or

0.019 µSv

RESULT **PASS**

Measurements made with Instruments #1 & #2

BEAM QUALITY

	Exposure (X)			
mm Al	*"Front" Side*		*"Back" Side*	
0	1.14	µR	1.34	µR
0	1.14	µR	1.34	µR
1	0.60	µR	0.73	µR
1	0.60	µR	0.74	µR
1.5	0.47	µR	0.60	µR
1.5	0.47	µR	0.60	µR

HVL "Front" Side	**1.1**	mm Al
HVL "Back" Side	**1.2**	mm Al
Conversion Factor	**0.135**	
Min. Filtration[1]	**1.0**	**mm Al**

[1] An HVL of 1 mm Al corresonds to a filtration of 1 mm Al for this system

RESULT **PASS**

Measurements made with Instruments #1 & #2

COMMENTS AND RECOMMENDATIONS

* The WB Johnson TVX-2000 was response checked prior to the survey.

Survey Worksheet - AIT 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-0E7J-11
Survey Date	19 Jan 2011
Surveyor(s)	[redacted]

SURVEY LOCATION

Location	Terminal 1, Checkpoint 1, Lanes 3-4, AIT # 2				
Organization	Chicago O'Hare International				
Street Address					
City/Installation	Chicago	State	IL	ZIP	

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	WB Johnson	TVX-2000	40174	*

SYSTEM INFORMATION

Manufacturer	Model	Serial No.	Manuf. Date
Rapiscan	Secure 1000SP	S51002001	Jan 2010

Certified	NA	***Place of Manufacture***	Torrance, CA
Service Provider Survey Date	Dec 2010		

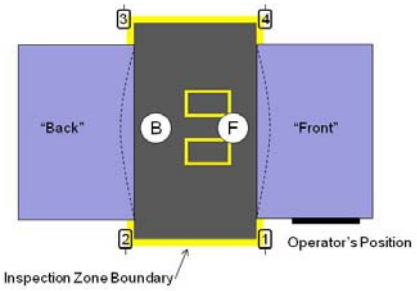
VISUAL INSPECTION

Y	N	Requirement
X		Key activated control with key capture? (21 CFR 1020.31(j); ANSI N43.17-2009, paragraph 7.2.1.c)
	X	"Caution: X-Rays Produced When Energized" label present at control to initiate scan? (21 CFR 1020.31(j); ANSI N43.17-2009, paragraph 7.2.2.d)
X		Technique factors preset for each mode of operation? (21 CFR 1020.31(j); ANSI N43.17-2009, paragraph 7.2.2.b)
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		Means to terminate emission of radiation other than an interlock? (ANSI N43.17-2009, paragraph 7.2.1.e)
X		Scan in progress indicator visible for any location from which a scan can be inititiated? (ANSI N43.17-2009, paragraph 7.2.1.a)

Y	N	Requirement
X		At least one lighted scan in progress indicator visible from the inspection zone? (ANSI N43.17-2009, paragraph 7.2.1.b)
X		X-ray emission terminates after a present time or exposure? (21 CFR 1020.31(j); ANSI N43.17-2009, paragraph 7.2.2.e)
X		Operators have a clear view of the scanning area? (21 CFR 1020.31(j); ANSI N43.17-2009, paragraph 7.2.1.f)
X		Tool or key required to open or remove access panels? (21 CFR 1020.31(j); ANSI N43.17-2009, paragraph 7.2.1.i)
NT		User provided with required information? (21 CFR 1020.31(j); ANSI N43.17-2009, paragraph 7.5)

NT=not tested; NA=not applicable.

SURVEY DIAGRAM



SCANNING MEASUREMENTS

Scanning below action levels? Yes [X] No [ ]
(If no, explain in comments)

Inspection zone boundary scanned with Instrument #3.

SCATTERED RADIATION

Location	Scan 1		Scan 2		Scan 3		Average	
1	0	µR	0	µR	0	µR	0.00	µR
2	0	µR	0.07	µR	0.07	µR	0.05	µR
3	0	µR	0.07	µR	0.07	µR	0.05	µR
4	0	µR	0	µR	0	µR	0.00	µR

Measurements made with Instruments #1 & #2

DOSE PER SCREENING

	Exposure (X)			
Trial	"Front" Side		"Back" Side	
a	6.28	µR	6.24	µR
b	6.49	µR	6.08	µR
c	6.42	µR	6.42	µR
d	6.54	µR	6.35	µR
e	6.42	µR	6.22	µR
AVG	6.43	µR	6.26	µR

Energy Correctin Factor 1.25

Reference Effective Dose per Screening (max 25 µrem)[1]:
2.2 µrem
or
0.022 µSv

RESULT **PASS**

Measurements made with Instruments #1 & #2

BEAM QUALITY

	Exposure (X)			
mm Al	"Front" Side		"Back" Side	
0	1.20	µR	1.33	µR
0	1.27	µR	1.27	µR
1	0.67	µR	0.73	µR
1	0.67	µR	0.73	µR
1.5	0.60	µR	0.53	µR
1.5	0.53	µR	0.60	µR

HVL "Front" Side	1.2	mm Al
HVL "Back" Side	1.2	mm Al
Conversion Factor	0.136	
Min. Filtration[1]	1.0	**mm Al**

[1] An HVL of 1 mm Al corresonds to a filtration of 1 mm Al for this system

RESULT **PASS**

Measurements made with Instruments #1 & #2

COMMENTS AND RECOMMENDATIONS

* The WB Johnson TVX-2000 was response checked prior to the survey.

Survey Worksheet - AIT 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-0E7J-11
Survey Date	19 Jan 2011
Surveyor(s)	[redacted]

SURVEY LOCATION

Location	Terminal 1, Checkpoint 1, Lanes 7-8, AIT # 4				
Organization	Chicago O'Hare International				
Street Address					
City/Installation	Chicago	State	IL	ZIP	

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	WB Johnson	TVX-2000	40174	*

SYSTEM INFORMATION

Manufacturer	*Model*	*Serial No.*	*Manuf. Date*
Rapiscan	Secure 1000SP	S50952006	Dec 2009

Certified	NA	***Place of Manufacture***	Torrance, CA
Service Provider Survey Date	Not Found		

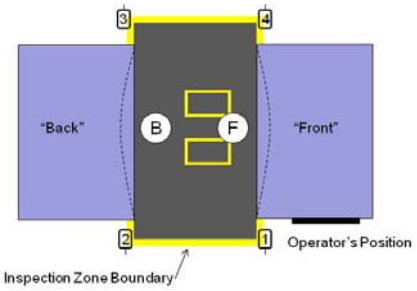
VISUAL INSPECTION

Y	N	*Requirement*
X		Key activated control with key capture? (21 CFR 1020.31(j); ANSI N43.17-2009, paragraph 7.2.1.c)
	X	"Caution: X-Rays Produced When Energized" label present at control to initiate scan? (21 CFR 1020.31(j); ANSI N43.17-2009, paragraph 7.2.2.d)
X		Technique factors preset for each mode of operation? (21 CFR 1020.31(j); ANSI N43.17-2009, paragraph 7.2.2.b)
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		Means to terminate emission of radiation other than an interlock? (ANSI N43.17-2009, paragraph 7.2.1.e)
X		Scan in progress indicator visible for any location from which a scan can be inititiated? (ANSI N43.17-2009, paragraph 7.2.1.a)

Y	N	*Requirement*
X		At least one lighted scan in progress indicator visible from the inspection zone? (ANSI N43.17-2009, paragraph 7.2.1.b)
X		X-ray emission terminates after a present time or exposure? (21 CFR 1020.31(j); ANSI N43.17-2009, paragraph 7.2.2.e)
X		Operators have a clear view of the scanning area? (21 CFR 1020.31(j); ANSI N43.17-2009, paragraph 7.2.1.f)
X		Tool or key required to open or remove access panels? (21 CFR 1020.31(j); ANSI N43.17-2009, paragraph 7.2.1.i)
NT		User provided with required information? (21 CFR 1020.31(j); ANSI N43.17-2009, paragraph 7.5)

NT=not tested; NA=not applicable.

SURVEY DIAGRAM



SCANNING MEASUREMENTS

Scanning below action levels? Yes [X] No [ ]

(If no, explain in comments)

Inspection zone boundary scanned with Instrument #3.

SCATTERED RADIATION

Location	*Scan 1*	*Scan 2*	*Scan 3*	*Average*
1	0.2 µR	0 µR	0 µR	0.07 µR
2	0.07 µR	0.07 µR	0.07 µR	0.07 µR
3	0 µR	0.07 µR	0.07 µR	0.05 µR
4	0.07 µR	0 µR	0.07 µR	0.05 µR

Measurements made with Instruments #1 & #2

DOSE PER SCREENING

	Exposure (X)	
Trial	*"Front" Side*	*"Back" Side*
a	5.64 µR	5.45 µR
b	5.71 µR	5.52 µR
c	5.63 µR	5.52 µR
d	5.58 µR	5.45 µR
e	5.71 µR	5.52 µR
AVG	5.65 µR	5.49 µR

Energy Correctin Factor 1.25

Reference Effective Dose per Screening (max 25 µrem)[1]:

2.1 µrem

or

0.021 µSv

RESULT **PASS**

Measurements made with Instruments #1 & #2

BEAM QUALITY

	Exposure (X)	
mm Al	*"Front" Side*	*"Back" Side*
0	1.00 µR	0.86 µR
0	1.00 µR	0.86 µR
1	0.63 µR	0.47 µR
1	0.50 µR	0.46 µR
1.5	0.37 µR	0.44 µR
1.5	0.40 µR	0.40 µR

HVL "Front" Side	**1.2**	mm Al
HVL "Back" Side	**1.4**	mm Al
Conversion Factor	**0.150**	
Min. Filtration[1]	**1.0**	**mm Al**

[1] An HVL of 1 mm Al corresonds to a filtration of 1 mm Al for this system

RESULT **PASS**

Measurements made with Instruments #1 & #2

COMMENTS AND RECOMMENDATIONS

* The WB Johnson TVX-2000 was response checked prior to the survey.

Survey Worksheet - AIT 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-0E7J-11
Survey Date	19 Jan 2011
Surveyor(s)	[redacted]

SURVEY LOCATION

Location	Terminal 1, Checkpoint 2, Lane 1, AIT # 5				
Organization	Chicago O'Hare International				
Street Address					
City/Installation	Chicago	State	IL	ZIP	

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	WB Johnson	TVX-2000	40174	*

SYSTEM INFORMATION

Manufacturer	*Model*	*Serial No.*	*Manuf. Date*
Rapiscan	Secure 1000SP	S51002012	Jan 2010

Certified	NA	***Place of Manufacture***	Torrance, CA
Service Provider Survey Date	Not Found		

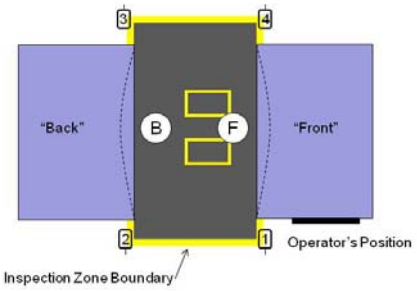
VISUAL INSPECTION

Y	N	*Requirement*
X		Key activated control with key capture? (21 CFR 1020.31(j); ANSI N43.17-2009, paragraph 7.2.1.c)
	X	"Caution: X-Rays Produced When Energized" label present at control to initiate scan? (21 CFR 1020.31(j); ANSI N43.17-2009, paragraph 7.2.2.d)
X		Technique factors preset for each mode of operation? (21 CFR 1020.31(j); ANSI N43.17-2009, paragraph 7.2.2.b)
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		Means to terminate emission of radiation other than an interlock? (ANSI N43.17-2009, paragraph 7.2.1.e)
X		Scan in progress indicator visible for any location from which a scan can be inititiated? (ANSI N43.17-2009, paragraph 7.2.1.a)

Y	N	*Requirement*
X		At least one lighted scan in progress indicator visible from the inspection zone? (ANSI N43.17-2009, paragraph 7.2.1.b)
X		X-ray emission terminates after a present time or exposure? (21 CFR 1020.31(j); ANSI N43.17-2009, paragraph 7.2.2.e)
X		Operators have a clear view of the scanning area? (21 CFR 1020.31(j); ANSI N43.17-2009, paragraph 7.2.1.f)
X		Tool or key required to open or remove access panels? (21 CFR 1020.31(j); ANSI N43.17-2009, paragraph 7.2.1.i)
NT		User provided with required information? (21 CFR 1020.31(j); ANSI N43.17-2009, paragraph 7.5)

NT=not tested; NA=not applicable.

SURVEY DIAGRAM



SCANNING MEASUREMENTS

Scanning below action levels? Yes [X] No [ ]
(If no, explain in comments)

Inspection zone boundary scanned with Instrument #3.

SCATTERED RADIATION

Location	*Scan 1*	*Scan 2*	*Scan 3*	*Average*
1	µR	µR	µR	µR
2	µR	µR	µR	µR
3	µR	µR	µR	µR
4	µR	µR	µR	µR

Measurements made with Instruments #1 & #2

DOSE PER SCREENING

	Exposure (X)			
Trial	*"Front" Side*		*"Back" Side*	
a	4.73	µR	5.42	µR
b	4.75	µR	5.02	µR
c	4.75	µR	4.96	µR
d	4.62	µR	4.95	µR
e	4.89	µR	4.89	µR
AVG	4.75	µR	5.05	µR

Energy Correctin Factor 1.25

Reference Effective Dose per Screening (max 25 µrem)[1]:

1.7 µrem

or

0.017 µSv

RESULT **PASS**

Measurements made with Instruments #1 & #2

BEAM QUALITY

	Exposure (X)			
mm Al	*"Front" Side*		*"Back" Side*	
0	0.87	µR	1.14	µR
0	0.87	µR	1.14	µR
1	0.54	µR	0.60	µR
1	0.47	µR	0.60	µR
1.5	0.40	µR	0.53	µR
1.5	0.34	µR	0.53	µR

HVL "Front" Side	1.2	mm Al
HVL "Back" Side	1.2	mm Al
Conversion Factor	0.136	
Min. Filtration[1]	1.0	**mm Al**

[1] An HVL of 1 mm Al corresonds to a filtration of 1 mm Al for this system

RESULT **PASS**

Measurements made with Instruments #1 & #2

COMMENTS AND RECOMMENDATIONS

Scattered radiation measurements were not performed since passengers were not being screened through this system.

* The WB Johnson TVX-2000 was response checked prior to the survey.

Survey Worksheet - AIT 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-0E7J-11
Survey Date	19 Jan 2011
Surveyor(s)	[redacted]

SURVEY LOCATION

Location	Terminal 1, Checkpoint 2, Lanes 2-3, AIT # 6				
Organization	Chicago O'Hare International				
Street Address					
City/Installation	Chicago	State	IL	ZIP	

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	WB Johnson	TVX-2000	40174	*

SYSTEM INFORMATION

Manufacturer	Model	Serial No.	Manuf. Date
Rapiscan	Secure 1000SP	S51002013	Jan 2010

Certified	NA	***Place of Manufacture***	Torrance, CA
Service Provider Survey Date	Not Found		

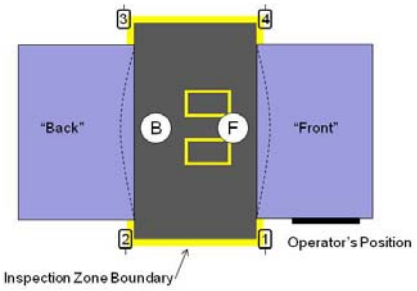
VISUAL INSPECTION

Y	N	Requirement
X		Key activated control with key capture? (21 CFR 1020.31(j); ANSI N43.17-2009, paragraph 7.2.1.c)
	X	"Caution: X-Rays Produced When Energized" label present at control to initiate scan? (21 CFR 1020.31(j); ANSI N43.17-2009, paragraph 7.2.2.d)
X		Technique factors preset for each mode of operation? (21 CFR 1020.31(j); ANSI N43.17-2009, paragraph 7.2.2.b)
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		Means to terminate emission of radiation other than an interlock? (ANSI N43.17-2009, paragraph 7.2.1.e)
X		Scan in progress indicator visible for any location from which a scan can be inititiated? (ANSI N43.17-2009, paragraph 7.2.1.a)

Y	N	Requirement
X		At least one lighted scan in progress indicator visible from the inspection zone? (ANSI N43.17-2009, paragraph 7.2.1.b)
X		X-ray emission terminates after a present time or exposure? (21 CFR 1020.31(j); ANSI N43.17-2009, paragraph 7.2.2.e)
X		Operators have a clear view of the scanning area? (21 CFR 1020.31(j); ANSI N43.17-2009, paragraph 7.2.1.f)
X		Tool or key required to open or remove access panels? (21 CFR 1020.31(j); ANSI N43.17-2009, paragraph 7.2.1.i)
NT		User provided with required information? (21 CFR 1020.31(j); ANSI N43.17-2009, paragraph 7.5)

NT=not tested; NA=not applicable.

SURVEY DIAGRAM



SCANNING MEASUREMENTS

Scanning below action levels? Yes [X] No [ ]
(If no, explain in comments)

Inspection zone boundary scanned with Instrument #3.

SCATTERED RADIATION

Location	Scan 1	Scan 2	Scan 3	Average
1	µR	µR	µR	µR
2	µR	µR	µR	µR
3	µR	µR	µR	µR
4	µR	µR	µR	µR

Measurements made with Instruments #1 & #2

DOSE PER SCREENING

	Exposure (X)			
Trial	"Front" Side		"Back" Side	
a	5.76	µR	5.56	µR
b	6.03	µR	5.69	µR
c	5.96	µR	5.62	µR
d	5.89	µR	5.69	µR
e	5.89	µR	5.56	µR
AVG	5.91	µR	5.62	µR

Energy Correctin Factor: 1.25

Reference Effective Dose per Screening (max 25 µrem)[1]:
1.8 µrem
or
0.018 µSv

RESULT PASS

Measurements made with Instruments #1 & #2

BEAM QUALITY

	Exposure (X)			
mm Al	"Front" Side		"Back" Side	
0	0.87	µR	0.94	µR
0	0.94	µR	0.94	µR
1	0.47	µR	0.53	µR
1	0.47	µR	0.47	µR
1.5	0.33	µR	0.40	µR
1.5	0.40	µR	0.40	µR

HVL "Front" Side	1.1	mm Al
HVL "Back" Side	1.1	mm Al
Conversion Factor	0.125	
Min. Filtration[1]	1.0	**mm Al**

[1] An HVL of 1 mm Al corresonds to a filtration of 1 mm Al for this system

RESULT PASS

Measurements made with Instruments #1 & #2

COMMENTS AND RECOMMENDATIONS

Scattered radiation measurements were not performed since passengers were not being screened through this system.

* The WB Johnson TVX-2000 was response checked prior to the survey.

Survey Worksheet - AIT 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-0E7J-11
Survey Date	19 Jan 2011
Surveyor(s)	[redacted]

SURVEY LOCATION

Location	Terminal 1, Checkpoint 2, Lanes 4-5, AIT # 7				
Organization	Chicago O'Hare International				
Street Address					
City/Installation	Chicago	State	IL	ZIP	

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	WB Johnson	TVX-2000	40174	*

SYSTEM INFORMATION

Manufacturer	Model	Serial No.	Manuf. Date
Rapiscan	Secure 1000SP	S51002014	Jan 2010

Certified	NA	***Place of Manufacture***	Torrance, CA
Service Provider Survey Date	Not Found		

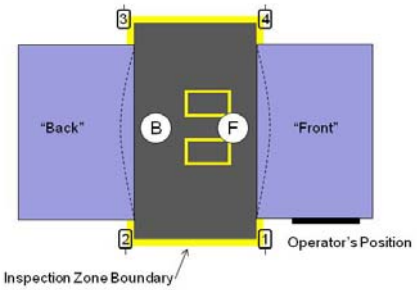
VISUAL INSPECTION

Y	N	Requirement
X		Key activated control with key capture? (21 CFR 1020.31(j); ANSI N43.17-2009, paragraph 7.2.1.c)
	X	"Caution: X-Rays Produced When Energized" label present at control to initiate scan? (21 CFR 1020.31(j); ANSI N43.17-2009, paragraph 7.2.2.d)
X		Technique factors preset for each mode of operation? (21 CFR 1020.31(j); ANSI N43.17-2009, paragraph 7.2.2.b)
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		Means to terminate emission of radiation other than an interlock? (ANSI N43.17-2009, paragraph 7.2.1.e)
X		Scan in progress indicator visible for any location from which a scan can be inititiated? (ANSI N43.17-2009, paragraph 7.2.1.a)

Y	N	Requirement
X		At least one lighted scan in progress indicator visible from the inspection zone? (ANSI N43.17-2009, paragraph 7.2.1.b)
X		X-ray emission terminates after a present time or exposure? (21 CFR 1020.31(j); ANSI N43.17-2009, paragraph 7.2.2.e)
X		Operators have a clear view of the scanning area? (21 CFR 1020.31(j); ANSI N43.17-2009, paragraph 7.2.1.f)
X		Tool or key required to open or remove access panels? (21 CFR 1020.31(j); ANSI N43.17-2009, paragraph 7.2.1.i)
NT		User provided with required information? (21 CFR 1020.31(j); ANSI N43.17-2009, paragraph 7.5)

NT=not tested; NA=not applicable.

SURVEY DIAGRAM



SCANNING MEASUREMENTS

Scanning below action levels? Yes [X] No [ ]
(If no, explain in comments)

Inspection zone boundary scanned with Instrument #3.

SCATTERED RADIATION

Location	Scan 1		Scan 2		Scan 3		Average	
1	0	µR	0	µR	0	µR	0.00	µR
2	0.13	µR	0.13	µR	0.13	µR	0.13	µR
3	0	µR	0	µR	0	µR	0.00	µR
4	0	µR	0	µR	0	µR	0.00	µR

Measurements made with Instruments #1 & #2

DOSE PER SCREENING

	Exposure (X)			
Trial	"Front" Side		"Back" Side	
a	6.49	µR	7.10	µR
b	6.36	µR	7.03	µR
c	6.36	µR	6.96	µR
d	6.43	µR	6.96	µR
e	6.49	µR	7.03	µR
AVG	6.43	µR	7.02	µR

Energy Correctin Factor 1.25

Reference Effective Dose per Screening (max 25 µrem)[1]:

2.8 µrem

or

0.028 µSv

RESULT **PASS**

Measurements made with Instruments #1 & #2

BEAM QUALITY

	Exposure (X)			
mm Al	"Front" Side		"Back" Side	
0	1.14	µR	1.14	µR
0	0.94	µR	1.14	µR
1	0.67	µR	0.67	µR
1	0.60	µR	0.67	µR
1.5	0.54	µR	0.53	µR
1.5	0.47	µR	0.53	µR

HVL "Front" Side	**1.4**	mm Al
HVL "Back" Side	**1.3**	mm Al
Conversion Factor	**0.157**	
Min. Filtration[1]	**1.0**	**mm Al**

[1] An HVL of 1 mm Al corresonds to a filtration of 1 mm Al for this system

RESULT **PASS**

Measurements made with Instruments #1 & #2

COMMENTS AND RECOMMENDATIONS

The "wing" on the "back" or slave unit at the entrance side (location 3 in the diagram above) was installed backwards. This does not affect radiation safety.

* The WB Johnson TVX-2000 was response checked prior to the survey.

Survey Worksheet - AIT 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-0E7J-11
Survey Date	19 Jan 2011
Surveyor(s)	[redacted]

SURVEY LOCATION

Location	Terminal 1, Checkpoint 2, Lanes 6-7, AIT # 8				
Organization	Chicago O'Hare International				
Street Address					
City/Installation	Chicago	State	IL	ZIP	

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	WB Johnson	TVX-2000	40174	*

SYSTEM INFORMATION

Manufacturer	Model	Serial No.	Manuf. Date
Rapiscan	Secure 1000SP	S51003001	Jan 2010

Certified	NA	***Place of Manufacture***	Torrance, CA
Service Provider Survey Date	Not Found		

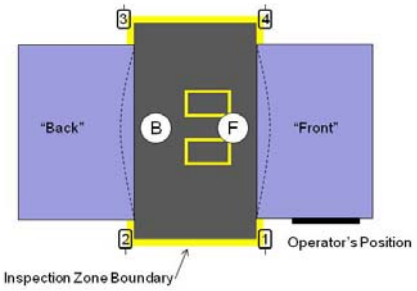
VISUAL INSPECTION

Y	N	Requirement
X		Key activated control with key capture? (21 CFR 1020.31(j); ANSI N43.17-2009, paragraph 7.2.1.c)
	X	"Caution: X-Rays Produced When Energized" label present at control to initiate scan? (21 CFR 1020.31(j); ANSI N43.17-2009, paragraph 7.2.2.d)
X		Technique factors preset for each mode of operation? (21 CFR 1020.31(j); ANSI N43.17-2009, paragraph 7.2.2.b)
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		Means to terminate emission of radiation other than an interlock? (ANSI N43.17-2009, paragraph 7.2.1.e)
X		Scan in progress indicator visible for any location from which a scan can be inititiated? (ANSI N43.17-2009, paragraph 7.2.1.a)

Y	N	Requirement
X		At least one lighted scan in progress indicator visible from the inspection zone? (ANSI N43.17-2009, paragraph 7.2.1.b)
X		X-ray emission terminates after a present time or exposure? (21 CFR 1020.31(j); ANSI N43.17-2009, paragraph 7.2.2.e)
X		Operators have a clear view of the scanning area? (21 CFR 1020.31(j); ANSI N43.17-2009, paragraph 7.2.1.f)
X		Tool or key required to open or remove access panels? (21 CFR 1020.31(j); ANSI N43.17-2009, paragraph 7.2.1.i)
NT		User provided with required information? (21 CFR 1020.31(j); ANSI N43.17-2009, paragraph 7.5)

NT=not tested; NA=not applicable.

SURVEY DIAGRAM



SCANNING MEASUREMENTS

Scanning below action levels? Yes [X] No [ ]
(If no, explain in comments)

Inspection zone boundary scanned with Instrument #3.

SCATTERED RADIATION

Location	Scan 1		Scan 2		Scan 3		Average	
1	0	µR	0	µR	0	µR	0.00	µR
2	0	µR	0.07	µR	0	µR	0.02	µR
3	0	µR	0	µR	0	µR	0.00	µR
4	0	µR	0	µR	0	µR	0.00	µR

Measurements made with Instruments #1 & #2

DOSE PER SCREENING

	Exposure (X)			
Trial	"Front" Side		"Back" Side	
a	5.56	µR	6.16	µR
b	5.56	µR	6.09	µR
c	5.63	µR	6.03	µR
d	5.70	µR	6.10	µR
e	5.76	µR	6.03	µR
AVG	5.64	µR	6.08	µR

Energy Correctin Factor 1.25

Reference Effective Dose per Screening (max 25 µrem)[1]:
2.2 µrem
or
0.022 µSv

RESULT **PASS**

Measurements made with Instruments #1 & #2

BEAM QUALITY

	Exposure (X)			
mm Al	"Front" Side		"Back" Side	
0	0.94	µR	1.34	µR
0	1.07	µR	1.27	µR
1	0.60	µR	0.73	µR
1	0.54	µR	0.73	µR
1.5	0.47	µR	0.60	µR
1.5	0.47	µR	0.53	µR

HVL "Front" Side	1.3	mm Al
HVL "Back" Side	1.2	mm Al
Conversion Factor	0.146	
Min. Filtration[1]	1.0	**mm Al**

[1] An HVL of 1 mm Al corresonds to a filtration of 1 mm Al for this system

RESULT **PASS**

Measurements made with Instruments #1 & #2

COMMENTS AND RECOMMENDATIONS

* The WB Johnson TVX-2000 was response checked prior to the survey.

Survey Worksheet - AIT 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-0E7J-11
Survey Date	19 Jan 2011
Surveyor(s)	[redacted]

SURVEY LOCATION

Location	Terminal 1, Checkpoint 2, Lanes 8-9, AIT # 9				
Organization	Chicago O'Hare International				
Street Address					
City/Installation	Chicago	State	IL	ZIP	

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	WB Johnson	TVX-2000	40174	*

SYSTEM INFORMATION

Manufacturer	Model	Serial No.	Manuf. Date
Rapiscan	Secure 1000SP	S51003002	Jan 2010

Certified	NA	***Place of Manufacture***	Torrance, CA
Service Provider Survey Date	Not Found		

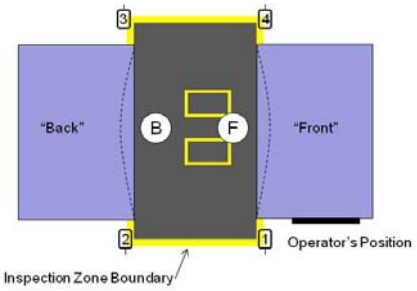
VISUAL INSPECTION

Y	N	Requirement
X		Key activated control with key capture? (21 CFR 1020.31(j); ANSI N43.17-2009, paragraph 7.2.1.c)
	X	"Caution: X-Rays Produced When Energized" label present at control to initiate scan? (21 CFR 1020.31(j); ANSI N43.17-2009, paragraph 7.2.2.d)
X		Technique factors preset for each mode of operation? (21 CFR 1020.31(j); ANSI N43.17-2009, paragraph 7.2.2.b)
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		Means to terminate emission of radiation other than an interlock? (ANSI N43.17-2009, paragraph 7.2.1.e)
X		Scan in progress indicator visible for any location from which a scan can be inititiated? (ANSI N43.17-2009, paragraph 7.2.1.a)

Y	N	Requirement
X		At least one lighted scan in progress indicator visible from the inspection zone? (ANSI N43.17-2009, paragraph 7.2.1.b)
X		X-ray emission terminates after a present time or exposure? (21 CFR 1020.31(j); ANSI N43.17-2009, paragraph 7.2.2.e)
X		Operators have a clear view of the scanning area? (21 CFR 1020.31(j); ANSI N43.17-2009, paragraph 7.2.1.f)
X		Tool or key required to open or remove access panels? (21 CFR 1020.31(j); ANSI N43.17-2009, paragraph 7.2.1.i)
NT		User provided with required information? (21 CFR 1020.31(j); ANSI N43.17-2009, paragraph 7.5)

NT=not tested; NA=not applicable.

SURVEY DIAGRAM



SCANNING MEASUREMENTS

Scanning below action levels? Yes [X] No [ ]
(If no, explain in comments)

Inspection zone boundary scanned with Instrument #3.

SCATTERED RADIATION

Location	Scan 1		Scan 2		Scan 3		Average	
1	0	µR	0	µR	0	µR	0.00	µR
2	0	µR	0	µR	0	µR	0.00	µR
3	0	µR	0.06	µR	0	µR	0.02	µR
4	0	µR	0	µR	0	µR	0.00	µR

Measurements made with Instruments #1 & #2

DOSE PER SCREENING

	Exposure (X)			
Trial	"Front" Side		"Back" Side	
a	5.63	µR	5.76	µR
b	5.76	µR	5.63	µR
c	5.62	µR	5.69	µR
d	5.69	µR	5.69	µR
e	5.76	µR	5.63	µR
AVG	5.69	µR	5.68	µR

Energy Correctin Factor: 1.25

Reference Effective Dose per Screening (max 25 µrem)[1]:
2.0 µrem
or
0.020 µSv

RESULT PASS

Measurements made with Instruments #1 & #2

BEAM QUALITY

	Exposure (X)			
mm Al	"Front" Side		"Back" Side	
0	0.87	µR	1.14	µR
0	0.80	µR	1.07	µR
1	0.47	µR	0.60	µR
1	0.47	µR	0.60	µR
1.5	0.40	µR	0.47	µR
1.5	0.34	µR	0.47	µR

HVL "Front" Side	1.2	mm Al
HVL "Back" Side	1.2	mm Al
Conversion Factor	0.137	
Min. Filtration[1]	1.0	**mm Al**

[1] An HVL of 1 mm Al corresonds to a filtration of 1 mm Al for this system

RESULT PASS

Measurements made with Instruments #1 & #2

COMMENTS AND RECOMMENDATIONS

* The WB Johnson TVX-2000 was response checked prior to the survey.

Survey Worksheet - AIT 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-0E7J-11
Survey Date	19 Jan 2011
Surveyor(s)	[redacted]

SURVEY LOCATION

Location	Terminal 1, Checkpoint 3, Lanes 1-2, AIT # 10				
Organization	Chicago O'Hare International				
Street Address					
City/Installation	Chicago	State	IL	ZIP	

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	WB Johnson	TVX-2000	40174	*

SYSTEM INFORMATION

Manufacturer	*Model*	*Serial No.*	*Manuf. Date*
Rapiscan	Secure 1000SP	S51002002	Jan 2010

Certified	NA	***Place of Manufacture***	Torrance, CA
Service Provider Survey Date	14 May 2010		

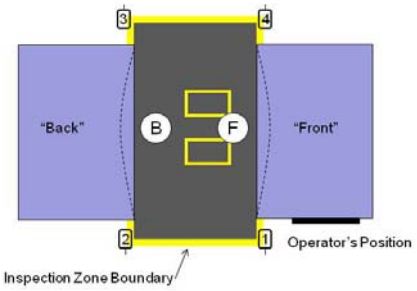
VISUAL INSPECTION

Y	N	*Requirement*
X		Key activated control with key capture? (21 CFR 1020.31(j); ANSI N43.17-2009, paragraph 7.2.1.c)
	X	"Caution: X-Rays Produced When Energized" label present at control to initiate scan? (21 CFR 1020.31(j); ANSI N43.17-2009, paragraph 7.2.2.d)
X		Technique factors preset for each mode of operation? (21 CFR 1020.31(j); ANSI N43.17-2009, paragraph 7.2.2.b)
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		Means to terminate emission of radiation other than an interlock? (ANSI N43.17-2009, paragraph 7.2.1.e)
X		Scan in progress indicator visible for any location from which a scan can be inititiated? (ANSI N43.17-2009, paragraph 7.2.1.a)

Y	N	*Requirement*
X		At least one lighted scan in progress indicator visible from the inspection zone? (ANSI N43.17-2009, paragraph 7.2.1.b)
X		X-ray emission terminates after a present time or exposure? (21 CFR 1020.31(j); ANSI N43.17-2009, paragraph 7.2.2.e)
X		Operators have a clear view of the scanning area? (21 CFR 1020.31(j); ANSI N43.17-2009, paragraph 7.2.1.f)
X		Tool or key required to open or remove access panels? (21 CFR 1020.31(j); ANSI N43.17-2009, paragraph 7.2.1.i)
NT		User provided with required information? (21 CFR 1020.31(j); ANSI N43.17-2009, paragraph 7.5)

NT=not tested; NA=not applicable.

SURVEY DIAGRAM



SCANNING MEASUREMENTS

Scanning below action levels? Yes [X] No [ ]
(If no, explain in comments)

Inspection zone boundary scanned with Instrument #3.

SCATTERED RADIATION

Location	*Scan 1*	*Scan 2*	*Scan 3*	*Average*
1	µR	µR	µR	µR
2	µR	µR	µR	µR
3	µR	µR	µR	µR
4	µR	µR	µR	µR

Measurements made with Instruments #1 & #2

DOSE PER SCREENING

	Exposure (X)			
Trial	*"Front" Side*		*"Back" Side*	
a	5.70	µR	6.24	µR
b	5.70	µR	6.24	µR
c	5.70	µR	6.24	µR
d	5.64	µR	6.44	µR
e	5.64	µR	6.17	µR
AVG	5.68	µR	6.27	µR

Energy Correctin Factor 1.25

Reference Effective Dose per Screening (max 25 µrem)[1]:

2.3 µrem

or

0.023 µSv

RESULT **PASS**

Measurements made with Instruments #1 & #2

BEAM QUALITY

	Exposure (X)			
mm Al	*"Front" Side*		*"Back" Side*	
0	1.34	µR	1.54	µR
0	1.27	µR	1.68	µR
1	0.74	µR	0.93	µR
1	0.67	µR	0.87	µR
1.5	0.60	µR	0.80	µR
1.5	0.54	µR	0.74	µR

HVL "Front" Side	**1.2**	mm Al
HVL "Back" Side	**1.4**	mm Al
Conversion Factor	**0.149**	
Min. Filtration[1]	**1.0**	**mm Al**

[1] An HVL of 1 mm Al corresonds to a filtration of 1 mm Al for this system

RESULT **PASS**

Measurements made with Instruments #1 & #2

COMMENTS AND RECOMMENDATIONS

Scattered radiation measurements were not performed due to the low volume of passengers at this checkpoint.

* The WB Johnson TVX-2000 was response checked prior to the survey.

Survey Worksheet - AIT 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-0E7J-11
Survey Date	19 Jan 2011
Surveyor(s)	[redacted]

SURVEY LOCATION

Location	Terminal 1, Checkpoint 3, Lanes 3-4, AIT # 11				
Organization	Chicago O'Hare International				
Street Address					
City/Installation	Chicago	State	IL	ZIP	

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	WB Johnson	TVX-2000	40174	*

SYSTEM INFORMATION

Manufacturer	Model	Serial No.	Manuf. Date
Rapiscan	Secure 1000SP	S50952007	Dec 2009

Certified	NA	***Place of Manufacture***	Torrance, CA
Service Provider Survey Date	10 Dec 2010		

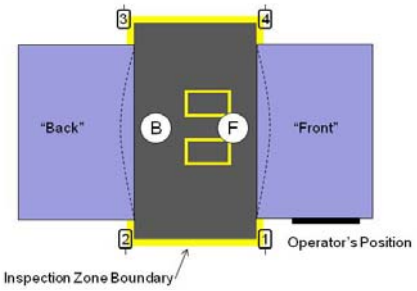
VISUAL INSPECTION

Y	N	Requirement
X		Key activated control with key capture? (21 CFR 1020.31(j); ANSI N43.17-2009, paragraph 7.2.1.c)
	X	"Caution: X-Rays Produced When Energized" label present at control to initiate scan? (21 CFR 1020.31(j); ANSI N43.17-2009, paragraph 7.2.2.d)
X		Technique factors preset for each mode of operation? (21 CFR 1020.31(j); ANSI N43.17-2009, paragraph 7.2.2.b)
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		Means to terminate emission of radiation other than an interlock? (ANSI N43.17-2009, paragraph 7.2.1.e)
X		Scan in progress indicator visible for any location from which a scan can be inititiated? (ANSI N43.17-2009, paragraph 7.2.1.a)

Y	N	Requirement
X		At least one lighted scan in progress indicator visible from the inspection zone? (ANSI N43.17-2009, paragraph 7.2.1.b)
X		X-ray emission terminates after a present time or exposure? (21 CFR 1020.31(j); ANSI N43.17-2009, paragraph 7.2.2.e)
X		Operators have a clear view of the scanning area? (21 CFR 1020.31(j); ANSI N43.17-2009, paragraph 7.2.1.f)
X		Tool or key required to open or remove access panels? (21 CFR 1020.31(j); ANSI N43.17-2009, paragraph 7.2.1.i)
NT		User provided with required information? (21 CFR 1020.31(j); ANSI N43.17-2009, paragraph 7.5)

NT=not tested; NA=not applicable.

SURVEY DIAGRAM



SCANNING MEASUREMENTS

Scanning below action levels? Yes [X] No [ ]
(If no, explain in comments)

Inspection zone boundary scanned with Instrument #3.

SCATTERED RADIATION

Location	Scan 1		Scan 2		Scan 3		Average	
1		µR		µR		µR		µR
2		µR		µR		µR		µR
3		µR		µR		µR		µR
4		µR		µR		µR		µR

Measurements made with Instruments #1 & #2

DOSE PER SCREENING

	Exposure (X)			
Trial	"Front" Side		"Back" Side	
a	6.00	µR	7.07	µR
b	6.07	µR	6.87	µR
c	5.87	µR	6.81	µR
d	5.80	µR	6.94	µR
e	6.01	µR	6.88	µR
AVG	5.95	µR	6.91	µR

Energy Correctin Factor 1.25

Reference Effective Dose per Screening (max 25 µrem)[1]:

2.1 µrem

or

0.021 µSv

RESULT **PASS**

Measurements made with Instruments #1 & #2

BEAM QUALITY

	Exposure (X)			
mm Al	"Front" Side		"Back" Side	
0	1.20	µR	1.67	µR
0	1.14	µR	1.67	µR
1	0.60	µR	0.87	µR
1	0.60	µR	0.86	µR
1.5	0.53	µR	0.73	µR
1.5	0.47	µR	0.73	µR

HVL "Front" Side	1.1	mm Al
HVL "Back" Side	1.1	mm Al
Conversion Factor	0.121	
Min. Filtration[1]	1.0	**mm Al**

[1] An HVL of 1 mm Al corresonds to a filtration of 1 mm Al for this system

RESULT **PASS**

Measurements made with Instruments #1 & #2

COMMENTS AND RECOMMENDATIONS

Scattered radiation measurements were not performed due to the low volume of passengers at this checkpoint.

* The WB Johnson TVX-2000 was response checked prior to the survey.

Survey Worksheet - AIT 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-0E7J-11
Survey Date	20 Jan 2011
Surveyor(s)	[redacted]

SURVEY LOCATION

Location	Terminal 2, Checkpoint 4, Lanes 1-2, AIT # 12				
Organization	Chicago O'Hare International				
Street Address					
City/Installation	Chicago	State	IL	ZIP	

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	WB Johnson	TVX-2000	40174	*

SYSTEM INFORMATION

Manufacturer	Model	Serial No.	Manuf. Date
Rapiscan	Secure 1000SP	S51002006	Jan 2010

Certified	NA	***Place of Manufacture***	Torrance, CA
Service Provider Survey Date	10 Dec 2010		

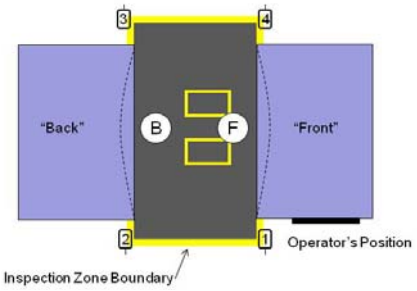
VISUAL INSPECTION

Y	N	Requirement
X		Key activated control with key capture? (21 CFR 1020.31(j); ANSI N43.17-2009, paragraph 7.2.1.c)
	X	"Caution: X-Rays Produced When Energized" label present at control to initiate scan? (21 CFR 1020.31(j); ANSI N43.17-2009, paragraph 7.2.2.d)
X		Technique factors preset for each mode of operation? (21 CFR 1020.31(j); ANSI N43.17-2009, paragraph 7.2.2.b)
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		Means to terminate emission of radiation other than an interlock? (ANSI N43.17-2009, paragraph 7.2.1.e)
X		Scan in progress indicator visible for any location from which a scan can be inititiated? (ANSI N43.17-2009, paragraph 7.2.1.a)

Y	N	Requirement
X		At least one lighted scan in progress indicator visible from the inspection zone? (ANSI N43.17-2009, paragraph 7.2.1.b)
X		X-ray emission terminates after a present time or exposure? (21 CFR 1020.31(j); ANSI N43.17-2009, paragraph 7.2.2.e)
X		Operators have a clear view of the scanning area? (21 CFR 1020.31(j); ANSI N43.17-2009, paragraph 7.2.1.f)
X		Tool or key required to open or remove access panels? (21 CFR 1020.31(j); ANSI N43.17-2009, paragraph 7.2.1.i)
NT		User provided with required information? (21 CFR 1020.31(j); ANSI N43.17-2009, paragraph 7.5)

NT=not tested; NA=not applicable.

SURVEY DIAGRAM



SCANNING MEASUREMENTS

Scanning below action levels? Yes [X] No [ ]
(If no, explain in comments)

Inspection zone boundary scanned with Instrument #3.

SCATTERED RADIATION

Location	Scan 1	Scan 2	Scan 3	Average
1	µR	µR	µR	µR
2	µR	µR	µR	µR
3	µR	µR	µR	µR
4	µR	µR	µR	µR

Measurements made with Instruments #1 & #2

DOSE PER SCREENING

	Exposure (X)			
Trial	"Front" Side		"Back" Side	
a	6.60	µR	5.81	µR
b	6.40	µR	5.81	µR
c	6.40	µR	5.80	µR
d	6.27	µR	5.87	µR
e	6.27	µR	5.67	µR
AVG	6.39	µR	5.79	µR

Energy Correctin Factor 1.25

Reference Effective Dose per Screening (max 25 µrem)[1]:
1.9 µrem
or
0.019 µSv

RESULT **PASS**

Measurements made with Instruments #1 & #2

BEAM QUALITY

	Exposure (X)			
mm Al	"Front" Side		"Back" Side	
0	1.33	µR	1.00	µR
0	1.27	µR	1.00	µR
1	0.67	µR	0.47	µR
1	0.67	µR	0.54	µR
1.5	0.53	µR	0.46	µR
1.5	0.53	µR	0.47	µR

HVL "Front" Side	1.1	mm Al
HVL "Back" Side	1.1	mm Al
Conversion Factor	0.118	
Min. Filtration[1]	1.0	**mm Al**

[1] An HVL of 1 mm Al corresonds to a filtration of 1 mm Al for this system

RESULT **PASS**

Measurements made with Instruments #1 & #2

COMMENTS AND RECOMMENDATIONS

Scattered radiation measurements were not performed since passengers were not being screened through this system.

* The WB Johnson TVX-2000 was response checked prior to the survey.

Survey Worksheet - AIT 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-0E7J-11
Survey Date	20 Jan 2011
Surveyor(s)	[redacted]

SURVEY LOCATION

Location	Terminal 2, Checkpoint 5, Lanes 1-2, AIT # 13				
Organization	Chicago O'Hare International				
Street Address					
City/Installation	Chicago	State	IL	ZIP	

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	WB Johnson	TVX-2000	40174	*

SYSTEM INFORMATION

Manufacturer	Model	Serial No.	Manuf. Date
Rapiscan	Secure 1000SP	S51002011	Jan 2010

Certified	NA	***Place of Manufacture***	Torrance, CA
Service Provider Survey Date	Not Found		

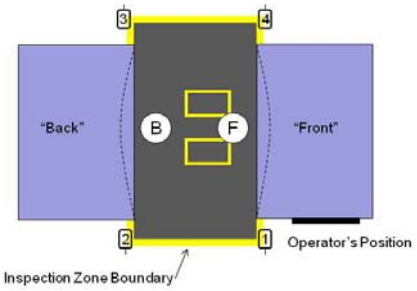
VISUAL INSPECTION

Y	N	Requirement
X		Key activated control with key capture? (21 CFR 1020.31(j); ANSI N43.17-2009, paragraph 7.2.1.c)
	X	"Caution: X-Rays Produced When Energized" label present at control to initiate scan? (21 CFR 1020.31(j); ANSI N43.17-2009, paragraph 7.2.2.d)
X		Technique factors preset for each mode of operation? (21 CFR 1020.31(j); ANSI N43.17-2009, paragraph 7.2.2.b)
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		Means to terminate emission of radiation other than an interlock? (ANSI N43.17-2009, paragraph 7.2.1.e)
X		Scan in progress indicator visible for any location from which a scan can be inititiated? (ANSI N43.17-2009, paragraph 7.2.1.a)

Y	N	Requirement
X		At least one lighted scan in progress indicator visible from the inspection zone? (ANSI N43.17-2009, paragraph 7.2.1.b)
X		X-ray emission terminates after a present time or exposure? (21 CFR 1020.31(j); ANSI N43.17-2009, paragraph 7.2.2.e)
X		Operators have a clear view of the scanning area? (21 CFR 1020.31(j); ANSI N43.17-2009, paragraph 7.2.1.f)
X		Tool or key required to open or remove access panels? (21 CFR 1020.31(j); ANSI N43.17-2009, paragraph 7.2.1.i)
NT		User provided with required information? (21 CFR 1020.31(j); ANSI N43.17-2009, paragraph 7.5)

NT=not tested; NA=not applicable.

SURVEY DIAGRAM



SCANNING MEASUREMENTS

Scanning below action levels? Yes [X] No [ ]
(If no, explain in comments)

Inspection zone boundary scanned with Instrument #3.

SCATTERED RADIATION

Location	Scan 1		Scan 2		Scan 3		Average	
1	0	µR	0	µR	0	µR	0.00	µR
2	0	µR	0	µR	0	µR	0.00	µR
3	0	µR	0.07	µR	0	µR	0.02	µR
4	0	µR	0	µR	0	µR	0.00	µR

Measurements made with Instruments #1 & #2

DOSE PER SCREENING

	Exposure (X)			
Trial	"Front" Side		"Back" Side	
a	5.26	µR	5.26	µR
b	4.99	µR	5.06	µR
c	5.12	µR	4.99	µR
d	5.26	µR	5.19	µR
e	5.25	µR	5.13	µR
AVG	5.18	µR	5.13	µR

Energy Correctin Factor 1.25

Reference Effective Dose per Screening (max 25 µrem)[1]:
2.0 µrem
or
0.020 µSv

RESULT **PASS**

Measurements made with Instruments #1 & #2

BEAM QUALITY

	Exposure (X)			
mm Al	"Front" Side		"Back" Side	
0		µR		µR
0		µR		µR
1		µR		µR
1		µR		µR
1.5		µR		µR
1.5		µR		µR

HVL "Front" Side		mm Al
HVL "Back" Side		mm Al
Conversion Factor	**0.154**	
Min. Filtration[1]	**1.0**	**mm Al**

[1] An HVL of 1 mm Al corresonds to a filtration of 1 mm Al for this system

RESULT

Measurements made with Instruments #1 & #2

COMMENTS AND RECOMMENDATIONS

Due to the low output of this system, the beam quality measurement could not be performed. A half-value layer of 1.4 mm Al (the maximum value for all systems tested at Chicago O'Hare International) was used to determine the dose conversion factor.

* The WB Johnson TVX-2000 was response checked prior to the survey.

Survey Worksheet - AIT 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-0E7J-11
Survey Date	20 Jan 2011
Surveyor(s)	[redacted]

SURVEY LOCATION

Location	Terminal 3, Checkpoint 6, Lanes 1-2, AIT # 14				
Organization	Chicago O'Hare International				
Street Address					
City/Installation	Chicago	State	IL	ZIP	

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	WB Johnson	TVX-2000	40174	*

SYSTEM INFORMATION

Manufacturer	*Model*	*Serial No.*	*Manuf. Date*
Rapiscan	Secure 1000SP	S51002010	Jan 2010

Certified	NA	***Place of Manufacture***	Torrance, CA
Service Provider Survey Date	Not Found		

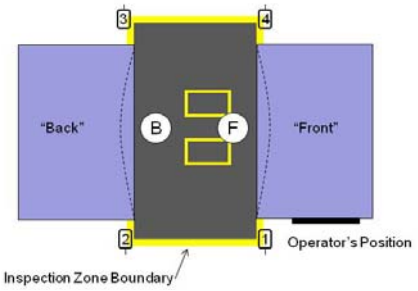
VISUAL INSPECTION

Y	N	*Requirement*
X		Key activated control with key capture? (21 CFR 1020.31(j); ANSI N43.17-2009, paragraph 7.2.1.c)
	X	"Caution: X-Rays Produced When Energized" label present at control to initiate scan? (21 CFR 1020.31(j); ANSI N43.17-2009, paragraph 7.2.2.d)
X		Technique factors preset for each mode of operation? (21 CFR 1020.31(j); ANSI N43.17-2009, paragraph 7.2.2.b)
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		Means to terminate emission of radiation other than an interlock? (ANSI N43.17-2009, paragraph 7.2.1.e)
X		Scan in progress indicator visible for any location from which a scan can be inititiated? (ANSI N43.17-2009, paragraph 7.2.1.a)

Y	N	*Requirement*
X		At least one lighted scan in progress indicator visible from the inspection zone? (ANSI N43.17-2009, paragraph 7.2.1.b)
X		X-ray emission terminates after a present time or exposure? (21 CFR 1020.31(j); ANSI N43.17-2009, paragraph 7.2.2.e)
X		Operators have a clear view of the scanning area? (21 CFR 1020.31(j); ANSI N43.17-2009, paragraph 7.2.1.f)
X		Tool or key required to open or remove access panels? (21 CFR 1020.31(j); ANSI N43.17-2009, paragraph 7.2.1.i)
NT		User provided with required information? (21 CFR 1020.31(j); ANSI N43.17-2009, paragraph 7.5)

NT=not tested; NA=not applicable.

SURVEY DIAGRAM



SCANNING MEASUREMENTS

Scanning below action levels? Yes [X] No [ ]
(If no, explain in comments)

Inspection zone boundary scanned with Instrument #3.

SCATTERED RADIATION

Location	*Scan 1*		*Scan 2*		*Scan 3*		*Average*	
1	0	µR	0	µR	0	µR	0.00	µR
2	0	µR	0	µR	0	µR	0.00	µR
3	0	µR	0	µR	0	µR	0.00	µR
4	0	µR	0	µR	0	µR	0.00	µR

Measurements made with Instruments #1 & #2

DOSE PER SCREENING

	Exposure (X)			
Trial	*"Front" Side*		*"Back" Side*	
a	3.83	µR	5.08	µR
b	4.40	µR	5.08	µR
c	4.55	µR	4.88	µR
d	4.55	µR	4.95	µR
e	4.55	µR	4.95	µR
AVG	4.38	µR	4.99	µR

Energy Correctin Factor 1.25

Reference Effective Dose per Screening (max 25 µrem)[1]:

1.9 µrem

or

0.019 µSv

RESULT **PASS**

Measurements made with Instruments #1 & #2

BEAM QUALITY

	Exposure (X)			
mm Al	*"Front" Side*		*"Back" Side*	
0		µR	0.92	µR
0		µR	0.99	µR
1		µR	0.53	µR
1		µR	0.53	µR
1.5		µR	0.46	µR
1.5		µR	0.46	µR

HVL "Front" Side		mm Al
HVL "Back" Side	**1.4**	mm Al
Conversion Factor	**0.154**	
Min. Filtration[1]	**1.0**	**mm Al**

[1] An HVL of 1 mm Al corresonds to a filtration of 1 mm Al for this system

RESULT

Measurements made with Instruments #1 & #2

COMMENTS AND RECOMMENDATIONS

Due to the low output of this system, the beam quality measurement could only be performed on the "Back" side. Since the HVL for the "back" side was equal to the maximum value for all systems tested at Chicago O'Hare International, this value was used to determine the dose conversion factor.

* The WB Johnson TVX-2000 was response checked prior to the survey.

Survey Worksheet - AIT 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-0E7J-11
Survey Date	20 Jan 2011
Surveyor(s)	[redacted]

SURVEY LOCATION

Location	Terminal 3, Checkpoint 7, Lanes 1-2, AIT # 15				
Organization	Chicago O'Hare International				
Street Address					
City/Installation	Chicago	State	IL	ZIP	

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	WB Johnson	TVX-2000	40174	*

SYSTEM INFORMATION

Manufacturer	Model	Serial No.	Manuf. Date
Rapiscan	Secure 1000SP	S50950005	Dec 2009

Certified	NA	***Place of Manufacture***	Torrance, CA
Service Provider Survey Date	30 Apr 2010		

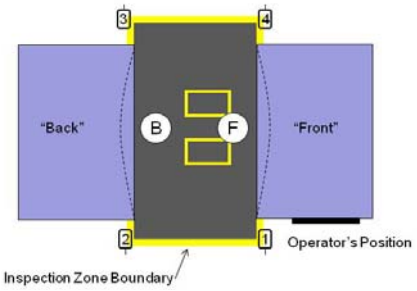
VISUAL INSPECTION

Y	N	Requirement
X		Key activated control with key capture? (21 CFR 1020.31(j); ANSI N43.17-2009, paragraph 7.2.1.c)
	X	"Caution: X-Rays Produced When Energized" label present at control to initiate scan? (21 CFR 1020.31(j); ANSI N43.17-2009, paragraph 7.2.2.d)
X		Technique factors preset for each mode of operation? (21 CFR 1020.31(j); ANSI N43.17-2009, paragraph 7.2.2.b)
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		Means to terminate emission of radiation other than an interlock? (ANSI N43.17-2009, paragraph 7.2.1.e)
X		Scan in progress indicator visible for any location from which a scan can be inititiated? (ANSI N43.17-2009, paragraph 7.2.1.a)

Y	N	Requirement
X		At least one lighted scan in progress indicator visible from the inspection zone? (ANSI N43.17-2009, paragraph 7.2.1.b)
X		X-ray emission terminates after a present time or exposure? (21 CFR 1020.31(j); ANSI N43.17-2009, paragraph 7.2.2.e)
X		Operators have a clear view of the scanning area? (21 CFR 1020.31(j); ANSI N43.17-2009, paragraph 7.2.1.f)
X		Tool or key required to open or remove access panels? (21 CFR 1020.31(j); ANSI N43.17-2009, paragraph 7.2.1.i)
NT		User provided with required information? (21 CFR 1020.31(j); ANSI N43.17-2009, paragraph 7.5)

NT=not tested; NA=not applicable.

SURVEY DIAGRAM



SCANNING MEASUREMENTS

Scanning below action levels? Yes [X] No [ ]
(If no, explain in comments)

Inspection zone boundary scanned with Instrument #3.

SCATTERED RADIATION

Location	Scan 1		Scan 2		Scan 3		Average	
1		µR		µR		µR		µR
2		µR		µR		µR		µR
3		µR		µR		µR		µR
4		µR		µR		µR		µR

Measurements made with Instruments #1 & #2

DOSE PER SCREENING

	Exposure (X)			
Trial	"Front" Side		"Back" Side	
a	5.46	µR	5.87	µR
b	5.47	µR	5.73	µR
c	5.66	µR	5.74	µR
d	5.60	µR	5.74	µR
e	5.67	µR	5.67	µR
AVG	5.57	µR	5.75	µR

Energy Correctin Factor 1.25

Reference Effective Dose per Screening (max 25 µrem)[1]:
2.0 µrem
or
0.020 µSv

RESULT **PASS**

Measurements made with Instruments #1 & #2

BEAM QUALITY

	Exposure (X)			
mm Al	"Front" Side		"Back" Side	
0	1.32	µR	0.99	µR
0	1.29	µR	0.99	µR
1	0.73	µR	0.53	µR
1	0.66	µR	0.53	µR
1.5	0.53	µR	0.46	µR
1.5	0.53	µR	0.46	µR

HVL "Front" Side	1.1	mm Al
HVL "Back" Side	1.2	mm Al
Conversion Factor	0.137	
Min. Filtration[1]	1.0	**mm Al**

[1] An HVL of 1 mm Al corresonds to a filtration of 1 mm Al for this system

RESULT **PASS**

Measurements made with Instruments #1 & #2

COMMENTS AND RECOMMENDATIONS

Scattered radiation measurements were not performed since passengers were not being screened through this system at the time of the survey.

* The WB Johnson TVX-2000 was response checked prior to the survey.

Survey Worksheet - AIT 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-0E7J-11
Survey Date	20 Jan 2011
Surveyor(s)	[redacted]

SURVEY LOCATION

Location	Terminal 3, Checkpoint 7, Lanes 3-4, AIT # 16				
Organization	Chicago O'Hare International				
Street Address					
City/Installation	Chicago	State	IL	ZIP	

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	WB Johnson	TVX-2000	40174	*

SYSTEM INFORMATION

Manufacturer	*Model*	*Serial No.*	*Manuf. Date*
Rapiscan	Secure 1000SP	S50950004	Dec 2009

Certified	NA	***Place of Manufacture***	Torrance, CA
Service Provider Survey Date	6 May 2010		

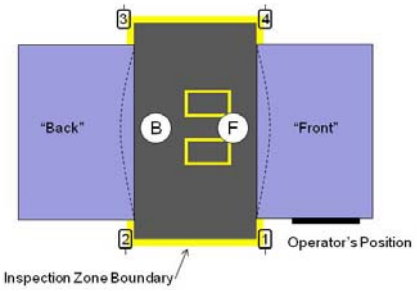
VISUAL INSPECTION

Y	N	*Requirement*
X		Key activated control with key capture? (21 CFR 1020.31(j); ANSI N43.17-2009, paragraph 7.2.1.c)
	X	"Caution: X-Rays Produced When Energized" label present at control to initiate scan? (21 CFR 1020.31(j); ANSI N43.17-2009, paragraph 7.2.2.d)
X		Technique factors preset for each mode of operation? (21 CFR 1020.31(j); ANSI N43.17-2009, paragraph 7.2.2.b)
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		Means to terminate emission of radiation other than an interlock? (ANSI N43.17-2009, paragraph 7.2.1.e)
X		Scan in progress indicator visible for any location from which a scan can be inititiated? (ANSI N43.17-2009, paragraph 7.2.1.a)

Y	N	*Requirement*
X		At least one lighted scan in progress indicator visible from the inspection zone? (ANSI N43.17-2009, paragraph 7.2.1.b)
X		X-ray emission terminates after a present time or exposure? (21 CFR 1020.31(j); ANSI N43.17-2009, paragraph 7.2.2.e)
X		Operators have a clear view of the scanning area? (21 CFR 1020.31(j); ANSI N43.17-2009, paragraph 7.2.1.f)
X		Tool or key required to open or remove access panels? (21 CFR 1020.31(j); ANSI N43.17-2009, paragraph 7.2.1.i)
NT		User provided with required information? (21 CFR 1020.31(j); ANSI N43.17-2009, paragraph 7.5)

NT=not tested; NA=not applicable.

SURVEY DIAGRAM



SCANNING MEASUREMENTS

Scanning below action levels? Yes [X] No [ ]
(If no, explain in comments)

Inspection zone boundary scanned with Instrument #3.

SCATTERED RADIATION

Location	*Scan 1*	*Scan 2*	*Scan 3*	*Average*
1	µR	µR	µR	µR
2	µR	µR	µR	µR
3	µR	µR	µR	µR
4	µR	µR	µR	µR

Measurements made with Instruments #1 & #2

DOSE PER SCREENING

	Exposure (X)			
Trial	*"Front" Side*		*"Back" Side*	
a	6.43	µR	6.77	µR
b	6.36	µR	6.56	µR
c	6.49	µR	6.57	µR
d	6.36	µR	6.57	µR
e	6.36	µR	6.56	µR
AVG	6.40	µR	6.61	µR

Energy Correctin Factor 1.25

Reference Effective Dose per Screening (max 25 µrem)[1]:
2.2 µrem
or
0.022 µSv

RESULT **PASS**

Measurements made with Instruments #1 & #2

BEAM QUALITY

	Exposure (X)			
mm Al	*"Front" Side*		*"Back" Side*	
0	1.34	µR	1.14	µR
0	1.41	µR	1.14	µR
1	0.81	µR	0.61	µR
1	0.74	µR	0.67	µR
1.5	0.60	µR	0.47	µR
1.5	0.60	µR	0.47	µR

HVL "Front" Side	1.2	mm Al
HVL "Back" Side	1.2	mm Al
Conversion Factor	0.136	
Min. Filtration[1]	1.0	**mm Al**

[1] An HVL of 1 mm Al corresonds to a filtration of 1 mm Al for this system

RESULT **PASS**

Measurements made with Instruments #1 & #2

COMMENTS AND RECOMMENDATIONS

Scattered radiation measurements were not performed since passengers were not being screened through this system at the time of the survey.

* The WB Johnson TVX-2000 was response checked prior to the survey.

Survey Worksheet - AIT 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-0E7J-11
Survey Date	20 Jan 2011
Surveyor(s)	[redacted]

SURVEY LOCATION

Location	Terminal 3, Checkpoint 7, Lanes 5-6, AIT # 17				
Organization	Chicago O'Hare International				
Street Address					
City/Installation	Chicago	State	IL	ZIP	

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	WB Johnson	TVX-2000	40174	*

SYSTEM INFORMATION

Manufacturer	Model	Serial No.	Manuf. Date
Rapiscan	Secure 1000SP	S50950003	Dec 2009

Certified	NA	***Place of Manufacture***	Torrance, CA
Service Provider Survey Date	7 May 2010		

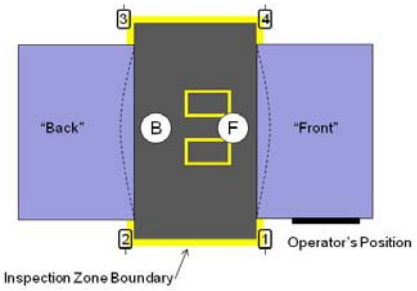
VISUAL INSPECTION

Y	N	Requirement
X		Key activated control with key capture? (21 CFR 1020.31(j); ANSI N43.17-2009, paragraph 7.2.1.c)
	X	"Caution: X-Rays Produced When Energized" label present at control to initiate scan? (21 CFR 1020.31(j); ANSI N43.17-2009, paragraph 7.2.2.d)
X		Technique factors preset for each mode of operation? (21 CFR 1020.31(j); ANSI N43.17-2009, paragraph 7.2.2.b)
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		Means to terminate emission of radiation other than an interlock? (ANSI N43.17-2009, paragraph 7.2.1.e)
X		Scan in progress indicator visible for any location from which a scan can be inititiated? (ANSI N43.17-2009, paragraph 7.2.1.a)

Y	N	Requirement
X		At least one lighted scan in progress indicator visible from the inspection zone? (ANSI N43.17-2009, paragraph 7.2.1.b)
X		X-ray emission terminates after a present time or exposure? (21 CFR 1020.31(j); ANSI N43.17-2009, paragraph 7.2.2.e)
X		Operators have a clear view of the scanning area? (21 CFR 1020.31(j); ANSI N43.17-2009, paragraph 7.2.1.f)
X		Tool or key required to open or remove access panels? (21 CFR 1020.31(j); ANSI N43.17-2009, paragraph 7.2.1.i)
NT		User provided with required information? (21 CFR 1020.31(j); ANSI N43.17-2009, paragraph 7.5)

NT=not tested; NA=not applicable.

SURVEY DIAGRAM



SCANNING MEASUREMENTS

Scanning below action levels? Yes [X] No [ ]
(If no, explain in comments)

Inspection zone boundary scanned with Instrument #3.

SCATTERED RADIATION

Location	Scan 1		Scan 2		Scan 3		Average	
1		µR		µR		µR		µR
2		µR		µR		µR		µR
3		µR		µR		µR		µR
4		µR		µR		µR		µR

Measurements made with Instruments #1 & #2

DOSE PER SCREENING

	Exposure (X)			
Trial	"Front" Side		"Back" Side	
a	5.52	µR	6.39	µR
b	5.66	µR	6.39	µR
c	5.58	µR	6.39	µR
d	5.66	µR	6.66	µR
e	5.52	µR	6.52	µR
AVG	5.59	µR	6.47	µR

Energy Correctin Factor 1.25

Reference Effective Dose per Screening (max 25 µrem)[1]:
2.5 µrem
or
0.025 µSv

RESULT **PASS**

Measurements made with Instruments #1 & #2

BEAM QUALITY

	Exposure (X)			
mm Al	"Front" Side		"Back" Side	
0	1.13	µR	1.01	µR
0	1.13	µR	1.07	µR
1	0.66	µR	0.60	µR
1	0.60	µR	0.60	µR
1.5	0.47	µR	0.47	µR
1.5	0.47	µR	0.53	µR

HVL "Front" Side	1.2	mm Al
HVL "Back" Side	1.4	mm Al
Conversion Factor	0.153	
Min. Filtration[1]	1.0	**mm Al**

[1] An HVL of 1 mm Al corresonds to a filtration of 1 mm Al for this system

RESULT **PASS**

Measurements made with Instruments #1 & #2

COMMENTS AND RECOMMENDATIONS

Scattered radiation measurements were not performed since passengers were not being screened through this system at the time of the survey.

* The WB Johnson TVX-2000 was response checked prior to the survey.

Survey Worksheet - AIT 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-0E7J-11
Survey Date	20 Jan 2011
Surveyor(s)	[redacted]

SURVEY LOCATION

Location	Terminal 3, Checkpoint 7A, Lanes 1-2, AIT # 18				
Organization	Chicago O'Hare International				
Street Address					
City/Installation	Chicago	State	IL	ZIP	

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	WB Johnson	TVX-2000	40174	*

SYSTEM INFORMATION

Manufacturer	*Model*	*Serial No.*	*Manuf. Date*
Rapiscan	Secure 1000SP	S51002007	Jan 2010

Certified	NA	***Place of Manufacture***	Torrance, CA
Service Provider Survey Date	Not Found		

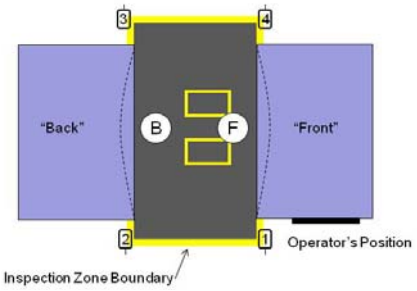
VISUAL INSPECTION

Y	N	*Requirement*
X		Key activated control with key capture? (21 CFR 1020.31(j); ANSI N43.17-2009, paragraph 7.2.1.c)
	X	"Caution: X-Rays Produced When Energized" label present at control to initiate scan? (21 CFR 1020.31(j); ANSI N43.17-2009, paragraph 7.2.2.d)
X		Technique factors preset for each mode of operation? (21 CFR 1020.31(j); ANSI N43.17-2009, paragraph 7.2.2.b)
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		Means to terminate emission of radiation other than an interlock? (ANSI N43.17-2009, paragraph 7.2.1.e)
X		Scan in progress indicator visible for any location from which a scan can be inititiated? (ANSI N43.17-2009, paragraph 7.2.1.a)

Y	N	*Requirement*
X		At least one lighted scan in progress indicator visible from the inspection zone? (ANSI N43.17-2009, paragraph 7.2.1.b)
X		X-ray emission terminates after a present time or exposure? (21 CFR 1020.31(j); ANSI N43.17-2009, paragraph 7.2.2.e)
X		Operators have a clear view of the scanning area? (21 CFR 1020.31(j); ANSI N43.17-2009, paragraph 7.2.1.f)
X		Tool or key required to open or remove access panels? (21 CFR 1020.31(j); ANSI N43.17-2009, paragraph 7.2.1.i)
NT		User provided with required information? (21 CFR 1020.31(j); ANSI N43.17-2009, paragraph 7.5)

NT=not tested; NA=not applicable.

SURVEY DIAGRAM



SCANNING MEASUREMENTS

Scanning below action levels? Yes [X] No [ ]
(If no, explain in comments)

Inspection zone boundary scanned with Instrument #3.

SCATTERED RADIATION

Location	*Scan 1*	*Scan 2*	*Scan 3*	*Average*
1	µR	µR	µR	µR
2	µR	µR	µR	µR
3	µR	µR	µR	µR
4	µR	µR	µR	µR

Measurements made with Instruments #1 & #2

DOSE PER SCREENING

	Exposure (X)			
Trial	*"Front" Side*		*"Back" Side*	
a	5.96	µR	6.30	µR
b	5.70	µR	5.83	µR
c	5.56	µR	6.03	µR
d	5.56	µR	6.03	µR
e	5.63	µR	5.96	µR
AVG	5.68	µR	6.03	µR

Energy Correctin Factor 1.25

Reference Effective Dose per Screening (max 25 µrem)[1]:

2.1 µrem

or

0.021 µSv

RESULT **PASS**

Measurements made with Instruments #1 & #2

BEAM QUALITY

	Exposure (X)			
mm Al	*"Front" Side*		*"Back" Side*	
0	1.07	µR	1.27	µR
0	1.07	µR	1.27	µR
1	0.54	µR	0.73	µR
1	0.54	µR	0.73	µR
1.5	0.47	µR	0.54	µR
1.5	0.47	µR	0.60	µR

HVL "Front" Side	**1.0**	mm Al
HVL "Back" Side	**1.3**	mm Al
Conversion Factor	**0.141**	
Min. Filtration[1]	**1.0**	**mm Al**

[1] An HVL of 1 mm Al corresonds to a filtration of 1 mm Al for this system

RESULT **PASS**

Measurements made with Instruments #1 & #2

COMMENTS AND RECOMMENDATIONS

Scattered radiation measurements were not performed since passengers were not being screened through this system at the time of the survey.

* The WB Johnson TVX-2000 was response checked prior to the survey.

Survey Worksheet - AIT 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-0E7J-11
Survey Date	20 Jan 2011
Surveyor(s)	[redacted]

SURVEY LOCATION

Location	Terminal 3, Checkpoint 7A, Lanes 3-4, AIT # 19				
Organization	Chicago O'Hare International				
Street Address					
City/Installation	Chicago	State	IL	ZIP	

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	WB Johnson	TVX-2000	40174	*

SYSTEM INFORMATION

Manufacturer	*Model*	*Serial No.*	*Manuf. Date*
Rapiscan	Secure 1000SP	S51002008	Jan 2010

Certified	NA	***Place of Manufacture***	Torrance, CA
Service Provider Survey Date	Not Found		

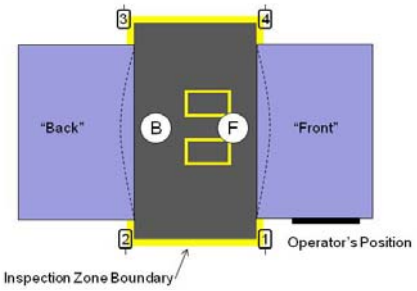
VISUAL INSPECTION

Y	N	*Requirement*
X		Key activated control with key capture? (21 CFR 1020.31(j); ANSI N43.17-2009, paragraph 7.2.1.c)
	X	"Caution: X-Rays Produced When Energized" label present at control to initiate scan? (21 CFR 1020.31(j); ANSI N43.17-2009, paragraph 7.2.2.d)
X		Technique factors preset for each mode of operation? (21 CFR 1020.31(j); ANSI N43.17-2009, paragraph 7.2.2.b)
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		Means to terminate emission of radiation other than an interlock? (ANSI N43.17-2009, paragraph 7.2.1.e)
X		Scan in progress indicator visible for any location from which a scan can be inititiated? (ANSI N43.17-2009, paragraph 7.2.1.a)

Y	N	*Requirement*
X		At least one lighted scan in progress indicator visible from the inspection zone? (ANSI N43.17-2009, paragraph 7.2.1.b)
X		X-ray emission terminates after a present time or exposure? (21 CFR 1020.31(j); ANSI N43.17-2009, paragraph 7.2.2.e)
X		Operators have a clear view of the scanning area? (21 CFR 1020.31(j); ANSI N43.17-2009, paragraph 7.2.1.f)
X		Tool or key required to open or remove access panels? (21 CFR 1020.31(j); ANSI N43.17-2009, paragraph 7.2.1.i)
NT		User provided with required information? (21 CFR 1020.31(j); ANSI N43.17-2009, paragraph 7.5)

NT=not tested; NA=not applicable.

SURVEY DIAGRAM



SCANNING MEASUREMENTS

Scanning below action levels? Yes [X] No [ ]
(If no, explain in comments)

Inspection zone boundary scanned with Instrument #3.

SCATTERED RADIATION

Location	*Scan 1*	*Scan 2*	*Scan 3*	*Average*
1	µR	µR	µR	µR
2	µR	µR	µR	µR
3	µR	µR	µR	µR
4	µR	µR	µR	µR

Measurements made with Instruments #1 & #2

DOSE PER SCREENING

	Exposure (X)			
Trial	*"Front" Side*		*"Back" Side*	
a	6.43	µR	7.30	µR
b	6.29	µR	7.10	µR
c	6.43	µR	6.96	µR
d	6.36	µR	6.90	µR
e	6.58	µR	6.89	µR
AVG	6.42	µR	7.03	µR

Energy Correctin Factor 1.25

Reference Effective Dose per Screening (max 25 µrem)[1]:
2.5 µrem
or
0.025 µSv

RESULT **PASS**

Measurements made with Instruments #1 & #2

BEAM QUALITY

	Exposure (X)			
mm Al	*"Front" Side*		*"Back" Side*	
0	1.14	µR	1.00	µR
0	1.14	µR	0.94	µR
1	0.67	µR	0.60	µR
1	0.61	µR	0.54	µR
1.5	0.47	µR	0.47	µR
1.5	0.47	µR	0.40	µR

HVL "Front" Side	**1.2**	mm Al
HVL "Back" Side	**1.3**	mm Al
Conversion Factor	**0.143**	
Min. Filtration[1]	**1.0**	**mm Al**

[1] An HVL of 1 mm Al corresonds to a filtration of 1 mm Al for this system

RESULT **PASS**

Measurements made with Instruments #1 & #2

COMMENTS AND RECOMMENDATIONS

Scattered radiation measurements were not performed since passengers were not being screened through this system at the time of the survey.

* The WB Johnson TVX-2000 was response checked prior to the survey.

Survey Worksheet - AIT 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-0E7J-11
Survey Date	20 Jan 2011
Surveyor(s)	[redacted]

SURVEY LOCATION

Location	Terminal 3, Checkpoint 8, Lanes 1-2, AIT # 20				
Organization	Chicago O'Hare International				
Street Address					
City/Installation	Chicago	State	IL	ZIP	

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	WB Johnson	TVX-2000	40174	*

SYSTEM INFORMATION

Manufacturer	*Model*	*Serial No.*	*Manuf. Date*
Rapiscan	Secure 1000SP	S51002009	Jan 2010

Certified	NA	***Place of Manufacture***	Torrance, CA
Service Provider Survey Date	Not Found		

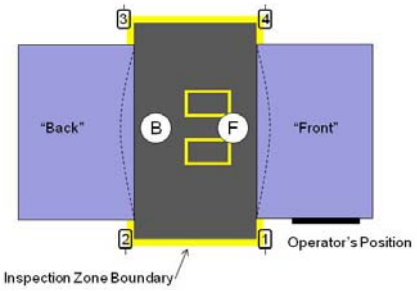
VISUAL INSPECTION

Y	N	*Requirement*
X		Key activated control with key capture? (21 CFR 1020.31(j); ANSI N43.17-2009, paragraph 7.2.1.c)
	X	"Caution: X-Rays Produced When Energized" label present at control to initiate scan? (21 CFR 1020.31(j); ANSI N43.17-2009, paragraph 7.2.2.d)
X		Technique factors preset for each mode of operation? (21 CFR 1020.31(j); ANSI N43.17-2009, paragraph 7.2.2.b)
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		Means to terminate emission of radiation other than an interlock? (ANSI N43.17-2009, paragraph 7.2.1.e)
X		Scan in progress indicator visible for any location from which a scan can be inititiated? (ANSI N43.17-2009, paragraph 7.2.1.a)

Y	N	*Requirement*
X		At least one lighted scan in progress indicator visible from the inspection zone? (ANSI N43.17-2009, paragraph 7.2.1.b)
X		X-ray emission terminates after a present time or exposure? (21 CFR 1020.31(j); ANSI N43.17-2009, paragraph 7.2.2.e)
X		Operators have a clear view of the scanning area? (21 CFR 1020.31(j); ANSI N43.17-2009, paragraph 7.2.1.f)
X		Tool or key required to open or remove access panels? (21 CFR 1020.31(j); ANSI N43.17-2009, paragraph 7.2.1.i)
NT		User provided with required information? (21 CFR 1020.31(j); ANSI N43.17-2009, paragraph 7.5)

NT=not tested; NA=not applicable.

SURVEY DIAGRAM



SCANNING MEASUREMENTS

Scanning below action levels? Yes [X] No [ ]
(If no, explain in comments)

Inspection zone boundary scanned with Instrument #3.

SCATTERED RADIATION

Location	*Scan 1*	*Scan 2*	*Scan 3*	*Average*
1	µR	µR	µR	µR
2	µR	µR	µR	µR
3	µR	µR	µR	µR
4	µR	µR	µR	µR

Measurements made with Instruments #1 & #2

DOSE PER SCREENING

	Exposure (X)			
Trial	*"Front" Side*		*"Back" Side*	
a	5.01	µR	5.88	µR
b	5.01	µR	5.68	µR
c	5.14	µR	5.68	µR
d	5.21	µR	5.67	µR
e	5.14	µR	5.54	µR
AVG	5.10	µR	5.69	µR

Energy Correctin Factor 1.25

Reference Effective Dose per Screening (max 25 µrem)[1]:

1.8 µrem

or

0.018 µSv

RESULT **PASS**

Measurements made with Instruments #1 & #2

BEAM QUALITY

	Exposure (X)			
mm Al	*"Front" Side*		*"Back" Side*	
0	0.80	µR	0.93	µR
0	0.80	µR	0.87	µR
1	0.40	µR	0.53	µR
1	0.40	µR	0.47	µR
1.5	0.33	µR	0.33	µR
1.5	0.33	µR	0.40	µR

HVL "Front" Side	**1.0**	mm Al
HVL "Back" Side	**1.2**	mm Al
Conversion Factor	**0.128**	
Min. Filtration[1]	**1.0**	**mm Al**

[1] An HVL of 1 mm Al corresonds to a filtration of 1 mm Al for this system

RESULT **PASS**

Measurements made with Instruments #1 & #2

COMMENTS AND RECOMMENDATIONS

Scattered radiation measurements were not performed since passengers were not being screened through this system at the time of the survey.

* The WB Johnson TVX-2000 was response checked prior to the survey.

Survey Worksheet - AIT 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-0E7J-11
Survey Date	20 Jan 2011
Surveyor(s)	[redacted]

SURVEY LOCATION

Location	Terminal 3, Checkpoint 9, Lanes 1-2, AIT # 21				
Organization	Chicago O'Hare International				
Street Address					
City/Installation	Chicago	State	IL	ZIP	

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	WB Johnson	TVX-2000	40174	*

SYSTEM INFORMATION

Manufacturer	Model	Serial No.	Manuf. Date
Rapiscan	Secure 1000SP	S51009008	Mar 2010

Certified	NA	***Place of Manufacture***	Torrance, CA
Service Provider Survey Date	1 Jul 2010		

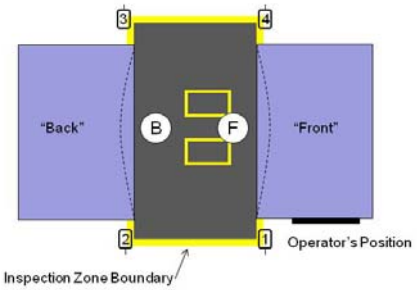
VISUAL INSPECTION

Y	N	Requirement
X		Key activated control with key capture? (21 CFR 1020.31(j); ANSI N43.17-2009, paragraph 7.2.1.c)
	X	"Caution: X-Rays Produced When Energized" label present at control to initiate scan? (21 CFR 1020.31(j); ANSI N43.17-2009, paragraph 7.2.2.d)
X		Technique factors preset for each mode of operation? (21 CFR 1020.31(j); ANSI N43.17-2009, paragraph 7.2.2.b)
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		Means to terminate emission of radiation other than an interlock? (ANSI N43.17-2009, paragraph 7.2.1.e)
X		Scan in progress indicator visible for any location from which a scan can be inititiated? (ANSI N43.17-2009, paragraph 7.2.1.a)

Y	N	Requirement
X		At least one lighted scan in progress indicator visible from the inspection zone? (ANSI N43.17-2009, paragraph 7.2.1.b)
X		X-ray emission terminates after a present time or exposure? (21 CFR 1020.31(j); ANSI N43.17-2009, paragraph 7.2.2.e)
X		Operators have a clear view of the scanning area? (21 CFR 1020.31(j); ANSI N43.17-2009, paragraph 7.2.1.f)
X		Tool or key required to open or remove access panels? (21 CFR 1020.31(j); ANSI N43.17-2009, paragraph 7.2.1.i)
NT		User provided with required information? (21 CFR 1020.31(j); ANSI N43.17-2009, paragraph 7.5)

NT=not tested; NA=not applicable.

SURVEY DIAGRAM



SCANNING MEASUREMENTS

Scanning below action levels? Yes [X] No [ ]
(If no, explain in comments)

Inspection zone boundary scanned with Instrument #3.

SCATTERED RADIATION

Location	Scan 1		Scan 2		Scan 3		Average	
1		µR		µR		µR		µR
2		µR		µR		µR		µR
3		µR		µR		µR		µR
4		µR		µR		µR		µR

Measurements made with Instruments #1 & #2

DOSE PER SCREENING

	Exposure (X)			
Trial	"Front" Side		"Back" Side	
a	5.82	µR	6.63	µR
b	6.49	µR	6.69	µR
c	6.63	µR	6.49	µR
d	6.49	µR	6.49	µR
e	6.90	µR	6.43	µR
AVG	6.47	µR	6.55	µR

Energy Correctin Factor 1.25

Reference Effective Dose per Screening (max 25 µrem)[1]:
2.4 µrem
or
0.024 µSv

RESULT **PASS**

Measurements made with Instruments #1 & #2

BEAM QUALITY

	Exposure (X)			
mm Al	"Front" Side		"Back" Side	
0	1.20	µR	1.07	µR
0	1.21	µR	1.07	µR
1	0.60	µR	0.61	µR
1	0.60	µR	0.60	µR
1.5	0.53	µR	0.54	µR
1.5	0.47	µR	0.46	µR

HVL "Front" Side	**1.0**	mm Al
HVL "Back" Side	**1.3**	mm Al
Conversion Factor	**0.145**	
Min. Filtration[1]	**1.0**	**mm Al**

[1] An HVL of 1 mm Al corresonds to a filtration of 1 mm Al for this system

RESULT **PASS**

Measurements made with Instruments #1 & #2

COMMENTS AND RECOMMENDATIONS

Scattered radiation measurements were not performed since passengers were not being screened through this system at the time of the survey.

* The WB Johnson TVX-2000 was response checked prior to the survey.

Survey Worksheet - AIT 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-0E7J-11
Survey Date	20 Jan 2011
Surveyor(s)	[redacted]

SURVEY LOCATION

Location	Terminal 5, Checkpoint 10, Lanes 6-7, AIT # 22				
Organization	Chicago O'Hare International				
Street Address					
City/Installation	Chicago	State	IL	ZIP	

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	WB Johnson	TVX-2000	40174	*

SYSTEM INFORMATION

Manufacturer	*Model*	*Serial No.*	*Manuf. Date*
Rapiscan	Secure 1000SP	S51002004	Jan 2010

Certified	NA	***Place of Manufacture***	Torrance, CA
Service Provider Survey Date	Not Found		

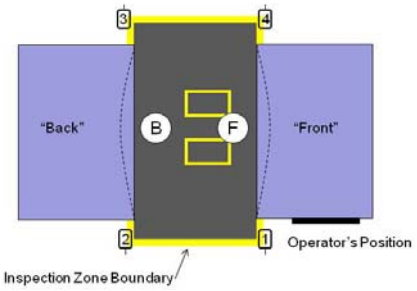
VISUAL INSPECTION

Y	N	*Requirement*
X		Key activated control with key capture? (21 CFR 1020.31(j); ANSI N43.17-2009, paragraph 7.2.1.c)
	X	"Caution: X-Rays Produced When Energized" label present at control to initiate scan? (21 CFR 1020.31(j); ANSI N43.17-2009, paragraph 7.2.2.d)
X		Technique factors preset for each mode of operation? (21 CFR 1020.31(j); ANSI N43.17-2009, paragraph 7.2.2.b)
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		Means to terminate emission of radiation other than an interlock? (ANSI N43.17-2009, paragraph 7.2.1.e)
X		Scan in progress indicator visible for any location from which a scan can be inititiated? (ANSI N43.17-2009, paragraph 7.2.1.a)

Y	N	*Requirement*
X		At least one lighted scan in progress indicator visible from the inspection zone? (ANSI N43.17-2009, paragraph 7.2.1.b)
X		X-ray emission terminates after a present time or exposure? (21 CFR 1020.31(j); ANSI N43.17-2009, paragraph 7.2.2.e)
X		Operators have a clear view of the scanning area? (21 CFR 1020.31(j); ANSI N43.17-2009, paragraph 7.2.1.f)
X		Tool or key required to open or remove access panels? (21 CFR 1020.31(j); ANSI N43.17-2009, paragraph 7.2.1.i)
NT		User provided with required information? (21 CFR 1020.31(j); ANSI N43.17-2009, paragraph 7.5)

NT=not tested; NA=not applicable.

SURVEY DIAGRAM



SCANNING MEASUREMENTS

Scanning below action levels? Yes [X] No [ ]
(If no, explain in comments)

Inspection zone boundary scanned with Instrument #3.

SCATTERED RADIATION

Location	*Scan 1*	*Scan 2*	*Scan 3*	*Average*
1	µR	µR	µR	µR
2	µR	µR	µR	µR
3	µR	µR	µR	µR
4	µR	µR	µR	µR

Measurements made with Instruments #1 & #2

DOSE PER SCREENING

	Exposure (X)			
Trial	*"Front" Side*		*"Back" Side*	
a	5.60	µR	6.49	µR
b	5.67	µR	6.55	µR
c	5.67	µR	6.55	µR
d	5.67	µR	6.48	µR
e	5.74	µR	6.41	µR
AVG	5.67	µR	6.50	µR

Energy Correctin Factor 1.25

Reference Effective Dose per Screening (max 25 µrem)[1]:
2.2 µrem
or
0.022 µSv

RESULT **PASS**

Measurements made with Instruments #1 & #2

BEAM QUALITY

	Exposure (X)			
mm Al	*"Front" Side*		*"Back" Side*	
0	1.28	µR	1.55	µR
0	1.21	µR	1.48	µR
1	0.74	µR	0.80	µR
1	0.67	µR	0.74	µR
1.5	0.54	µR	0.61	µR
1.5	0.54	µR	0.61	µR

HVL "Front" Side	**1.2**	mm Al
HVL "Back" Side	**1.0**	mm Al
Conversion Factor	**0.136**	
Min. Filtration[1]	**1.0**	**mm Al**

[1] An HVL of 1 mm Al corresonds to a filtration of 1 mm Al for this system

RESULT **PASS**

Measurements made with Instruments #1 & #2

COMMENTS AND RECOMMENDATIONS

Scattered radiation measurements were not performed since passengers were not being screened through this system at the time of the survey.

* The WB Johnson TVX-2000 was response checked prior to the survey.

Survey Worksheet - AIT 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-0E7J-11
Survey Date	20 Jan 2011
Surveyor(s)	[redacted]

SURVEY LOCATION

Location	Terminal 5, Checkpoint 10, Lanes 4-5, AIT # 23				
Organization	Chicago O'Hare International				
Street Address					
City/Installation	Chicago	State	IL	ZIP	

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	WB Johnson	TVX-2000	40174	*

SYSTEM INFORMATION

Manufacturer	*Model*	*Serial No.*	*Manuf. Date*
Rapiscan	Secure 1000SP	S51002005	Jan 2010

Certified	NA	***Place of Manufacture***	Torrance, CA
Service Provider Survey Date	Not Found		

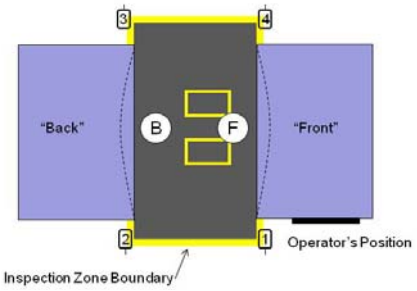
VISUAL INSPECTION

Y	N	*Requirement*
X		Key activated control with key capture? (21 CFR 1020.31(j); ANSI N43.17-2009, paragraph 7.2.1.c)
	X	"Caution: X-Rays Produced When Energized" label present at control to initiate scan? (21 CFR 1020.31(j); ANSI N43.17-2009, paragraph 7.2.2.d)
X		Technique factors preset for each mode of operation? (21 CFR 1020.31(j); ANSI N43.17-2009, paragraph 7.2.2.b)
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		Means to terminate emission of radiation other than an interlock? (ANSI N43.17-2009, paragraph 7.2.1.e)
X		Scan in progress indicator visible for any location from which a scan can be inititiated? (ANSI N43.17-2009, paragraph 7.2.1.a)

Y	N	*Requirement*
X		At least one lighted scan in progress indicator visible from the inspection zone? (ANSI N43.17-2009, paragraph 7.2.1.b)
X		X-ray emission terminates after a present time or exposure? (21 CFR 1020.31(j); ANSI N43.17-2009, paragraph 7.2.2.e)
X		Operators have a clear view of the scanning area? (21 CFR 1020.31(j); ANSI N43.17-2009, paragraph 7.2.1.f)
X		Tool or key required to open or remove access panels? (21 CFR 1020.31(j); ANSI N43.17-2009, paragraph 7.2.1.i)
NT		User provided with required information? (21 CFR 1020.31(j); ANSI N43.17-2009, paragraph 7.5)

NT=not tested; NA=not applicable.

SURVEY DIAGRAM



SCANNING MEASUREMENTS

Scanning below action levels? Yes [X] No [ ]
(If no, explain in comments)

Inspection zone boundary scanned with Instrument #3.

SCATTERED RADIATION

Location	*Scan 1*	*Scan 2*	*Scan 3*	*Average*
1	µR	µR	µR	µR
2	µR	µR	µR	µR
3	µR	µR	µR	µR
4	µR	µR	µR	µR

Measurements made with Instruments #1 & #2

DOSE PER SCREENING

	Exposure (X)			
Trial	*"Front" Side*		*"Back" Side*	
a	5.39	µR	6.34	µR
b	5.46	µR	6.20	µR
c	5.46	µR	6.34	µR
d	5.60	µR	6.21	µR
e	5.46	µR	6.21	µR
AVG	5.47	µR	6.26	µR

Energy Correctin Factor 1.25

Reference Effective Dose per Screening (max 25 µrem)[1]:

2.0 µrem

or

0.020 µSv

RESULT **PASS**

Measurements made with Instruments #1 & #2

BEAM QUALITY

	Exposure (X)			
mm Al	*"Front" Side*		*"Back" Side*	
0	1.21	µR	1.08	µR
0	1.22	µR	0.94	µR
1	0.61	µR	0.60	µR
1	0.61	µR	0.54	µR
1.5	0.47	µR	0.40	µR
1.5	0.47	µR	0.40	µR

HVL "Front" Side	**1.0**	mm Al
HVL "Back" Side	**1.2**	mm Al
Conversion Factor	**0.129**	
Min. Filtration[1]	**1.0**	**mm Al**

[1] An HVL of 1 mm Al corresonds to a filtration of 1 mm Al for this system

RESULT **PASS**

Measurements made with Instruments #1 & #2

COMMENTS AND RECOMMENDATIONS

Scattered radiation measurements were not performed since passengers were not being screened through this system at the time of the survey.

* The WB Johnson TVX-2000 was response checked prior to the survey.

Survey Notes Provided on 21 January 2011

Encl 2

MCHB-IP-OHP 21 January 2011

Exit Briefing Notes

1. Project Information.

a. Radiation Protection Survey No. 26-MF-0E7J-11

b. Survey dates: 19-20 January 2011

c. Chicago O'Hare International Airport (ORD), Chicago, IL

d. Survey Officer(s): [redacted] CHP; [redacted] CHP; [redacted]

2. Background Information.

a. TSA Headquarters Contact: Jill Segraves, Director, Occupational Safety, Health, and Environment (OSHE), [redacted]

b. Airport Contacts:

(1) Gregory Hanson, Safety Specialist, Phone: [redacted]

(2) Robert D. Sanford, Occupational Health and Safety Specialist, Phone: [redacted]

c. Individuals assisting the survey team:

Name	Title/Position
Shawn Mickel	TSO, CDSO
Michael J. Thomas	TSO, CDSO, Chairman SAT
John Stockhausen	LTSO, CDSO
Christian Cuajunco	TSO, CDSO
Eddy Palacios	TSO, CDSO
Harry Cerrato	TSO, CDSO

d. X-ray systems surveyed:

Model	Serial No.	Location
Rapiscan Secure 1000 SP	S51002003	Terminal 1, Checkpoint 1, Lanes 1-2, AIT #1
Rapiscan Secure 1000 SP	S51002001	Terminal 1, Checkpoint 1, Lanes 3-4, AIT #2
Rapiscan Secure 1000 SP	S50952006	Terminal 1, Checkpoint 1, Lanes 7-8, AIT #4
Rapiscan Secure 1000 SP	S51002012	Terminal 1, Checkpoint

		2, Lane 1 , AIT #5
Rapiscan Secure 1000 SP	S51002013	Terminal 1, Checkpoint , Lanes 2-3, AIT #6
Rapiscan Secure 1000 SP	S51002014	Terminal 1, Checkpoint 2, Lanes 4-5, AIT #7
Rapiscan Secure 1000 SP	S51003001	Terminal 1, Checkpoint 2, Lanes 6-7, AIT #8
Rapiscan Secure 1000 SP	S51003002	Terminal 1, Checkpoint 2, Lanes 8-9, AIT #9
Rapiscan Secure 1000 SP	S51002002	Terminal 1, Checkpoint 3A, Lanes 1-2, AIT #10
Rapiscan Secure 1000 SP	S50952007	Terminal 1, Checkpoint 3A, Lanes 3-4, AIT #11
Rapiscan Secure 1000 SP	S51002006	Terminal 2, Checkpoint 4, Lanes 1-2, AIT #12
Rapiscan Secure 1000 SP	S51002011	Terminal 2, Checkpoint 5, Lanes 1-2, AIT #13
Rapiscan Secure 1000 SP	S51002010	Terminal 3, Checkpoint 6, Lanes 1-2, AIT #14
Rapiscan Secure 1000 SP	S50950005	Terminal 3, Checkpoint 7, Lanes 1-2, AIT #15
Rapiscan Secure 1000 SP	S50950004	Terminal 3, Checkpoint 7, Lanes 3-4, AIT #16
Rapiscan Secure 1000 SP	S50950003	Terminal 3, Checkpoint 7, Lanes 5-6, AIT #17
Rapiscan Secure 1000 SP	S51002007	Terminal 3, Checkpoint 7A, Lanes 1-2, AIT #18
Rapiscan Secure 1000 SP	S51002008	Terminal 3, Checkpoint 7A, Lanes 3-4, AIT #19
Rapiscan Secure 1000 SP	S51002009	Terminal 3, Checkpoint 8, Lanes 1-2, AIT #20
Rapiscan Secure 1000 SP	S51009008	Terminal 3, Checkpoint 9, Lanes 1-2, AIT #21
Rapiscan Secure 1000 SP	S51002004	Terminal 5, Checkpoint 10, Lanes 6-7, AIT #22
Rapiscan Secure 1000 SP	S51002005	Terminal 5, Checkpoint 10, Lanes 4-5, AIT #23

3. Findings and Recommendations.

a. All x-ray personnel screening systems were found to be in compliance with the radiation dose limits of American National Standards Institute/Health Physics Society

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

b. All systems were found to be in compliance with the other requirements of ANSI/HPS N43.17-2009, with the following exception - the warning label “Caution: X-Rays Produced when Energized” was not present at the location where scans can be initiated for all Rapiscan Secure 1000SP systems.

c. The following systems did not have a maintenance service provider survey date posted on system: AIT Nos. 1, 4, 5, 6, 7, 8, 9, 13, 14, 18, 19, 20, 22, 23.

4. Discussion.

a. Based on measurements at the inspection zone boundary it is estimated that an individual would need to be present at the inspection zone boundary for 1,000,000 screenings in one year to reach the public dose limit. Assuming 600 screening are accomplished each hour, then a TSO would need to be at the inspection zone boundary for 1666 hours of the work year to reach the public dose limit of 100 millirem per year.

b. Longer term measurements using area dosimeters on Terminal 1, AIT No. 7, Terminal 2, AIT No. 13, Terminal 3, AIT No. 19, Terminal 5, AIT No. 23 are underway and will be used to refine the above estimates. Six dosimeters were mounted on each system. The area dosimeters will be collected in approximately two to three months. The measurement data from the area dosimeters along with the number of screenings on each of the four monitored systems over this time period will be used to refine the estimates.