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@gehcseismic.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 incorporated into the test units observed during the tests shall be incorporated into the certified units.

Mounting Description: Rigid Base mounted (i.e. floor 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 20, 2016

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

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

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) = SEE ATTACHMENT 1 / TABLE 2

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) = SEE ATTACHMENT 1 / TABLE 2

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: January 3, 2019

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

TABLE 1: SEISMIC CERTIFIED SYSTEMS & COMPONENTS

MANUFACTURER	**GE HEALTHCARE**
SYSTEM	**OPTIMA CT580 / DISCOVERY CT 590 RT / DISCOVERY RT**

COMPONENT	MODEL NO.	DIMENSIONS (IN.) W	D	H	MAX. WT. (LB.)	MOUNTING	BASIS [1]
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
Discovery RT Gantry [5]	2374681-18	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 [3]	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
Open Console 16 (TangE)	5941604-10	15.7	26.4	22.7	133	Floor	1806-5
RT Open Console with Z840	5941604-11	15.7	26.4	22.7	133	Floor	SAME
RT Open Console with Z840	5941604-20	15.7	26.4	22.7	133	Floor	SAME
OTHER EQUIPMENT							
Freedom Workspace (FWS) – 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.

Table continues next page

MANUFACTURER	**GE HEALTHCARE**
SYSTEM	**OPTIMA CT580 / DISCOVERY CT 590 RT / DISCOVERY RT**
NOTES	1. BASIS: • 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. 2. Patient Table (GT1700V) weight does not include 350 lb. patient load present during testing. 3. Patient Table (High Capacity Table) weight does not include 650 lb. patient load present during testing. 4. FWS weight includes 2 LCD monitors. 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. 6. The GE Healthcare seismic bracket model "5394347" used in this testing program shall be installed. 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. 8. Patient Table (GT2000) weight does not include 550 lb. patient load present during testing

TABLE 2: ASCE 7-10 DESIGN BASIS FOR EQUIPMENT

COMPONENT	MODEL NO.	S_{DS}	z/h	F_P/W_P	a_P	R_P	Ω_0
Gantry	2374681-14 2374681-15 2374681-12 2374681-13 2374681-17 2374681-18	2.0 2.6	1 0	2.40 1.17	1	1 ½	1 ½
Patient Table	5122080-11 5122080-3 5122080-4 5121647-3 5272966-3 5272966-2	2.0 2.6	1 0	2.40 1.17	1	1 ½	1 ½
Console	5411378-23 5411378-25 5411378-11 5411378-22 5411378-24 5411378-31 5411378-42 5411378 5577708-102	2.0 2.6	1 0	1.50 1.17	2 ½	6	2
Console	5941604-10 5941604-11 5941604-20	2.0 2.5	1 0	1.44 1.13	1	2 ½	2
Power Distribution Unit	2326492-60 2326492-61	2.0 2.6	1 0	1.44 1.17	1	2 ½	2
Freedom Workspace	5168666-2	2.0 2.6	1 0	1.44 1.17	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 2.6	1.0 0.0	1.5	3.20	2.40	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 2.6	1.0 0.0	1.5	3.20	2.40	1.74	0.70

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

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: • 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	3.20	2.40	1.74	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: • 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	3.20	2.40	1.74	0.70

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

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.)				LOWEST RESONANT FREQUENCY (Hz.)		
Width	Depth	Height	Weight (lb.)	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	3.20	2.40	1.74	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.)				LOWEST RESONANT FREQUENCY (Hz.)		
Width	Depth	Height	Weight (lb.)	Transverse-Axis	Longitudinal-Axis	Vertical-Axis
25.6	93.3	19.2 / 41.2	1059	3.9	15.2	14.2

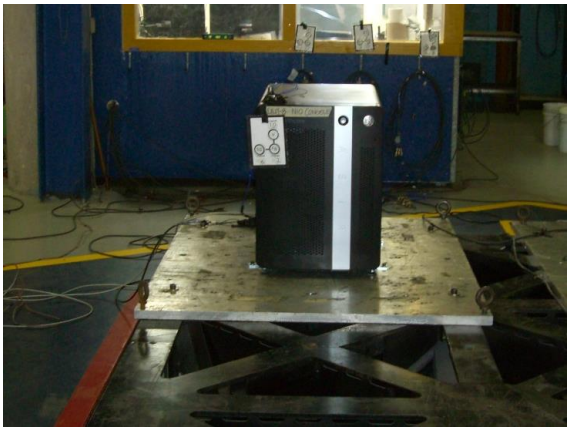
SHAKE TABLE TEST PARAMETERS

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	3.20	2.40	1.74	0.70

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

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.)				LOWEST RESONANT FREQUENCY (Hz.)		
Width	Depth	Height	Weight (lb.)	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 2.6	1.0 0.0	1.5	3.20	2.40	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:

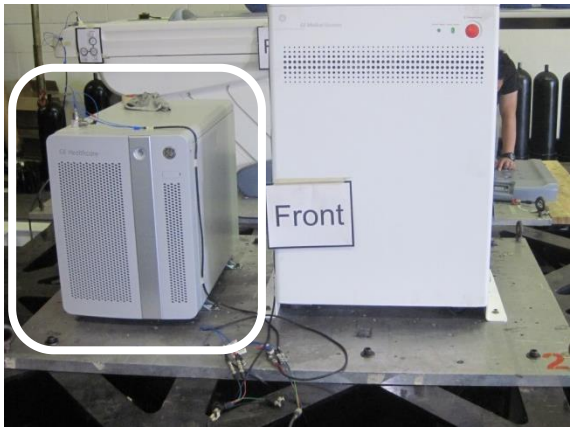
DIMENSIONS (in.)				LOWEST RESONANT FREQUENCY (Hz.)		
Width	Depth	Height	Weight (lb.)	Transverse-Axis	Longitudinal-Axis	Vertical-Axis
25.6	114.5	19.2 / 41.3	1146	2.7	7.1	5.7

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 2.5	1.0 0.0	1.5	3.2	2.4	1.68	0.68

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

UUT- A5	RIO Console
MANUFACTURER:	GE Medical Systems, LLC
IDENTIFICATION:	Model No.: 5577708-102
	S/N: 424057CN8
DESCRIPTION:	System component of the **Optima CT660 System**
MOUNTING:	Rigid Base (Floor) Mounted using (4) - 3/8" dia. socket head bolts to aluminum interface plate.



PROPERTIES:

DIMENSIONS (in.)				LOWEST RESONANT FREQUENCY (Hz.)		
Width	Depth	Height	Weight (lb.)	Front-Axis	Side-Axis	Vertical-Axis
18.5	29	25.8	175.5	21.8	13.5	13.6

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	2.4	1.74	0.70

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

ATTACHMENT 2: TEST SPECIMENS

1806-5	**Optima CT540 Open Console**
MANUFACTURER:	GE Healthcare
IDENTIFICATION:	Model No.: 5941604-10
DESCRIPTION:	Component of the Optima CT 540 system. "Open" console style
MOUNTING:	Rigid Base (Floor) mounted using: GE console to floor mounting assembly (3 locations total): - Bracket (P/N 5357148-8) each w/ - (2) – M6 x 16 10.9 Class bolts (Torque = 7.9 N-m) (P/N 2262896-30) - (2) – Flat washers (P/N 2001-M8-02) - 3/8" dia. ASTM A574 Socket Head Cap Screw w/ washer.

DIMENSIONS (in.)				LOWEST RESONANT FREQUENCY (Hz.)		
Width	Depth	Height	Weight (lb.)	Side-Axis	Front-Axis	Vert-Axis
15.7	26.4	22.7	132.5	14.4	32.2	>50

ICC-ES AC156 SHAKE TABLE TEST PARAMETERS						CODE: 2016 CBC
S_{DS} (G)	z/h	I_P	A_{FLX-H} (G)	A_{RIG-H} (G)	A_{FLX-V} (G)	A_{RIG-V} (G)
2.0 2.5	1 0	1.5	3.2	2.4	1.68	0.68

Unit satisfied AC156 requirements for structural integrity and manufacturer requirements for functionality after AC156 test.