



DEPARTMENT OF HEALTH CARE ACCESS AND INFORMATION
OFFICE OF STATEWIDE HOSPITAL PLANNING AND DEVELOPMENT

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

OFFICE USE ONLY

APPLICATION #: OSP-0826

HCAI Special Seismic Certification Preapproval (OSP)

Type: New Renewal

Manufacturer Information

Manufacturer: BSD Builders, Inc.

Manufacturer's Technical Representative: Jeff Blair

Mailing Address: 8369 Vickers Street #100, San Diego, CA 92111

Telephone: (858) 657-9186 Email: Jeff@BSDBuilders.com

Product Information

Product Name: BSD SSC Microgrid Cogeneration System

Product Model Number(s): BSD SSC 100-420, BSD-SSC-FSS-34MSCF.

Product Category: Emergency and Standby Power Systems

Product Sub-Category: Generators

General Description: Microgrid Cogeneration System consisting of Cogen Power Plant & Fuel Storage System.

Mounting Description: Base Mounted Rigid -

Tested Seismic Enhancements: None

Applicant Information

Applicant Company Name: BSD Builders, Inc.

Contact Person: Jeff Blair

Mailing Address: 8369 Vickers Street #100, San Diego, CA 92111

Telephone: (858) 657-9186 Email: Jeff@BSDBuilders.com

Title: President



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

Company Name: JUNKER ENGINEERING GROUP
Name: Dan Junker California License Number: S6178
Mailing Address: 8950 Jefferson Ave, La Mesa, CA 91941
Telephone: (619) 606-5058 Email: dan@junkereng.com

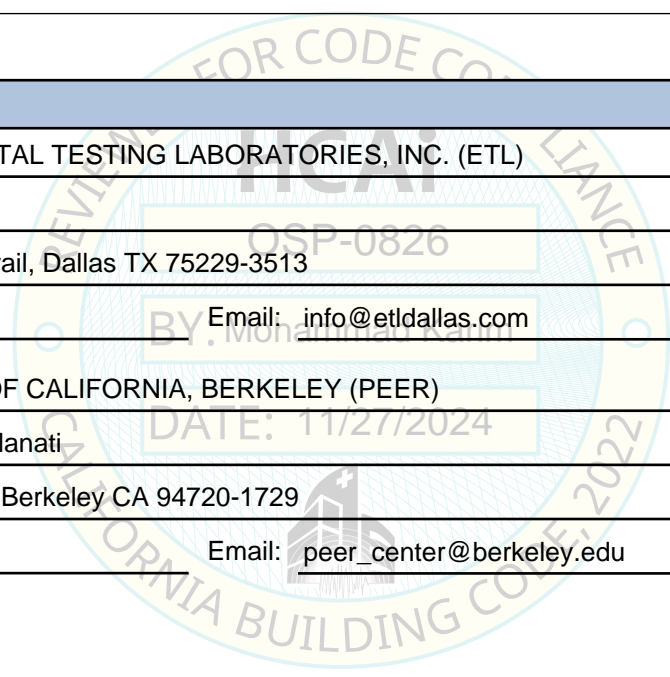
Certification Method

GR-63-Core ICC-ES AC156 IEEE 344 IEEE 693 NEBS 3
 Other (Please Specify): _____

Testing Laboratory

Company Name: ENVIRONMENTAL TESTING LABORATORIES, INC. (ETL)
Contact Person: Jeremy Lange
Mailing Address: 11034 Indian Trail, Dallas TX 75229-3513
Telephone: (972) 247-9657 Email: info@etldallas.com

Company Name: UNIVERSITY OF CALIFORNIA, BERKELEY (PEER)
Contact Person: Amarnath Kasalanati
Mailing Address: 325 Davis Hall, Berkeley CA 94720-1729
Telephone: (510) 642-3437 Email: peer_center@berkeley.edu





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Seismic Parameters

Design Basis of Equipment or Components (F_p/W_p) = 1.88 (Power Plant with Internal Isolators), 1.13 (Fuel Storage System)

SDS (Design spectral response acceleration at short period, g) = 2.5

a_p (Amplification factor) = 2.5 (Power plan with internal isolators), 1.0 (Fuel Storage System)

R_p (Response modification factor) = 2.0 (Power plan with internal isolators), 2.5 (Fuel Storage System)

Ω_0 (System overstrength factor) = 2.0

I_p (Importance factor) = 1.5

z/h (Height ratio factor) = 0

Natural frequencies (Hz) = See Attachment

Overall dimensions and weight = See Attachment

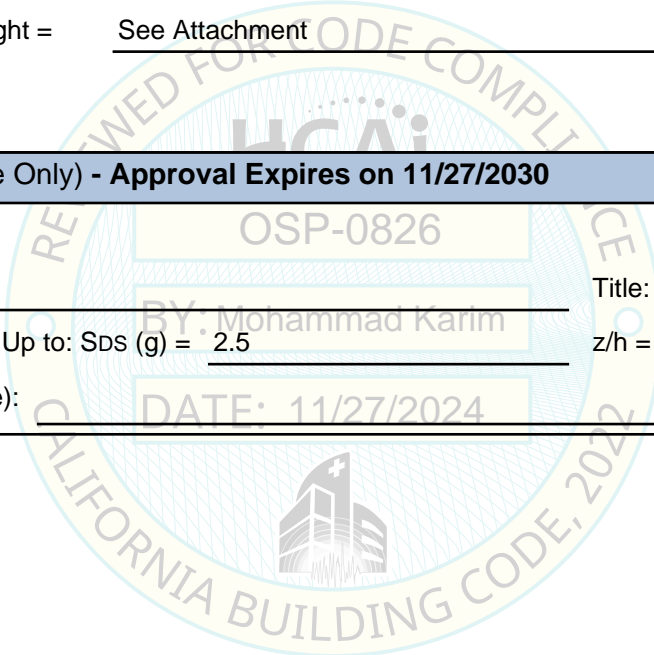
HCAI Approval (For Office Use Only) - Approval Expires on 11/27/2030

Date: 11/27/2024

Name: Mohammad Karim Title: Supervisor, Health Facilities

Special Seismic Certification Valid Up to: SDS (g) = 2.5 z/h = 0

Condition of Approval (if applicable): DATE: 11/27/2024



SPECIAL SEISMIC CERTIFICATION CERTIFIED SUBCOMPONENT SUMMARY



Manufacturer Various, See Below
Product Type Microgrid Cogeneration System
Model Line BSD SSC Power Plant
Table Description Certified Sub-Components

Table 2

Construction Summary	Certification Parameters
Construction as described below.	Building Code: CBC 2022 Component Importance Factor: $I_p = 1.5$ $S_{Ds} = 2.5g @ z/h = 0$

Mounting Summary	Notes
Mounted on component.	

Manufacturer & Product Line	Model Number	Max Dimensions (in)			Max Weight (lbs.)	Notes	UUT
		Length	Width	Height			
Natural Gas Generators Subcomponents							
Enclosure							
2G Energy AG	8m Avus500+	315	118	118	16,535	Steel container with 3.425" panels, insulated with sound dampening mineral glass and 2-hour fire-protection	1, 2
Alternator							
Leroy-Somer	LSA 44.3 L10 / 4p	32	22.5	25.5	439	Steel frame, cast-iron flanges and shields, ip 23 protection rating	Extrapolated
	LSA 46.3 S4 / 4p	35	22.5	30	888		2
	LSA 47.3 VS3 / 4p	40	28	32	1392		1
Load Bank							
Crestchic	DC Load Bank	40	34.5	27	265	20" Diameter fan, stainless steel fins, 3-phase	1, 2
Silencer							
Discom Exhaust Technology	L25	56	30	30	496	Primary Silencer; S235JR steel	1,2
	L45	87	24	24	540	Secondary Silencer; S235JR steel	1,2
Generator							
2G Energy AG	Aura 404	126	39	76	7,165	Cast-iron engine block & cylinder head, copper-brass oil cooler, stainless steel & brass inner cooler	Extrapolated
	Aura 406	157	44	83	9,667		Extrapolated
	Aura 408	160	52	91	12,258		2
	Aura 412	179	52	91	14,191		1
Gas Train							
Dungs Combustion Controls Heat Engine Base	50045-00238	27.5	12	10	108	Galvanized steel shut-off valve, cat-aluminum gas pressure regulator, cast-iron housing	Extrapolated
	50045-00239	32	12	10	110		2
	50045-00240	35	12	11	117		1
Ventilation Fan							
Ziehl-Abegg	FC063	32	10	32	20	Aluminum die-cast blades, 3-phase fan, diameter= 27.75"	1,2
Radiator							
Friga-Bohn FC Neostar Axial Fan Dry Cooler	FCH SN 08D P02 B2-1C-50V-M60-SCU	79	91	52.5	925	Two-speed motor, galvanized sheet metal, 2 26" diameter fans	2
	FC PN 06D P04 A3- 1C-134V	112	91	52.5	1430	Two-speed motor, galvanized sheet metal, 4 26" diameter fans	1
Catalyst							
Interkat Catalyst	61014-26611	13	13	5	27.3	Stainless steel 304	Extrapolated
	61014-26612	14	14	5	29.2		Extrapolated
	61014-26613	15	15	5	30.5		2
	61014-26614	18	18	5	41.9		1

SPECIAL SEISMIC CERTIFICATION CERTIFIED SUBCOMPONENT SUMMARY



Manufacturer Various, See Below
Product Type BSD SSC Fuel Storage System
Model Line: BSD SSC FSS
Table Description Certified Sub-Components

Table 3

Construction Summary	Certification Parameters
Construction as described below.	Building Code: CBC 2022 Component Importance Factor: $I_p = 1.5$ $S_{DS} = 2.5g @ z/h = 1.0$

Mounting Summary	Notes
Mounted on component.	

Manufacturer	Model Number	Max Dimensions (in)			Weight (lbs.)	Notes	UUT
		Length	Width	Height			
Fuel Tank Assembly Subcomponents							
Enclosure							
Hydria	NA	58	71	162	3,850	Carbon steel frame, 12 ga stainless steel sheet metal	3 & 4
Gas Tank							
Hydria	CAT1502 105	46.5	46.5	132	1,200	Carbon fiber tank, 1.25" thick wall	3 & 4
Heat Exchanger							
Hydria	SCBP-HX	36	25	25	1,015	Carbon steel	3 & 4
Regulator							
Swagelok	RSN2-02-LLK	-	-	-	3	3,600 PSI to 2,800 PSI; Stainless steel	3 & 4
Swagelok	RSHN6-02-3-LLK-GN2	-	-	-	5	2,800 PSI to 100 PSI; Stainless steel	3 & 4
Belgas	P301H4008043F0	-	-	-	16	100 PSI to 5 PSI; Cast-iron body, aluminum lower casing	3 & 4
Pressure Relief Valve							
Crosby	951100MFA	-	-	-	7	Pressure Relief, Direct Spring Oper Type, 0.5"X1" MXF NPT, Setpoint: 125 PSIG, ASME8 Orifice; Stainless steel base, carbon steel cylinder	3 & 4
	981105MFA	-	-	-	33	Pressure Relief, Direct Spring Oper Type, 1.5"X2" MXF NPT, Setpoint: 7 PSIG, ASME 8 Orifice; Stainless steel base, carbon steel cylinder	3 & 4
Particulate Filter							
Parker	FFC-116-10	-	-	-	2	Filter, Particulate/Coalescent, 40-micron, 4500 psig min Rating; Stainless steel	3 & 4
Pressure Sensors							
Core Sensors	CS50-2A02000PS4Z000 1-01	-	-	-	1	Pressure range 0-200psi. Output: 4-20mA, Supply 10-28 VDC; Stainless steel	3 & 4
	CS50-2A05000PS4Z000 2-02	-	-	-	1	Pressure range 0-5000 psi. Output: 4-20mA, Supply 10-28 VDC; Stainless steel	3 & 4
Temperature Probe							
Sandelius Instruments	RTD	-	-	-	1	Platinum, Max temp 500°F	3 & 4

SPECIAL SEISMIC CERTIFICATION UNIT UNDER TEST (UUT) DESCRIPTION

Manufacturer: BSD Builders, Inc.
Model Line: Microgrid Cogeneration System
Model Number: BSD SSC 420 Serial #: G6463

UUT **1**

Construction Summary:

Steel container with 3.425" thick insulated wall panels. Certified component construction shall be identical to construction of UUT's.

Options Summary:

Container: 8m Avus500+, **Generator:** 2G Energy Aura 412, **Gas Train:** Heat Engine Base 50045-00240, **Alternator:** Leroy-Somer LSA 47.3 VS3 / 4p, **Load Bank:** Crestchic DC Load Bank, **Silencers:** Discom Exhaust Technology L256 & L45, **Ventilation Fan:** Ziehl-Abegg FC063 **Radiator:** Friga-Bohn FC PN 06D P04 A3- 1C-134V, **Catalyst:** Interkat 61014-26614, **Heat Exchanger:** GEA WTT Plate Heat Exchanger 20212135-5

Test Parameters:

Building Code: CBC 2022
Component Importance Factor: $I_p = 1.5$
Test Criteria: AC-156
Test Report:
PEER # 2023-238-SQTR-01-00; UUT 1

Mounting Summary:

Rigid floor mounted. Fastened to test fixture using eight (8) manufacturer provided angles with 8-3/4" diameter A325 thru bolts.

Notes:

Contents were included in testing per operating conditions.

UUT Image



UUT Properties

Dimensions (in)			Weight (lbs.)	Min. First Natural Frequency (Hz)		
Length	Width	Height		F-B	S-S	Vert
315	118	210	41,000	9.0	8.4	N/A

Unit maintained structural integrity and remained operational

per manufacturer requirement when subjected to AC 156 test with the following test parameters

S_{DS} (g)	z/h	A_{FLX-H} (g)	A_{RIG-H} (g)	A_{FLX-V} (g)	A_{RIG-V} (g)
2.50	0	2.50	1.00	1.67	0.67

SPECIAL SEISMIC CERTIFICATION UNIT UNDER TEST (UUT) DESCRIPTION

Manufacturer: BSD Builders, Inc.
Model Line: Microgrid Cogeneration System
Model Number: BSD SSC 280 Serial #: G6462

UUT **2**

Construction Summary:

Steel container with 3.425" thick insulated wall panels. Certified component construction shall be identical to construction of UUT's.

Options Summary:

Container: 8m Avus500+, **Generator:** 2G Energy Aura 408, **Gas Train:** Dungs Combustion Controls Heat Engine Base 50045-00239, **Alternator:** Leroy-Somer LSA 46.3 S4 / 4p, **Load Bank:** Crestchic DC Load Bank, **Silencers:** Discom Exhaust Technology L256 & L45, **Ventilation Fan:** Ziehl-Abegg FC063, **Radiator:** Friga-Bohn FCH SN 08D P02 B2-1C-50V-M60-SCU, **Catalyst:** Interkat 61014-26613, **Heat Exchanger:** GEA WTT Plate Heat Exchanger 20212135-4

Test Parameters:

Building Code: CBC 2022
Component Importance Factor: $I_p = 1.5$
Test Criteria: AC-156
Test Report:
PEER # 2023-238-SQTR-01-00; UUT 2

Mounting Summary:

Rigid floor mounted. Fastened to test fixture using eight (8) manufacturer provided angles with 8-3/4" diameter A325 thru bolts.

Notes:

Contents were included in testing per operating conditions.

UUT Image



UUT Properties

Dimensions (in)			Weight (lbs.)	Min. First Natural Frequency (Hz)		
Length	Width	Height		F-B	S-S	Vert
315	118	210	39,500	9.6	9.2	N/A

Unit maintained structural integrity and remained operational

per manufacturer requirement when subjected to AC 156 test with the following test parameters

S_{DS} (g)	z/h	A_{FLX-H} (g)	A_{RIG-H} (g)	A_{FLX-V} (g)	A_{RIG-V} (g)
2.50	0	2.50	1.00	1.67	0.67

SPECIAL SEISMIC CERTIFICATION UNIT UNDER TEST (UUT) DESCRIPTION

Manufacturer: BSD Builders, Inc.
Model Line: BSD SSC FSS
Model Number: BSD-SSC-FSS-34MSCF

UUT **3**

Construction Summary:

Steel HSS welded frame with 12 Ga sheet metal panels containing a 48" diameter, 1.25" thick, 11 ft tall carbon fiber tank and subcomponents as listed.

Options Summary:

Gas Tank: Hydria CAT1502 105, **Heat Exchanger:** Hydria SCBP-HX, **Regulators:** Swagelok RSN2-02-LLK & RSHN6-02-3-LLK-GN2, Belgas P301H4008043F0, **Pressure Relief Valves:** Crosby 95100MFA & 981105MFA, **Particulate Filter:** Parker Particulate/Coalescent Filter FCC-116-10, **Pressure Sensors:** Core Sensors CS50-2A02000PS4Z0001-01 & 02, **Temperature Probe:** Sandelius Instruments RTD.

Test Parameters:

Building Code: CBC 2022
Component Importance Factor: $I_p = 1.5$
Test Criteria: AC-156
Test Report:
ETL # 17578 Rev. 1; UUT 1

Mounting Summary:

The unit is mounted to the shake-table with (4) 1" Grade 8 bolts.

Notes:

Contents were included in testing per operating conditions

UUT Image



UUT Properties

Dimensions (in)			Weight (lbs.)	Min. First Natural Frequency (Hz)		
Length	Width	Height		F-B	S-S	Vert
58	71	162	6,124	7.46	11.15	>33.3

Unit maintained structural integrity and remained operational

per manufacturer requirement when subjected to AC 156 test with the following test parameters

S_{DS} (g)	z/h	A_{FLX-H} (g)	A_{RIG-H} (g)	A_{FLX-V} (g)	A_{RIG-V} (g)
2.50	0	2.50	1.00	1.67	0.67

SPECIAL SEISMIC CERTIFICATION UNIT UNDER TEST (UUT) DESCRIPTION

Manufacturer: BSD Builders, Inc.
Model Line: BSD SSC FSS
Model Number: BSD-SSC-FSS-34MSCF

UUT **4**

Construction Summary:

Steel HSS welded frame with 12 Ga sheet metal panels containing a 48" diameter, 1.25" thick, 11 ft tall carbon fiber tank and subcomponents as listed.

Options Summary:

Gas Tank: Hydria CAT1502 105, **Heat Exchanger:** Hydria SCBP-HX, **Regulators:** Swagelok RSN2-02-LLK & RSHN6-02-3-LLK-GN2, Belgas P301H4008043F0, **Pressure Relief Valves:** Crosby 95100MFA & 981105MFA, **Particulate Filter:** Parker Particulate/Coalescent Filter FCC-116-10, **Pressure Sensors:** Core Sensors CS50-2A02000PS4Z0001-01 & 02, **Temperature Probe:** Sandelius Instruments RTD.

Test Parameters:

Building Code: CBC 2022
Component Importance Factor: $I_p = 1.5$
Test Criteria: AC-156
Test Report:
ETL # 17578 Rev. 1; UUT 2

Mounting Summary:

The unit is mounted to the shake-table with (4) 1" Grade 8 bolts.

Notes:

Contents were included in testing per operating conditions

UUT Image



UUT Properties

Dimensions (in)			Weight (lbs.)	Min. First Natural Frequency (Hz)		
Length	Width	Height		F-B	S-S	Vert
58	71	162	6,130	4.76	5.19	>33.3

Unit maintained structural integrity and remained operational

per manufacturer requirement when subjected to AC 156 test with the following test parameters

S_{Ds} (g)	z/h	A_{FLX-H} (g)	A_{RIG-H} (g)	A_{FLX-V} (g)	A_{RIG-V} (g)
2.50	0	2.50	1.00	1.67	0.67