



**OFFICE OF STATEWIDE HEALTH PLANNING AND DEVELOPMENT
FACILITIES DEVELOPMENT DIVISION**

**APPLICATION FOR OSHPD SPECIAL SEISMIC
CERTIFICATION PREAPPROVAL (OSP)**

OFFICE USE ONLY

APPLICATION #: **OSP – 0354 – 10**

OSHPD Special Seismic Certification Preapproval (OSP)

Type: New Renewal

Manufacturer Information

Manufacturer: **GE Healthcare**

Manufacturer's Technical Representative: **Tom Farnow**

Mailing Address: **3000 N. Grandview Blvd., Waukesha, WI 53188-1696**

Telephone: **888-406-1101** Email: **Tom.Farnow@gehseismic.com**

Product Information

Product Name: **OPTIMA CT580 & DISCOVERY CT590 SYSTEM**

Product Type: **Computed Tomography (CT) medical diagnostic imaging systems**

Product Model Number: **SEE ATTACHEMENT 1**

(List all unique product identification numbers and/or part numbers)

General Description: **Multiple component systems for the provision of Computed Tomography medical diagnostic imaging. Seismic Certification is limited to the systems and components identified in Attachment 1. Seismic enhancements made to the test units and modifications required to address the anomalies observed during the tests shall be incorporated into the production units.**

Mounting Description: **Rigid base mounted.**

Applicant Information

Applicant Company Name: **EASE LLC**

Contact Person: **JONATHAN ROBERSON, S.E.**

Mailing Address: **5877 Pine Ave, Suite 210, Chino Hills, CA. 91709**

Telephone: **(909) 606-7622** Email: **j.roberson@easeco.com**

I hereby agree to reimburse the Office of Statewide Health Planning and Development review fees in accordance with the California Administrative Code, 2016.

Signature of Applicant:  Date: **May 4, 2016**

Title: **Principal Engineer** Company Name: **EASE LLC**

Access to Safe, Quality Healthcare Environments that Meet California's Diverse and Dynamic Needs





**OFFICE OF STATEWIDE HEALTH PLANNING AND DEVELOPMENT
FACILITIES DEVELOPMENT DIVISION**

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

Company Name: EASE LLC

Name: JONATHAN ROBERSON, S.E. California License Number: S4197

Mailing Address: 5877 Pine Ave, Suite 210, Chino Hills, CA. 91709

Telephone: (909) 606-7622 Email: j.roberson@easeco.com

Supports and Attachments Preapproval

- Supports and attachments are preapproved under OPM- _____
(Separate application for OSHPD Preapproval of Manufacturer's Certification (OPM) of Supports and attachments is required)
- Supports and attachments are not preapproved

Certification Method

- Testing in accordance with: ICC-ES AC156
- Other (Please Specify): _____

Testing Laboratory

Company Name: Environmental Testing Laboratory, Inc.

Contact Name: Brady Richard

Mailing Address: 11034 Indian Trail, Dallas, TX 75229-3513

Telephone: (972) 247-9657 Email: brady@etldallas.com





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Seismic Parameters

Design in accordance with ASCE 7-10 Chapter 13: Yes No

Design Basis of Equipment or Components (F_p/W_p) = SEE ATTACHMENT 1 / TABLE 2

S_{DS} (Design spectral response acceleration at short period, g) = 2.00 (z/h = 1) & 2.60 (z/h = 0)

a_p (In-structure equipment or component amplification factor) = SEE ATTACHMENT 1 / TABLE 2

R_p (Equipment or component response modification factor) = SEE ATTACHMENT 1 / TABLE 2

Ω_0 (System overstrength factor) = SEE ATTACHMENT 1 / TABLE 2

I_p (Importance factor) = 1.5

z/h (Height factor ratio) = 1 ($S_{DS} = 2.00$) & 0 ($S_{DS} = 2.60$)

Equipment or Component Natural Frequencies (Hz) = SEE ATTACHMENT 2

Overall dimensions and weight (or range thereof) = SEE ATTACHMENT 1 / TABLE 1

Equipment or Components @ grade designed in accordance with ASCE 7-10 Chapter 15: Yes No

Design Basis of Equipment or Components (V/W) = _____

S_{DS} (Design spectral response acceleration at short period, g) = _____

S_{D1} (Design spectral response acceleration at 1 second period, g) = _____

R (Response modification coefficient) = _____

Ω_0 (System overstrength factor) = _____

C_d (Deflection amplification factor) = _____

I_p (Importance factor) = 1.5

Height to Center of Gravity above base = _____

Equipment or Component Natural Frequencies (Hz) = _____

Overall dimensions and weight (or range thereof) = _____

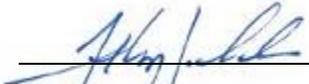
Tank(s) designed in accordance with ASME BPVC, 2015: Yes No

List of Attachments Supporting Special Seismic Certification

Test Report(s) Drawings Calculations Manufacturer's Catalog

Other(s) (Please Specify): SEE ATTACHMENTS 1 & 2

OSHPD Approval (For Office Use Only) – Approval Expires on December 31, 2022

Signature:  Date: May 17, 2016

Print Name: Timothy J. Piland Title: SSE

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

Condition of Approval (if applicable): _____



ATTACHMENT 1: SEISMIC CERTIFIED COMPONENTS

ATTACHMENT PAGE | 1 OF 2

TABLE 1: SEISMIC CERTIFIED SYSTEMS & COMPONENTS

MANUFACTURER		GE HEALTHCARE						
SYSTEM		OPTIMA CT580 / DISCOVERY CT 590 RT / DISCOVERY RT						
COMPONENT	MODEL NO.	DIMENSIONS (IN.)			MAX. WT. (LB.)	MOUNTING	BASIS ^[1]	
		W	D	H				
GANTRIES								
Optima 580 Gantry ^[5]	2374681-14	96.0	39.6	78.4	4000	Floor ^[7]	UUT3 UUT4	
Optima 580 Gantry ^[5]	2374681-15	96.0	39.6	78.4	4000	Floor ^[7]	Same	
Discovery 590 RT Gantry ^[5]	2374681-12	96.0	39.6	78.4	4000	Floor ^[7]	Same	
Discovery 590 RT Gantry ^[5]	2374681-13	96.0	39.6	78.4	4000	Floor ^[7]	Same	
Discovery RT Gantry ^[5]	2374681-17	96.0	39.6	78.4	4000	Floor ^[7]	Same	
PATIENT TABLES								
GT1700V	5122080-11	25.6	93.3	19.2 / 41.3	1059 ^[2]	Floor	UUT-A2	
GT1700 N9	5122080-3	25.6	93.3	19.2 / 41.2	1047	Floor	INT	
GT1700 N9 ED3	5122080-4	25.6	93.3	19.2 / 41.2	1047	Floor	INT	
GT2000	5121647-3	25.6	114.5	19.2 / 41.3	1146 ^[8]	Floor	UUT-A4	
High Capacity Patient Table	5272966-3	26	115.6 / 210.9	20.6 / 41.7	1136.5 ^[3]	Floor	UUT1	
High Capacity Patient Table	5272966-2	26	115.6 / 210.9	20.6 / 41.7	1136.5	Floor	Same	
POWER DISTRIBUTION UNITS								
NGPDU-60	2326492-60	27.6	21.7	41.8	818	Floor	Same	
NGPDU-61	2326492-61	27.6	21.7	41.8	818	Floor	UUT2	
CONSOLES								
NIO Console	5411378-23	18.5	29.1	25.8	161	Floor	UUT-A3	
NIO Console	5411378-25	18.5	29.1	25.8	161	Floor	Same	
NIO Console	5411378-11	18.5	29.1	25.8	159	Floor	INT	
NIO Console	5411378-22	18.5	29.1	25.8	159	Floor	INT	
NIO Console	5411378-24	18.5	29.1	25.8	159	Floor	INT	
NIO Console	5411378-31	18.5	29.1	25.8	159	Floor	INT	
NIO Console	5411378-42	18.5	29.1	25.8	159	Floor	INT	
NIO Console	5411378	18.5	29.1	25.8	182	Floor	INT	
RIO Console	5577708-102	18.5	29.1	25.8	182	Floor	UUT-A5	
OTHER EQUIPMENT								
FWS (Freedom Workspace - Large) tabletop w/ (2) – Eizo LCD Monitors on table-mounted articulated arms	5168666-2	53.1	29.2	26.9 / 35.9	167 ^[4]	Floor ^[6]	UUT-A1	
MOUNTING	FLOOR (RIGID BASE) MOUNT: free-standing, base-mounted configuration with the component rigidly attached to a supporting structure and no lateral support above the base.							
NOTES	<p>1. BASIS:</p> <ul style="list-style-type: none"> • UUT#: Indicates that a test specimen matching these characteristics was tested as part of this testing program. • INT (Interpolate or extrapolate): indicates a model that was not specifically tested, and by which seismic qualification was established through evaluation of testing of other, similar models in the product line. • SAME: Model is physically, mechanically & electrically the same as test specimen. Differences are limited to color, software, GE manufacturing location and/or labeling. <p>2. Patient Table (GT1700V) weight does not include 350 lb. patient load present during testing.</p> <p>3. Patient Table (High Capacity Table) weight does not include 650 lb. patient load present during testing.</p> <p>4. FWS weight includes 2 LCD monitors.</p> <p>5. Seismic qualification limited to gantries manufactured after July 15, 2013 which include RT Integrated Bearing Bracket Part# 5480661 and Main Bearing Part #5134357 or 5112551-2 as included in the test specimens.</p> <p>6. The GE Healthcare seismic bracket model "5394347" used in this testing program shall be installed.</p> <p>7. The 1" OD x 11/16 ID x 2.5" cylindrical spacers present in the test specimen leveling feet as part of the anchorage assembly shall be installed.</p> <p>8. Patient Table (GT2000) weight does not include 550 lb. patient load present during testing</p>							

ATTACHMENT 1: SEISMIC CERTIFIED COMPONENTS

ATTACHMENT PAGE | 2 OF 2

TABLE 2: ASCE 7-10 DESIGN BASIS FOR EQUIPMENT

COMPONENT	MODEL NO.	F_p/W_p	E_v	a_p	R_p	Ω_0
Gantry	2374681-14 2374681-15 2374681-12 2374681-13 2374681-17	2.40	0.52Wp	1	1 ½	1 ½
Patient Table	5122080-11 5122080-3 5122080-4 5121647-3 5272966-3 5272966-2	2.40	0.52Wp	1	1 ½	1 ½
Console	5411378-23 5411378-25 5411378-11 5411378-22 5411378-24 5411378-31 5411378-42 5411378 5577708-102	1.50	0.52Wp	2 ½	6	2
Power Distribution Unit	2326492-60 2326492-61	1.44	0.52Wp	1	2 ½	2
Freedom Workspace	5168666-2	1.44	0.52Wp	1	2 ½	2

ATTACHMENT 2: TEST SPECIMENS

UUT- 1 High Capacity Table	
MANUFACTURER:	GE Hangwei Medical Systems CO., LTD
IDENTIFICATION:	Model No.: 5272966-3 S/N: 320342HM9
DESCRIPTION:	System component of the Optima CT580 System. 650lb simulated patient load.
MOUNTING:	FLOOR MOUNTED (Rigid Base) w/ (4) – 5/8” dia. Bolts



PROPERTIES:							
DIMENSIONS (in.)				Weight (lb.)	LOWEST RESONANT FREQUENCY (Hz.)		
Width	Depth	Height	X-Axis		Y-Axis	Z-Axis	
26	115.6 - 210.9	20.6 / 41.7	1136.5	3.4	>50	5.3	

SHAKE TABLE TEST PARAMETERS								
CODE	TEST CRITERIA	S _{DS}	z/h	I _p	A _{FLX-H}	A _{RIG-H}	A _{FLX-V}	A _{RIG-V}
CBC 2016	ICC-ES AC156	2.0	1.0	1.5	3.2	2.4	1.34	0.54
		2.6	0.0		2.6	1.04	1.74	0.70

Unit maintained structural integrity and functionality after the ICC-ES AC 156 test

UUT- 2 NGPDU-61	
MANUFACTURER:	GE Hangwei Medical Systems CO., LTD
IDENTIFICATION:	Model No.: 2326492-61 Serial No.: : 322132HM2
DESCRIPTION:	System component of the Optima CT580 System
MOUNTING:	FLOOR MOUNTED (Rigid Base) w/ (4) – 3/8” dia. Bolts



PROPERTIES:							
DIMENSIONS (in.)				Weight (lb.)	LOWEST RESONANT FREQUENCY (Hz.)		
Width	Depth	Height	X-Axis		Y-Axis	Z-Axis	
27.6	21.7	41.8	818	15.7	19.9	45	

SHAKE TABLE TEST PARAMETERS								
CODE	TEST CRITERIA	S _{DS}	z/h	I _p	A _{FLX-H}	A _{RIG-H}	A _{FLX-V}	A _{RIG-V}
CBC 2016	ICC-ES AC156	2.0	1.0	1.5	3.2	2.4	1.34	0.54
		2.6	0.0		2.6	1.04	1.74	0.70

Unit maintained structural integrity and functionality after the ICC-ES AC 156 test

ATTACHMENT 2: TEST SPECIMENS

UUT- 3 Optima CT580 Gantry								
MANUFACTURER:	GE Hangwei Medical Systems CO., LTD							
IDENTIFICATION:	Model No.: 2374681-14 Serial No.: 331950HM6							
DESCRIPTION:	System component of the Optima CT580 System Features which vary from current production units: <ul style="list-style-type: none"> • RT Integrated Bearing Bracket: Part No. 5480661; • Main Bearing: Part No. 5134357; 							
MOUNTING:	FLOOR MOUNTED (Rigid Base) w/ (4) – 5/8" dia. Bolts. NOTE: The 1"OD x 11/16: ID x 2.5" cylindrical spacers present in the test specimen leveling feet as part of the anchorage assembly shall be installed as a necessary condition of the conclusions and recommendations of this report							
								
PROPERTIES:								
DIMENSIONS (in.)			Weight (lb.)	LOWEST RESONANT FREQUENCY (Hz.)				
Width	Depth	Height		X-Axis	Y-Axis	Z-Axis		
96	39.6	78.4	4000	5.9	34.1	8.1		
SHAKE TABLE TEST PARAMETERS								
CODE	TEST CRITERIA	S _{DS}	z/h	I _p	A _{FLX-H}	A _{RIG-H}	A _{FLX-V}	A _{RIG-V}
CBC 2016	ICC-ES AC156	2.0 2.6	1.0 0.0	1.5	3.2 2.6	2.4 1.04	1.34 1.74	0.54 0.70
Unit maintained structural integrity and functionality after the ICC-ES AC 156 test								

UUT- 4 Optima CT580 Gantry								
MANUFACTURER:	GE Hangwei Medical Systems Co., LTD.							
IDENTIFICATION:	Model No.: 2374681-14 Serial No.: 338839HM4							
DESCRIPTION:	System component of the Optima CT580 System Features which vary from current production units: <ul style="list-style-type: none"> • RT Integrated Bearing Bracket: Part No. 5480661 • Main Bearing: Part No. 5112551-2 							
MOUNTING:	FLOOR MOUNTED (Rigid Base) w/ (4) – 5/8" dia. Bolts. NOTE: The 1"OD x 11/16: ID x 2.5" cylindrical spacers present in the test specimen leveling feet as part of the anchorage assembly shall be installed as a necessary condition of the conclusions and recommendations of this report							
								
PROPERTIES:								
DIMENSIONS (in.)			Weight (lb.)	LOWEST RESONANT FREQUENCY (Hz.)				
Width	Depth	Height		X-Axis	Y-Axis	Z-Axis		
96	39.6	78.4	3993.6	5.6	35.9	14.5		
SHAKE TABLE TEST PARAMETERS								
CODE	TEST CRITERIA	S _{DS}	z/h	I _p	A _{FLX-H}	A _{RIG-H}	A _{FLX-V}	A _{RIG-V}
CBC 2016	ICC-ES AC156	2.0 2.6	1.0 0.0	1.5	3.2 2.6	2.4 1.04	1.34 1.74	0.54 0.70
Unit maintained structural integrity and functionality after the ICC-ES AC 156 test								

ATTACHMENT 2: TEST SPECIMENS

UUT-A1 Freedom Workspace – Large w/ 2 LCD monitors									
MANUFACTURER:		GE Healthcare							
IDENTIFICATION:		Model No. 5168666-2							
DESCRIPTION:		System component of the Discovery 610 PET/CT System Larger variant of the Freedom Workspace table w/ (2)-EIZO LCD Monitors mounted to articulated arms							
MOUNTING:		Rigid Base (Floor) mounted using GE Healthcare seismic bracket Model No. 5394347 w/ (4) – 3/8" Dia Cap bolts to aluminum interface plate.							
PROPERTIES:									
DIMENSIONS (in.)					Weight (lb.)	LOWEST RESONANT FREQUENCY (Hz.)			
Width	Depth	Height				X-Axis	Y-Axis	Z-Axis	
53.1	29.2	35			167	6.1	3.9	3.9	
SHAKE TABLE TEST PARAMETERS									
CODE	TEST CRITERIA	S _{DS}	z/h	I _P	A _{FLX-H}	A _{RIG-H}	A _{FLX-V}	A _{RIG-V}	
CBC 2016	ICC-ES AC156	2.0 2.6	1.0 0.0	1.5	3.2 2.6	2.4 1.04	1.34 1.74	0.54 0.70	
Unit maintained structural integrity and functionality after the ICC-ES AC 156 test									



UUT- A2 GT1700V Table									
MANUFACTURER:		GE Hangwei Medical Systems Co., LTD							
IDENTIFICATION:		Model No.: 5122080-11							
DESCRIPTION:		System component of the Optima CT660 System 350 lb. simulated patient load.							
MOUNTING:		Rigid Base (Floor) mounted using (4) – 5/8" dia. hex head bolts to interface plate.							
PROPERTIES:									
DIMENSIONS (in.)					Weight (lb.)	LOWEST RESONANT FREQUENCY (Hz.)			
Width	Depth	Height				Transverse-Axis	Longitudinal-Axis	Vertical-Axis	
25.6	93.3	19.2 / 41.2			1059	3.9	15.2	14.2	
SHAKE TABLE TEST PARAMETERS									
CODE	TEST CRITERIA	S _{DS}	z/h	I _P	A _{FLX-H}	A _{RIG-H}	A _{FLX-V}	A _{RIG-V}	
CBC 2016	ICC-ES AC156	2.0 2.6	1.0 0.0	1.5	3.2 2.6	2.4 1.04	1.34 1.74	0.54 0.70	
Unit maintained structural integrity and functionality after the ICC-ES AC 156 test									



ATTACHMENT 2: TEST SPECIMENS

UUT- A3		NIO Console						
MANUFACTURER:		GE Hangwei Medical Systems Co., LTD						
IDENTIFICATION:		Model No.: 5411378-11 (on label)						
		Model No.: 5411378-23 (as configured w/ GPU card)						
DESCRIPTION:		System component of the Optima CT580 System Manufactured unit was Model No. 5411378-11. Prior to testing a GPU card added to the test specimen, transforming it to Model No. 5411378-23.						
MOUNTING:		Rigid Base (Floor) Mounted using (4) - 3/8" dia. grade 8 Allen head cap screw to aluminum interface plate.						
PROPERTIES:								
DIMENSIONS (in.)			Weight (lb.)	LOWEST RESONANT FREQUENCY (Hz.)				
Width	Depth	Height		Side-Axis	Front-Axis	Vertical-Axis		
18.5	29.1	25.8	161	12.2	16.8	9.9		
SHAKE TABLE TEST PARAMETERS								
CODE	TEST CRITERIA	S _{DS}	z/h	I _P	A _{FLX-H}	A _{RIG-H}	A _{FLX-V}	A _{RIG-V}
CBC 2016	ICC-ES AC156	2.0	1.0	1.5	3.20	2.40	1.54	0.54
		2.6	0.0		2.60	1.04	1.74	0.70
Unit maintained structural integrity and functionality after the ICC-ES AC 156 test								

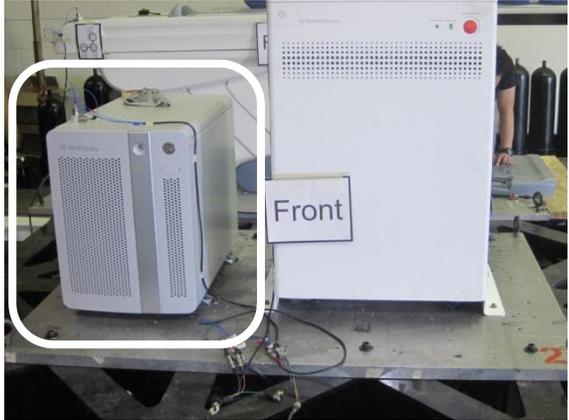


UUT- A4		GT2000 Patient Table						
MANUFACTURER:		GE Hangwei Medical Systems CO. LTD.						
IDENTIFICATION:		Model No.: 5121647-3						
DESCRIPTION:		System Component of the LightSpeed VCT System GT2000 N9 Patient Table 550 lb. simulated patient load. Seismic Kit						
MOUNTING:		Floor: (4) – 5/8" dia GR 8 hex head bolts (torqued to 60 lb-ft) w/ GEHC supplied patient table foot assembly.						
PROPERTIES:								
DIMENSIONS (in.)			Weight (lb.)	LOWEST RESONANT FREQUENCY (Hz.)				
Width	Depth	Height		Transverse-Axis	Longitudinal-Axis	Vertical-Axis		
25.6	114.5	19.2 / 41.3	1146	2.7	7.1	5.7		
SHAKE TABLE TEST PARAMETERS								
CODE	TEST CRITERIA	S _{DS}	z/h	I _P	A _{FLX-H}	A _{RIG-H}	A _{FLX-V}	A _{RIG-V}
CBC 2016	ICC-ES AC156	2.0	1.0	1.5	3.2	2.4	1.34	0.54
		2.5	0.0		2.5	1.0	1.68	0.68
Unit maintained structural integrity and functionality after the ICC-ES AC 156 test								



ATTACHMENT 2: TEST SPECIMENS

ATTACHMENT PAGE | 5 OF 5

UUT- A5		RIO Console						
<i>MANUFACTURER:</i>		GE Medical Systems, LLC						
<i>IDENTIFICATION:</i>		Model No.: 5577708-102						
		S/N: 424057CN8						
<i>DESCRIPTION:</i>		System component of the Optima CT660 System						
<i>MOUNTING:</i>		Rigid Base (Floor) Mounted using (4) - 3/8" dia. socket head bolts to aluminum interface plate.						
								
<i>PROPERTIES:</i>								
DIMENSIONS (in.)			Weight (lb.)	LOWEST RESONANT FREQUENCY (Hz.)				
Width	Depth	Height		Front-Axis	Side-Axis	Vertical-Axis		
18.5	29	25.8	175.5	21.8	13.5	13.6		
<i>SHAKE TABLE TEST PARAMETERS</i>								
CODE	TEST CRITERIA	S _{DS}	z/h	I _P	A _{FLX-H}	A _{RIG-H}	A _{FLX-V}	A _{RIG-V}
CBC 2016	ICC-ES AC156	2.0 2.6	1.0 0.0	1.5	3.2 2.6	2.4 1.04	1.34 1.74	0.54 0.70
Unit maintained structural integrity and functionality after the ICC-ES AC 156 test								