APPLICATION FOR HCAI SPECIAL SEISMIC CERTIFICATION PREAPPROVAL (OSP)

OFFICE USE ONLY

APPLICATION #: OSP-0766

HCAI Special Seismic Certification Preapproval (OSP)

Type: [X] New [ ] Renewal

Manufacturer Information

Manufacturer: Shanghai United Imaging Healthcare Co., Ltd.

Manufacturer's Technical Representative: Xin GAI

Mailing Address: 2258 Chengbei Rd., Jiading District, Shanghai, 201807

Telephone: +86 (21) 67076888 Email: xin.gao@united-imaging.com

Product Information

Product Name: Fluoroscopy and Radiography Systems

Product Type: NA

Product Model Number: uDR X-Ray and Fluoroscopy System

General Description: Multiple component digital radiography and fluoroscopy medical diagnostic imaging system.

Mounting Description: Several – See UUT Sheets

Tested Seismic Enhancements: Seismic enhancements made to the test units and/or modifications required to address anomalies during the tests shall be incorporated into the production units.

Applicant Information

Applicant Company Name: WE Gundy & Associates, Inc

Contact Person: Travis Soppe

Mailing Address: PO Box 9121, Boise, ID 83707

Telephone: (208) 342-5989 Email: tsoppe@wegai.com

Title: President

California Licensed Structural Engineer Responsible for the Engineering and Test Report(s)

Company Name: W.E. GUNDY & ASOCIATES INC.

Name: Travis Soppe California License Number: S6115

Mailing Address: P.O. Box 9121, Boise, ID 83707

Telephone: (208) 342-5989 Email: tsoppe@wegai.com

Certification Method

☐ GR-63-Core ☐ ICC-ES AC156 ☒ IEEE 344 ☐ IEEE 693 ☐ NEBS 3

☐ Other (Please Specify):

Testing Laboratory

Company Name: SUZHOU ELECTRICAL APPARATUS SCIENCE RESEARCH INSTITUTE CO., LTD. (EETI)

Contact Person: Tangfu Ji

Mailing Address: No. 5, Yuexi Qianzhu Road, Wuzhong District, Suzhou, 215104 Jiangsu, CHINA

Telephone: 86 (512) 69552195 Email: eeti-kz@eeti.cn

Seismic Parameters

Design Basis of Equipment or Components (F_p/W_p) = See Attachments

S_{DS} (Design spectral response acceleration at short period, g) = 2.00 (z/h = 1.0) and 2.50 (z/h = 0.0)

a_p (Amplification factor) = See attachments

R_p (Response modification factor) = See attachments

Ω_0 (System overstrength factor) = See Attachment

I_p (Importance factor) = 1.5

z/h (Height ratio factor) = 1 and 0

Natural frequencies (Hz) = See Attachment

Overall dimensions and weight = See Attachment

HCAI Approval (For Office Use Only) - **Approval Expires on 09/20/2029**

Date: 9/20/2023

Name: Mohammad Karim Title: Supervisor, Health Facilities

Special Seismic Certification Valid Up to: S_{DS} (g) = See Above z/h = See Above

Condition of Approval (if applicable):

Table 1	UNITED IMAGING HEALTHCARE Co., Ltd SPECIAL SEISMIC CERTIFICATION CERTIFIED SYSTEM AND COMPONENTS	WEGAI W.E. GUNDY & ASSOCIATES, INC. STRUCTURAL & EARTHQUAKE ENGINEERING

System: uDR X-Ray and Fluoroscopy Systems | **Manufacturer:** United Imaging Healthcare Co., Ltd

System Component[1]	United Imaging Part Number	Dimensions (in)			Weight (lb)	Mounting	UUT
		Width	Length	Height			
Tube Ceiling Stand							
TCS - uDR780i	18050430	39.4-52.4	51.2-67.6	53.2-124.1	882	ceiling	UUT-1
Bucky Wall Stand							
BSW-1 - uDR596i	18047224	26.4	24.0	88.5	547	floor	UUT-2
BWS-2 - uDR780i	18046649	37.9	24.0	88.5	573	floor	UUT-3
Tube Stand							
TS - uDR596i	18047045	42.9-73.7	94.4-144.4	89.8	507	floor	UUT-4
Patient Table[2]							
TBL-1 - uDR596i	18050033	33.1-42.7	90.6-129.2	27.6	1157	floor	UUT-5
TBL-2 - uDR780i	78010619	33.3	91.4	19.4-34.9	992	floor	UUT-6

Notes:

[1] All components are manufactured by United Imaging Healthcare Co., Ltd. The part numbers listed uniquely identify the type of component, manufacturer, and material of construction for each sub-component within the tested units.

[2] Patient table weights do not include 565lb simulated patient weight.

[3] PC is installed in a United Imaging Healthcare cabinet with model number 18022538

SEISMIC CERTIFICATION LIMITS

System Component	Code	S_{DS} (g)	z / h	I_P	a_P	R_P	Ω_0	F_P / W_P
Tube Ceiling Stand	CBC 2022	2.0	1.0	1.50	2.5	2.5	2.0	3.60
		2.5	0					1.50
Bucky Wall Stand	CBC 2022	2.0	1.0	1.50	1.0	1.5	2.0	2.40
		2.5	0					1.13
Tube Stand	CBC 2022	2.0	1.0	1.50	1.0	1.5	2.0	2.40
		2.5	0					1.13
Patient Table	CBC 2022	2.0	1.0	1.50	1.0	1.5	2.0	2.40
		2.5	0					1.13

Table 1	UNITED IMAGING HEALTHCARE Co., Ltd SPECIAL SEISMIC CERTIFICATION CERTIFIED SYSTEM AND COMPONENTS	WEGAI W.E. GUNDY & ASSOCIATES, INC. STRUCTURAL & EARTHQUAKE ENGINEERING

System: uDR X-Ray and Fluoroscopy Systems | **Manufacturer:** United Imaging Healthcare Co., Ltd

System Component[1]	United Imaging Part Number	Dimensions (in)			Weight (lb)	Mounting	UUT
		Width	Length	Height			
Power Supply Cabinet							
PSC - uDR780i	80504613	23.2	32.5	52.5	375	wall	UUT-7
Imaging Systems (Cabinet / Internally Mounted PC)[3]							
PC Cabinet PC - uDR596i / uDR780i	18022538 60007750	34.2 7.2	30.3 14.3	35.8 16.7	174 16	floor	UUT-8

Notes:

[1] All components are manufactured by United Imaging Healthcare Co., Ltd. The part numbers listed uniquely identify the type of component, manufacturer, and material of construction for each sub-component within the tested units.

[2] Patient table weights do not include 565lb simulated patient weight.

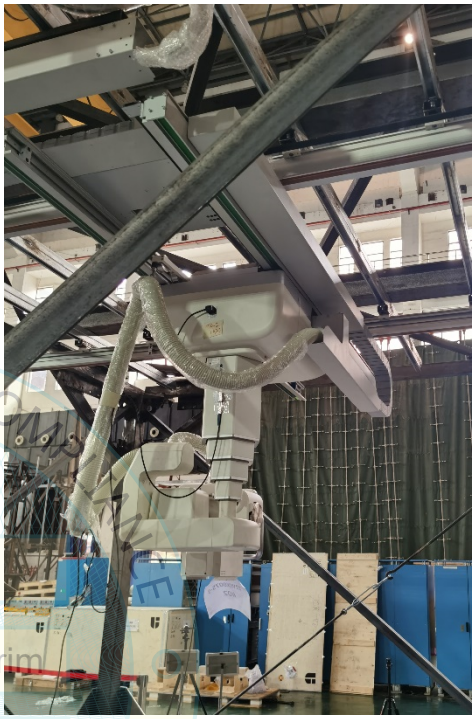
[3] PC is installed in a United Imaging Healthcare cabinet with model number 18022538 (see cabinet dimensions / weight above)

SEISMIC CERTIFICATION LIMITS

System Component	Code	S_{DS} (g)	z / h	I_P	a_P	R_P	Ω_0	F_P / W_P
Power Supply Cabinet	CBC 2022	2.0	1.0	1.50	2.5	6.0	2.0	1.50
		2.5	0					1.13
PC / User Interface	CBC 2022	2.0	1.0	1.50	2.5	6.0	2.0	1.50
		2.5	0					1.13

UUT-1	UNIT UNDER TEST (UUT) SUMMARY SHEET	WEGAI W.E. GUNDY & ASSOCIATES, INC. STRUCTURAL & EARTHQUAKE ENGINEERING

Mounting Details: Rigid ceiling mounted with (28) M8 grade 12.9 bolts; two bolts at each intersection with the ceiling Unistrut grid spaced at 19.7" on center.



Manufacturer: United Imaging Healthcare	**Test Location:** EETI (Suzhou, CHINA)
Component: TCS – uDR780i	**Test Date:** September 2022
Model Number: 18050430	**Report Number:** 1340-05
UUT Function: X-Ray stand, ceiling suspended, for use in radiography imaging	
UUT Description: Component of the uDR780i x-ray system	

UUT PROPERTIES

Weight (lb)	Dimensions (inches)			Natural Frequency (Hz)		
	Width	Depth	Height	FB	SS	V
882	49.9	59.4	110.9	na	na	na

The ceiling suspended tube stand moves laterally, rotates, and extends up and down to accommodate different patients and procedures. The system was tested in the normal operating position with the system horizontally centered, no rotation, and with a downward extension of 57.7in.

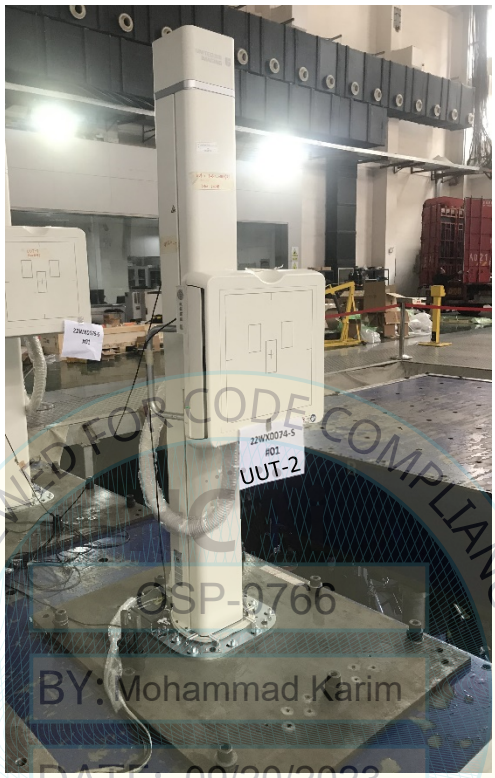
SEISMIC TEST PARAMETERS

Building Code / Test Criteria	S_{DS} (g)	z / h	I_P	A_{FLX-H} (g)	A_{RIG-H} (g)	A_{FLX-V} (g)	A_{RIG-V} (g)
CBC 2022 / ICC-ES AC156	2.00	1.0	1.5	3.20	2.40	-	-
	2.50	0	1.5	-	-	1.67	0.67

Note: The unit was full of contents during testing and remained functional before and after the ICC-ES AC156 test. The unit maintained structural integrity during and after the ICC-ES AC156 test.

UUT-2	UNIT UNDER TEST (UUT) SUMMARY SHEET	WEGAI W.E. GUNDY & ASSOCIATES, INC. STRUCTURAL & EARTHQUAKE ENGINEERING

Mounting Details: Rigid floor mounted with (10) M12 grade 8.8 bolts



Manufacturer: United Imaging Healthcare	**Test Location:** EETI (Suzhou, CHINA)
Component: BWS-1 – uDR596i	**Test Date:** September 2022
Model Number: 18047224	**Report Number:** 1340-05
UUT Function: Radiographic wall stand for x-ray exposures	
UUT Description: Component of the uDR596i x-ray system	

UUT PROPERTIES

Weight (lb)	Dimensions (inches)			Natural Frequency (Hz)		
	Width	Depth	Height	FB	SS	V
547	26.4	24.0	88.5	12.5	11.0	17.5

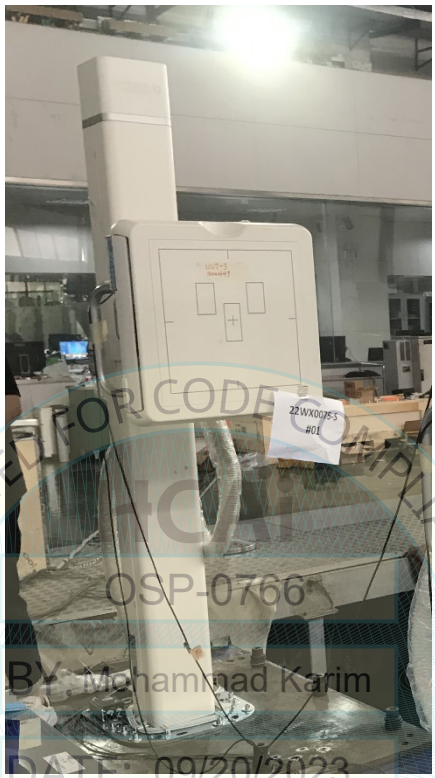
SEISMIC TEST PARAMETERS

Building Code / Test Criteria	S_{DS} (g)	z / h	I_P	A_{FLX-H} (g)	A_{RIG-H} (g)	A_{FLX-V} (g)	A_{RIG-V} (g)
CBC 2022 / ICC-ES AC156	2.00	1.0	1.5	3.20	2.40	-	-
	2.50	0	1.5	-	-	1.67	0.67

Note: The unit was full of contents during testing and remained functional before and after the ICC-ES AC156 test. The unit maintained structural integrity during and after the ICC-ES AC156 test.

UUT-3	UNIT UNDER TEST (UUT) SUMMARY SHEET	WEGAI W.E. Gundy & Associates, Inc. Structural & Earthquake Engineering

Mounting Details: Rigid floor mounted with (10) M12 grade 8.8 bolts



Manufacturer: United Imaging Healthcare	**Test Location:** EETI (Suzhou, CHINA)
Component: BWS-2 – uDR780i	**Test Date:** September 2022
Model Number: 18046649	**Report Number:** 1340-05
UUT Function: Radiographic wall stand for x-ray exposures	
UUT Description: Component of the uDR780i x-ray system	

UUT PROPERTIES

Weight (lb)	Dimensions (inches)			Natural Frequency (Hz)		
	Width	Depth	Height	FB	SS	V
573	37.9	24.0	88.5	7.5	4.0	8.0

SEISMIC TEST PARAMETERS

Building Code / Test Criteria	S_{DS} (g)	z / h	I_P	A_{FLX-H} (g)	A_{RIG-H} (g)	A_{FLX-V} (g)	A_{RIG-V} (g)
CBC 2022 / ICC-ES AC156	2.00	1.0	1.5	3.20	2.40	-	-
	2.50	0	1.5	-	-	1.67	0.67

Note: The unit was full of contents during testing and remained functional before and after the ICC-ES AC156 test. The unit maintained structural integrity during and after the ICC-ES AC156 test.

UUT-4	UNIT UNDER TEST (UUT) SUMMARY SHEET	WEGAI W.E. GUNDY & ASSOCIATES, INC. STRUCTURAL & EARTHQUAKE ENGINEERING

Mounting Details: Rigid floor mounted with (4) M12 grade 8.8 bolts

Manufacturer: United Imaging Healthcare	**Test Location:** EETI (Suzhou, CHINA)
Component: TS – uDR596i	**Test Date:** September 2022
Model Number: 18047045	**Report Number:** 1340-05
UUT Function: Radiographic tube stand for x-ray exposures	
UUT Description: Component of the uDR596i x-ray system	

UUT PROPERTIES

Weight (lb)	Dimensions (inches)			Natural Frequency (Hz)		
	Width	Depth	Height	FB	SS	V
507	73.7	144.4	89.8	3.5	4.5	9.0

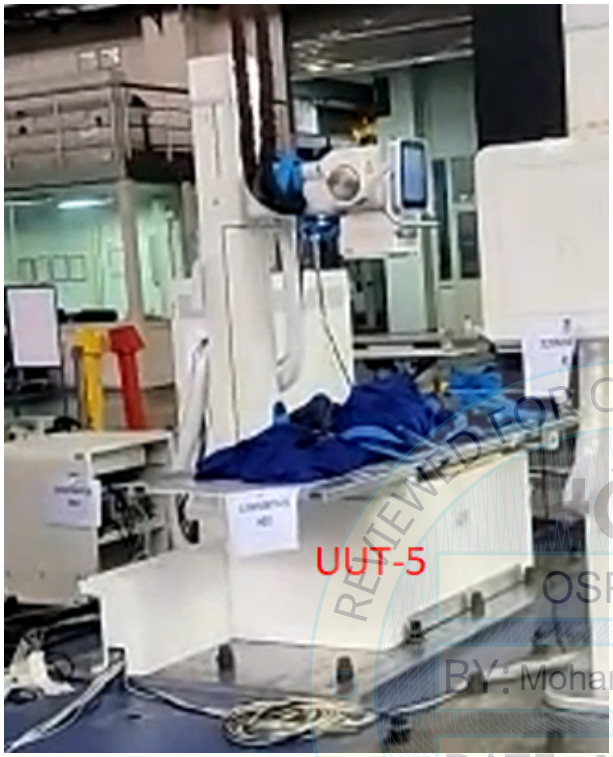
SEISMIC TEST PARAMETERS

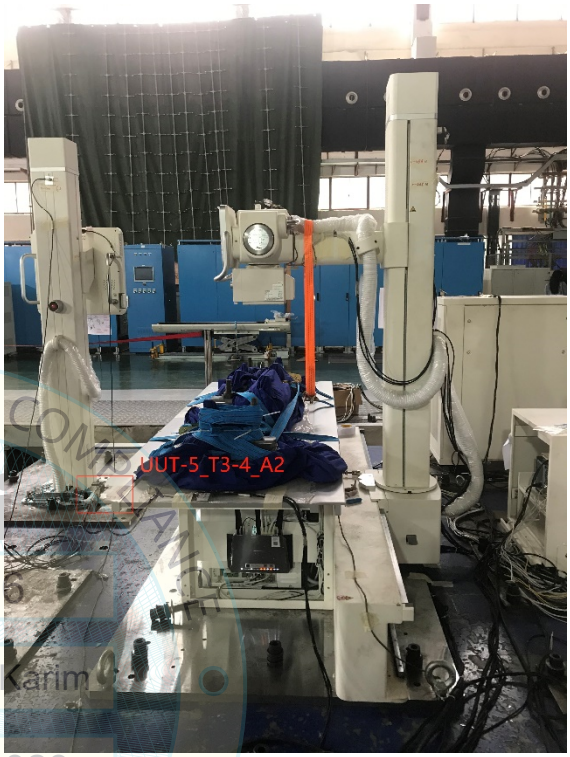
Building Code / Test Criteria	S_{DS} (g)	z / h	I_P	A_{FLX-H} (g)	A_{RIG-H} (g)	A_{FLX-V} (g)	A_{RIG-V} (g)
CBC 2022 / ICC-ES AC156	2.00	1.0	1.5	3.20	2.40	-	-
	2.50	0	1.5	-	-	1.67	0.67

Note: The unit was full of contents during testing and remained functional before and after the ICC-ES AC156 test. The unit maintained structural integrity during and after the ICC-ES AC156 test.

UUT-5	UNIT UNDER TEST (UUT) SUMMARY SHEET	WEGAI W.E. GUNDY & ASSOCIATES, INC. STRUCTURAL & EARTHQUAKE ENGINEERING

Mounting Details: Rigid floor mounted with (8) M12 grade 8.8 bolts





Manufacturer: United Imaging Healthcare	**Test Location:** EETI (Suzhou, CHINA)
Component: TBL-1 – uDR596i	**Test Date:** September 2022
Model Number: 18050033	**Report Number:** 1340-05
UUT Function: Motorized patient support	
UUT Description: Patient support for the uDR596i x-ray system	

UUT PROPERTIES

Weight (lb) with Patient	Dimensions (inches)			Natural Frequency (Hz)		
	Width	Depth	Height	FB	SS	V
1,722	37.9	109.9	27.6	7.5	8.0	22.0

The patient table moves horizontally to accommodate different positions and procedures. The system was tested in the normal operating position, with the table centered and a total simulated patient weight of 565lbs.

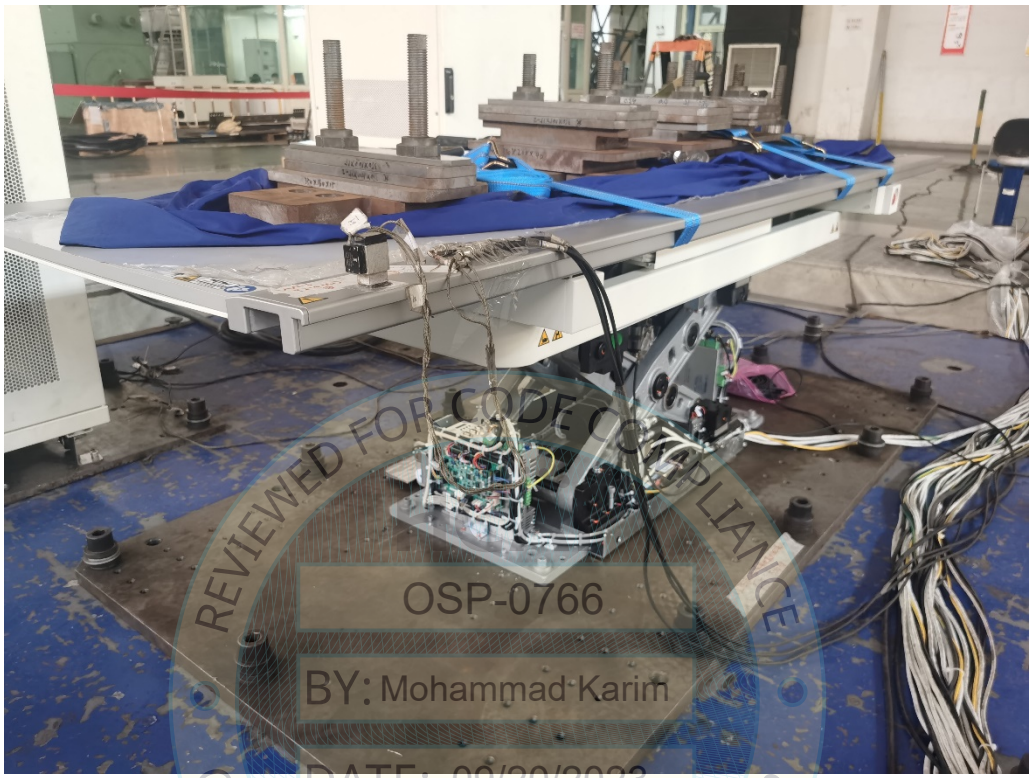
SEISMIC TEST PARAMETERS

Building Code / Test Criteria	S_{DS} (g)	z / h	I_P	A_{FLX-H} (g)	A_{RIG-H} (g)	A_{FLX-V} (g)	A_{RIG-V} (g)
CBC 2022 / ICC-ES AC156	2.00	1.0	1.5	3.20	2.40	-	-
	2.50	0	1.5	-	-	1.67	0.67

Note: The unit was full of contents during testing and remained functional before and after the ICC-ES AC156 test. The unit maintained structural integrity during and after the ICC-ES AC156 test.

UUT-6	UNIT UNDER TEST (UUT) SUMMARY SHEET	WEGAI W.E. GUNDY & ASSOCIATES, INC. STRUCTURAL & EARTHQUAKE ENGINEERING

Mounting Details: Rigid floor mounted with (4) M12 grade 8.8 bolts



Manufacturer: United Imaging Healthcare	**Test Location:** EETI (Suzhou, CHINA)
Component: TBL-2 – uDR780i	**Test Date:** September 2022
Model Number: 78010619	**Report Number:** 1340-05
UUT Function: Motorized patient support	
UUT Description: Patient support for the uDR780i x-ray system.	

UUT PROPERTIES

Weight (lb) with Patient	Dimensions (inches)			Natural Frequency (Hz)		
	Width	Depth	Height	FB	SS	V
1,557	33.3	91.4	34.9	7.0	6.0	6.5

The patient table moves vertically to accommodate different positions and procedures. The system was tested in the normal operating position, with the table at the maximum height and a total simulated patient weight of 565lbs.

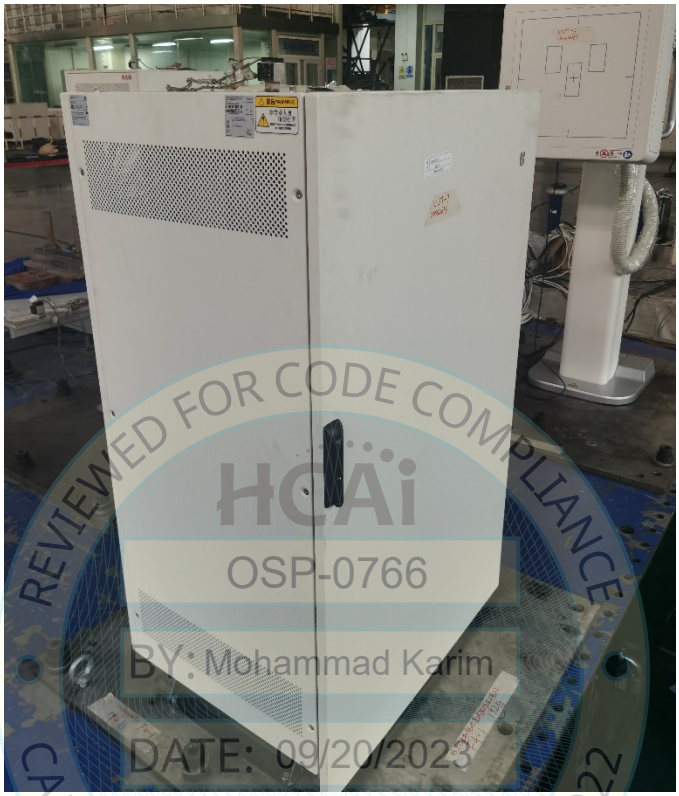
SEISMIC TEST PARAMETERS

Building Code / Test Criteria	S_{DS} (g)	z / h	I_P	A_{FLX-H} (g)	A_{RIG-H} (g)	A_{FLX-V} (g)	A_{RIG-V} (g)
CBC 2022 / ICC-ES AC156	2.00	1.0	1.5	3.20	2.40	-	-
	2.50	0	1.5	-	-	1.67	0.67

Note: The unit was full of contents during testing and remained functional before and after the ICC-ES AC156 test. The unit maintained structural integrity during and after the ICC-ES AC156 test.

UUT-7	UNIT UNDER TEST (UUT) SUMMARY SHEET	WEGAI W.E. GUNDY & ASSOCIATES, INC. STRUCTURAL & EARTHQUAKE ENGINEERING

Mounting Details: Rigid floor mounted with (8) M12 grade 12.9 bolts thru (2) 3mm thick United Imaging U brackets mounted to the cabinet with (2) M12 screws per bracket.



Manufacturer: United Imaging Healthcare	**Test Location:** EETI (Suzhou, CHINA)
Component: PSC – uDR780i	**Test Date:** September 2022
Model Number: 80504613	**Report Number:** 1340-05
UUT Function: Power Supply Cabinet	
UUT Description: Power supply for the uDR780i x-ray system.	

UUT PROPERTIES

Weight (lb)	Dimensions (inches)			Natural Frequency (Hz)		
	Width	Depth	Height	FB	SS	V
375	23.2	32.5	52.5	15.0	13.0	7.0

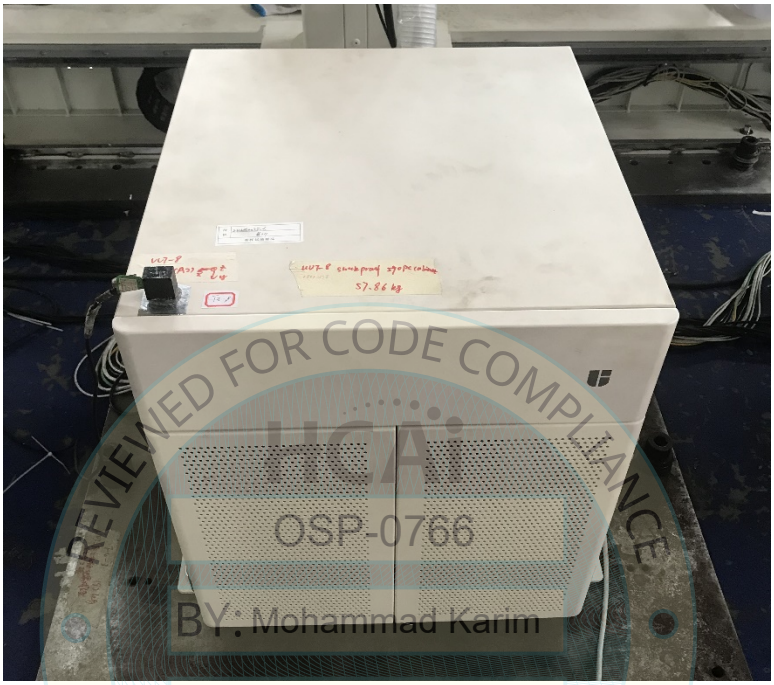
SEISMIC TEST PARAMETERS

Building Code / Test Criteria	S_{DS} (g)	z / h	I_P	A_{FLX-H} (g)	A_{RIG-H} (g)	A_{FLX-V} (g)	A_{RIG-V} (g)
CBC 2022 / ICC-ES AC156	2.00	1.0	1.5	3.20	2.40	-	-
	2.50	0	1.5	-	-	1.67	0.67

Note: The unit was full of contents during testing and remained functional before and after the ICC-ES AC156 test. The unit maintained structural integrity during and after the ICC-ES AC156 test.

UUT-8	UNIT UNDER TEST (UUT) SUMMARY SHEET	WEGAI W.E. GUNDY & ASSOCIATES, INC. STRUCTURAL & EARTHQUAKE ENGINEERING

Mounting Details: Cabinet is Rigid floor mounted with (4) M12 grade 12.9 bolts thru United Imaging seismic anchorage brackets (18042254). Internal PC mounts to the cabinet with United Imaging seismic restraint brackets (18042256).



Manufacturer: United Imaging Healthcare	**Test Location:** EETI (Suzhou, CHINA)
Component: PC Cabinet / PC-uDR596i / uDR780i	**Test Date:** September 2022
Model Number: 18022538 / 60007750	**Report Number:** 1340-05
UUT Function: Imaging System PC	
UUT Description: Component of the uDR x-ray systems.	

UUT PROPERTIES

Weight (lb)	Dimensions (inches)			Natural Frequency (Hz)		
	Width	Depth	Height	FB	SS	V
174	34.2	30.3	35.8	12.5	7.0	7.0
16	7.2	14.3	16.7	NA	NA	NA

Note: The first line above details the UUT Properties for the PC Cabinet and the second line details the UUT properties for the internally mounted PC.

SEISMIC TEST PARAMETERS

Building Code / Test Criteria	S_{DS} (g)	z / h	I_P	A_{FLX-H} (g)	A_{RIG-H} (g)	A_{FLX-V} (g)	A_{RIG-V} (g)
CBC 2022 / ICC-ES AC156	2.00	1.0	1.5	3.20	2.40	-	-
	2.50	0	1.5	-	-	1.67	0.67

Note: The unit was full of contents during testing and remained functional before and after the ICC-ES AC156 test. The unit maintained structural integrity during and after the ICC-ES AC156 test.