Electrical Reliability Services, Inc.
13350 International Parkway, Unit 102
Jacksonville, FL 32218
T 770-541-6600
F 770-541-6501
www.electricalreliability.com

June 15, 2017

Gainesville Renewable Energy Center LLC
11201 Northwest US Highway 441
Gainesville, FL 32653-8001

Attention: Mr. Michael Buonsignore

Subject: GSU Transformer Testing
Project No. 1011971

Dear Mr. Buonsignore,

Thank you for the opportunity to provide services for you during this project. Our comprehensive report and recommendations are attached. They detail the work we performed, results obtained and provide recommendations for any corrective actions. Please let us know if you have any questions or need additional information.

As an independent third party electrical testing, maintenance and engineering services firm and full member of the InterNational Electrical Testing Association (NETA), Electrical Reliability Services prides itself in the quality of our services and skills of our people. Thanks again for the opportunity to provide you with electrical testing services. If there is anything more we can do for you, please don't hesitate to contact us.

Sincerely,

Frank J Halm
Service Center Manager
Electrical Reliability Services, Inc.

Gainesville Renewable Energy Center LLC

GSU Transformer Testing

VERTIV – ELECTRICAL RELIABILITY SERVICES

Purchase Order No. PO-2017-0176

Project No. 1011971

Report Date 6/15/2017

Site Address 11201 Northwest US Highway 441, Gainesville, FL 32653-8001

Project Leader John D Labrozzi

Approved by Jim Bartolotta - Supervising Engineer

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1. SUMMARY

1.1 This project was initiated by Mr. Michael Buonsignore with Gainesville Renewable Energy Center LLC. All testing was performed by Electrical Reliability Services Field Engineers John D Labrozzi, Greg Perkins, Michael Smith, and Richard Sirmans on May 23, 2017.

1.2 Maintenance tests and inspections help determine if electrical equipment is suitable for use.

1.3 This project involved testing of a transformer.

1.4 All test results are acceptable. Please refer to Section 5 for complete details regarding comments, deficiencies and recommendations.

2. OBJECTIVES

2.1 The transformer in Section 3 of this report has been inspected and tested to help assure their proper and safe operation. Defective or marginal equipment can be identified, repaired, replaced or scheduled for future repairs without costly or unexpected interruptions during normal operating periods.

2.2 The test results are particularly valuable when kept for comparison with past and future maintenance test results. This historic database enables one to predict the probability of equipment failure and thus schedule facility production and financial budgets to accommodate preventive maintenance or repair rather than breakdown maintenance.

3. SERVICE DESCRIPTION

3.1 This project was initiated by Mr. Michael Buonsignore with Gainesville Renewable Energy Center LLC. All testing was performed by Electrical Reliability Services Field Engineers John D Labrozzi, Greg Perkins, Michael Smith, and Richard Sirmans on May 23, 2017.

3.2 Maintenance testing of one (1) Liquid-Filled Transformer, 104MVA / 138.6MVA / 173.3MVA, 141.45Y / 81.666kV - 13.8kV

4. PROCEDURES

The following procedures were followed in the performance of this project:

4.1 Transformer, Liquid-Filled

4.1.1 Visual and Mechanical Inspection

.1 Inspect physical and mechanical condition.

.2 Inspect anchorage and alignment.

.3 Verify the presence of PCB content labeling.

.4 Verify the unit is clean.

.5 Verify that alarm, control, and trip settings on temperature and level indicators are as specified.

.6 Verify tightness of accessible bolted electrical connections.

.7 Verify that cooling fans operate correctly and have appropriate overcurrent protection.

.8 Verify correct liquid level in tanks.

.9 Verify de-energized tap-changer position is left as specified.

4.1.2 Electrical Tests

.1 Perform insulation-resistance tests winding-to-winding and each winding-to-ground for ten minutes. Apply voltage in accordance with manufacturer's published data. In the absence of manufacturer's published data, use industry standard. Calculate dielectric absorption ratio and polarization index.

.2 Perform turns-ratio tests at set tap position.

.3 Perform insulation power-factor or dissipation-factor tests on all windings in accordance with the test equipment manufacturer's published data

.4 Perform power-factor or dissipation-factor tests on each bushing equipped with a power-factor/ capacitance tap. These tests shall be in accordance with the test equipment manufacturer's published data.

.5 Perform excitation-current tests in accordance with test equipment manufacturer's published data.

.6 Measure winding resistance at the designated tap position.

.7 Remove a sample of insulating liquid in accordance with ASTM D 3613 and perform dissolved-gas analysis (DGA) in accordance with ANSI/IEEE C57.104 or ASTM D 3612.

.8 Remove a sample of insulating liquid in accordance with ASTM D 923. The sample shall be tested for the following.

- Dielectric breakdown voltage
- Acid neutralization number
- Specific gravity
- Interfacial tension
- Color
- Visual condition
- Water in insulating liquids.

5. RESULTS, COMMENTS, DEFICIENCIES AND RECOMMENDATIONS

5.1 The Oil Analysis found that the moisture content is unacceptable based on the equipment class and liquid type. **It is recommended to conduct oil resample in three (3) months to monitor this unit. It is also recommended to compare the results with any previous oil analysis results obtained.**

5.2 The Dissolved Gas Analysis (DGA) shows only minor amounts of combustible gas. **It is recommended to conduct oil resample in six (6) months to monitor this unit.**

6. APPENDIX

APPENDIX

Table of Contents
Job # 1011971

Electrical Reliability Services Inc.
Ft Myers Area Service Center
11000 Metro Parkway, Unit 29-30
Ft. Myers, FL 33966
Phone 239-693-7100

CUSTOMER GAINESVILLE RENEWABLE ENERGY CENTER LLC

ADDRESS 11201 NW US HWY 441; GAINESVILLE FL US JOB # 1011971

OWNER GAINESVILLE RENEWABLE ENERGY CENTER LLC; 11201 NW US HWY 441; GAINESVILLE FL US

LOCATION/PLANT

SUBSTATION EQUIPMENT IDENTIFICATION	DATA TEST FORM EQUIPMENT LOCATION	TEST DATA PAGE #
TRANSFORMER SWITCHYARD GSU TRANSFORMER	56201 - TRANSFORMER BASIC INSP & TEST SWICHYARD	1
TRANSFORMER SWITCHYARD GSU TRANSFORMER	93500 - PF TWO-WINDING TRANSFORMERS G.R.E.	3

TRANSFORMER INSPECTION

Electrical Reliability Services Inc.
Ft Myers Area Service Center
11000 Metro Parkway, Unit 29-30
Ft. Myers, FL 33966
Phone 239-693-7100

CUSTOMER GAINESVILLE RENEWABLE ENERGY CENTER LLC PAGE 1
ADDRESS 11201 NW US HWY 441; GAINESVILLE FL US JOB # 1011971
OWNER GAINESVILLE RENEWABLE ENERGY CENTER LLC; 11201 NW US HWY 441; GAINESVILLE FL US
LOCATION/PLANT DATE LAST INSPECTION NA
DATE 5/23/2017 TEMPERATURE 28 °C HUMIDITY 65 % EQPT. LOCATION SWICHYARD
SUBSTATION TRANSFORMER SWITCHYARD EQUIPMENT I.D. GSU TRANSFORMER

NAMEPLATE DATA

DATE OF MANUFACTURE 8-2012
MANUFACTURER PENNSYLVANIA TRANSFORMER TECHNOLOGY SERIAL NO. C-07987-5-1 CLASS ONAN/ONAF/OFAF
CATALOG/SPEC. NO. 19087 kVA 104,000 / 138,600 / 173,300 TRANSFORMER TYPE Modern Sealed Conservator Tank
PHASE 3 TEMPERATURE RISE 65 / °C IMPEDANCE 9.2 % at 104,000 kVA B.I.L. RATING 650 kV PRIMARY 110 kV SEC.
COOLANT Mineral Oil MAIN TANK CAPACITY 89865 Gallons LTC CAPACITY 3765 Gallons AUX. COMPART. CAP. 5745 Gallons
WINDING POLARITY Not Identified WINDING MATERIAL Copper / Copper K FACTOR N/A TOTAL WEIGHT 358595 Pounds
PRIMARY VOLTAGE 141,450 / 81,666 Volts rms ○ DELTA ◉ WYE RATED CURRENT 435 / 580 / 725 AMPERES
SECONDARY VOLTAGE 13,800 / Volts rms ◉ DELTA ○ WYE RATED CURRENT 4,351 / 5,799 / 7,251 AMPERES
TAP VOLTAGES 144,900 | 141,450 | 138,000 | 134,550 | 131,100
TAP / CONNECTIONS A | B | C | D | E
TAP CHANGER: ○ INTERNAL ◉ EXTERNAL TOP VALVE SIZE NA in. BOTTOM VALVE SIZE NA in. TRANSF. LOCATION Outdoor - Ground Level
PRIMARY BUSHINGS Side/Accessible SECONDARY BUSHINGS Top/Accessible Other N/A
PCB CONTENT LESS 1 ppm EPA Label ◉ YES ○ NO ○ N/A CERTIFIED BY NL DATE 8-2012

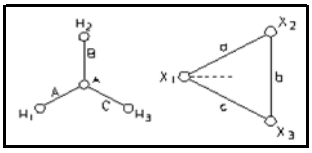
VISUAL INSPECTIONS:

BUSHINGS Good Condition SUPPORT INSULATORS N/A CONNECTIONS Tight
PAINT CONDITION Good RADIATORS Good Condition NO-LOAD TAP CHANGER Good Condition
LOAD TAP CHANGER N/A GAS REGULATOR N/A CABINET HEATERS Operating Normally
LEAKS None
FANS AND CONTROLS Operating Normal NUMBER OF FANS 24 PUMPS AND CONTROLS N/A NUMBER OF PUMPS 0
TAP SETTING (CONNECTIONS): AS FOUND B AS LEFT B GROUNDS
ADDITIONAL EQUIPMENT

GAUGES/ALARMS:

COOLANT TEMPERATURE 24.5 °C COOLANT MAXIMUM TEMPERATURE 60 °C RESET TEMP. GAUGE ☑
COOLANT LEVELS: MAIN TANK Normal LOAD TAP CHANGER LEVEL N/A AUXILIARY COMPARTMENT LEVEL Normal
PRESSURE/VACUUM GAUGE AS FOUND N/A AS LEFT N/A GAS BOTTLE N/A PSIG
OTHER GAUGES

VECTOR DIAGRAM



STANDARD VECTORS
DELTA - WYE: ○
DELTA - DELTA: ○
WYE - WYE: ○
WYE - DELTA: ◉
SINGLE PHASE: ○
NON STANDARD VECTOR: ○

COOLANT SAMPLES

☐ ROUTINE QUALITY ☐ PCB CONTENT
☐ MOISTURE CONTENT ☐ OTHER TESTS N/A
☐ POWER FACTOR 25ºC ☐ OTHER TESTS N/A
☐ POWER FACTOR 100ºC ☐ OTHER TESTS N/A
☐ DISSOLVED GAS ANALYSIS SYRINGE ID

GAS SAMPLES:

%TOTAL COMBUSTIBLE GAS: AS FOUND AS LEFT
%OXYGEN: AS FOUND AS LEFT

EQPT. INVENTORY NO. 5351415, 5351407, 1436 TESTED BY: Sirmans, Rich

TRANSFORMER INSPECTION

Electrical Reliability Services Inc.
Ft Myers Area Service Center
11000 Metro Parkway, Unit 29-30
Ft. Myers, FL 33966
Phone 239-693-7100

CUSTOMER GAINESVILLE RENEWABLE ENERGY CENTER LLC PAGE 2
ADDRESS 11201 NW US HWY 441; GAINESVILLE FL US JOB # 1011971
OWNER GAINESVILLE RENEWABLE ENERGY CENTER LLC; 11201 NW US HWY 441; GAINESVILLE FL US
LOCATION/PLANT
SUBSTATION TRANSFORMER SWITCHYARD EQUIPMENT ID GSU TRANSFORMER

SERIAL NUMBER C-07987-5-1

INSULATION RESISTANCE TESTS

CORE/COIL TEMPERATURE 28 °C TEMPERATURE CORRECTION FACTOR TO 20°C, TCF DRY 1.45 LIQUID 1.75

ALL INSULATION RESISTANCE READINGS ARE IN MEGOHMS									
MINUTES	PRIMARY WINDING TO SECONDARY WINDING AND GROUND			PRIMARY WINDING TO GROUND			SECONDARY WINDING TO GROUND		
	SECONDARY WINDING GROUNDED			SECONDARY WINDING GROUNDED			PRIMARY WINDING GROUNDED		
	TEST VOLTAGE 5.00 KV			TEST VOLTAGE 5.00 KV			TEST VOLTAGE 5.00 KV		
	READING	K2	20°C	READING	K2	20°C	READING	K2	20°C
0.50	1,786	1.75	3,121.928	5,000	1.75	8,740	1,640	1.75	2,866.72
1.00	6,400	1.75	11,187.2	5,580	1.75	9,753.84	2,044	1.75	3,572.912
10.00	18,333	1.75	32,046.084	12,320	1.75	21,535.36	8,200	1.75	14,333.6
DIELECTRIC ABSORPTION	3.583			1.116			1.246		
POLARIZATION INDEX	2.865			2.208			4.012		

DIELECTRIC ABSORPTION = 1 MINUTE RDG. / 30 SECOND RDG.

POLARIZATON INDEX = 10 MINUTE RDG. / 1 MINUTE RDG.

TRANSFORMER TURNS RATIO TESTS ACCEPTABLE PERCENT ERROR : 0.50 %

TAP NUMBER/ PRIMARY TAP VOLTAGE		SECONDARY WINDING VOLTAGE	CALCULATED RATIO	MEASURED RATIO					
				H_1H_0/X_1X_2		H_2H_0/X_2X_3		H_3H_0/X_3X_1	
				MEASURED RATIO	PERCENT ERROR	MEASURED RATIO	PERCENT ERROR	MEASURED RATIO	PERCENT ERROR
B	81,666	13,800	5.9178	5.9276	0.1656	5.9256	0.1318	5.9260	0.1386

WINDING RESISTANCE TESTS

PRIMARY WINDING:

MEASURED RESISTANCE

$H_1 - H_0$	0.1237	OHMS
$H_2 - H_0$	0.1215	OHMS
$H_3 - H_0$	0.1212	OHMS

SECONDARY WINDING:

MEASURED RESISTANCE

$X_1 - X_2$	0.002034	OHMS
$X_2 - X_3$	0.002102	OHMS
$X_3 - X_1$	0.002479	OHMS

COMMENTS:
DEFICIENCIES & RECOMMENDATIONS:

INSULATION TESTS
TWO-WINDING TRANSFORMERS

Electrical Reliability Services Inc.
Ft Myers Area Service Center
11000 Metro Parkway, Unit 29-30
Ft. Myers, FL 33966
Phone 239-693-7100

CUSTOMER: GAINESVILLE RENEWABLE ENERGY CENTER LLC — PAGE: 3
ADDRESS: 11201 NW US HWY 441; GAINESVILLE FL US — JOB #: 1011971
OWNER: GAINESVILLE RENEWABLE ENERGY CENTER LLC; 11201 NW US HWY 441; GAINESVILLE FL US
LOCATION/PLANT: — DATE LAST INSPECTION: NA
DATE: 5/23/2017 — TEMPERATURE: 30 °C — HUMIDITY: 60 % — EQPT. LOCATION: G.R.E.
SUBSTATION: TRANSFORMER SWITCHYARD — EQUIPMENT I.D.: GSU TRANSFORMER

NAMEPLATE DATA

MFR	Penn	CLASS	ONAN/ONAF/ONAF	PHASES	3
SER NO	C-07987-5-1	COOLANT	OIL	REASON	ROUTINE
YEAR	2012	TANK TYPE	SEALED-CONSER	WEIGHT	358595 LB
				WINDING MATERIAL	Cu
				OIL VOLUME	89,865 UG
				OIL TEMP	25 °C
				IMPEDANCE	9.2 %
				WEATHER	PTCLDY
				BIL	650 kV

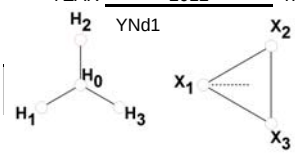


Diagram # 9 (ANSI)

BUSHING NAMEPLATE						
DSG	SERIAL NUM	MFR.	TYPE/CLASS	kV	AMPS	YEAR
H1	1000046361	A-BB	O+	138	1200	2012
H2	1000046363	A-BB	O+	138	1200	2012
H3	1000046359	A-BB	O+	138	1200	2012
H0	1000045965	A-BB	O+C	34.5	1200	2012
X1	1000047634	A-BB	T	25	9000	2012
X2	1000047633	A-BB	T	25	9000	2012
X3	1000047632	A-BB	T	25	9000	2012

	VOLTAGE (kV)		MVA	RATED I	# TAPS	NOMINAL	CHANGER	TAP SETTING
	L-L	L-G						
PRIMARY:	141.45	81.666	104	424.49	1			
SECOND:	13.8		104	4,351.05	1			

COMMENTS:

TRANSFORMER OVERALL TEST SET UP

TRANSFORMER OVERALL TEST RESULTS

☐ ITC ☑ Temp Corr. Table

Test No.	INSULATION TESTED	Test Mode	Test Lead Connections HV	Red	Blue	Gnd	TEST kV	Capacitance C (pF)	POWER FACTOR % Measured	@ 20°C	Corr Factor	DIRECT mA	Watts	IR Auto/Man
1	$C_{HG} + C_{HL}$	GST-GND	H	L		G	10.01	11,399.60			0.980	42.9760	0.7640	/
2	C_{HG}	GSTg-RB	H	L		G	10.00	4,322.10	0.21	0.21	0.980	16.2940	0.3430	G /
3	C_{HL}	UST-R	H	L		G	10.00	7,081.10	0.16	0.16	0.980	26.6950	0.4220	G /
4	C_{HL}'		Test 1 Minus Test 2					7,077.50				26.6820	0.4210	Valid
5	$C_{LG} + C_{HL}$	GST-GND	L	H		G	8.01	26,597.40			0.980	100.2700	1.8440	/
6	C_{LG}	GSTg-RB	L	H		G	8.00	19,518.10	0.20	0.20	0.980	73.5830	1.4380	G /
7	C_{HL}	UST-R	L	H		G	8.00	7,081.60	0.15	0.15	0.980	26.6970	0.4100	G /
8	C_{HL}'		Test 5 Minus Test 6					7,079.30				26.6870	0.4060	Valid
9	C_{HG}'		C_{HG} Minus H Bushings											
10	C_{LG}'		C_{LG} Minus L Bushings											
Oil Test 1	Overall Oil Test	UST-R	L	H		G					0.795			
Oil Test 2	LTC Chamber Oil Test	UST-R	L	H		G					0.795			

EQPT. INVENTORY NO. M4K — TESTED BY: Sirmans, Rich

INSULATION TESTS
TWO-WINDING TRANSFORMERS

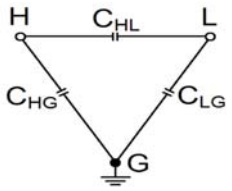
Electrical Reliability Services Inc.
Ft Myers Area Service Center
11000 Metro Parkway, Unit 29-30
Ft. Myers, FL 33966
Phone 239-693-7100

NOTE: SHORT EACH WINDING ON ITSELF

INSULATION RATING KEY
- G = GOOD
- D = DETERIORATED
- I = INVESTIGATE
- B = BAD

- H = HIGH VOLTAGE WINDING
- L = LOW VOLTAGE WINDING
- G = GROUND
- N = NEUTRAL BUSHING

EQUIVALENT CIRCUIT



Transformer - Bushing C1 Tests ☐ **Apply C1 Correction Factor from First Bushing to All Bushing** ☐ **ITC** ☑ **Temp Corr. Table**

Test No.	Bushing Nameplate					Test Mode	TEST kV		Capacitance C (pF)	POWER FACTOR %			DIRECT			IR
	Dsg.	SERIAL #	CAT. #	PF	Cap. (pF)					Measured	@ 20°C	Corr Factor	mA	Watts		
11	H1	1000046361		0.28	430.00	UST-R	2.00		426.05	0.24	0.24	1.000	1.6060	0.0380		G /
12	H2	1000046363		0.28	431.00	UST-R	2.00		427.31	0.24	0.24	1.000	1.6110	0.0380		G /
13	H3	1000046359		0.28	428.00	UST-R	2.00		423.64	0.24	0.24	1.000	1.5970	0.0380		G /
14	H0	1000045965		0.24	447.00	UST-R	2.00		438.90	0.23	0.24	1.030	1.6550	0.0380		G /
15	X1	1000047634		0.27	811.00	UST-R	2.00		800.09	0.25	0.25	0.990	3.0160	0.0750		G /
16	X2	1000047633		0.25	772.00	UST-R	2.00		759.87	0.22	0.22	0.990	2.8650	0.0640		G /
17	X3	1000047632		0.26	770.00	UST-R	2.00		760.28	0.24	0.24	0.990	2.8660	0.0690		G /
18						UST-R										
19						UST-R										

Transformer - Bushing C2 Tests

Test No.	Bushing Nameplate					Test Mode	TEST kV	Capacitance C (pF)	POWER FACTOR %			DIRECT			IR
	Dsg.	SERIAL #	CAT. #	PF	Cap. (pF)				Measured	@ 20°C	Corr Factor	mA	Watts		
20	H1	1000046361		0.28	4,654.00	GSTg-RB	0.50	4,635.40	0.26	0.26	1.000	17.4750	0.4490		G /
21	H2	1000046363		0.27	4,402.00	GSTg-RB	0.50	4,393.40	0.28	0.28	1.000	16.5630	0.4590		G /
22	H3	1000046359		0.29	4,578.00	GSTg-RB	0.50	4,563.70	0.42	0.42	1.000	17.2050	0.7180		G /
23	H0	1000045965		0.18	377.00	GSTg-RB	0.50	385.46	0.35	0.36	1.030	1.4530	0.0510		G /
24	X1	1000047634		0.45	206.00	GSTg-RB	0.50	277.93	0.45	0.45	0.990	1.0480	0.0470		G /
25	X2	1000047633		0.40	210.00	GSTg-RB	0.50	282.68	0.60	0.59	0.990	1.0660	0.0640		G /
26	X3	1000047632		0.45	208.00	GSTg-RB	0.50	279.55	0.37	0.37	0.990	1.0540	0.0390		G /
27						GSTg-RB									

EXCITING CURRENT TESTS

CONNECTIONS:			PHASE A: -			UST-R		PHASE B: -			UST-R		PHASE C: -			UST-R		
	DETC	LTC	TEST kV	L(H) / C (pF)		mA	EQUIV. 10 kV Watts	TEST kV	L(H) / C (pF)		mA	EQUIV. 10 kV Watts	TEST kV	L(H) / C (pF)		mA	EQUIV. 10 kV Watts	IR uto/Ma
39	B		10.10	339.29	L	78.9710	624.45	10.10	347.01	L	77.2130	616.93	10.10	347.32	L	77.1440	616.12	G /

COMMENTS:
DEFICIENCIES & RECOMMENDATIONS:

SDMyers ACTS 4:12 *INTELLIGENT TRANSFORMER MANAGEMENT®*

Date Printed 6/13/2017 **TC# 9437**

Customer	**7247225 Electrical Reliability Service, Inc.**	**City**	Fort Myers, FL	**Location**	
Sub-Name	**GSU**	**Unit No.**		**Other**	

NAMEPLATE DATA

Manufacturer	PENN TRAN	**Equipment Type**	GENERATOR STEP UP XFMR		
Manufacture Date	01/01/2012	**Transformer Class**			
Serial No.	C-07987-5-1	**Impedance %**	0.00		
KVA Rating	104,000	**Phase/Cycle**			
High Voltage	138,000	**Liquid Type**	OIL		
Low Voltage	13,800	**Gallons**	89,865		
Weight		**Other Access**			

ADDITIONAL EQUIPMENT

Radiators		**Conservator Tank**	
Fans		**LTC Compartment**	
Water Cooled		**Bushing Location**	
Oil Pumps		**Breather**	
Top FPV (inch)	0.00	**Hose Length (feet)**	
Bottom FPV (inch)	0.00	**Service Online**	
InsulationType		**Power Available**	

VISUAL INSPECTION

DATE	LEVEL	SAMPLE TEMP	TOP TEMP	P/V	PAINT	LEAKS
05/23/17		29	29			

FIELD SERVICE

DATE	SERVICE

Additional Information

Reason Not Tested

LIQUID SCREEN TEST DATA

DATE	SERVICE	ACID	IFT	DIEL 877	DIEL 1816	GAP	COLOR	SP. GRAV.	VISUAL	SEDIMENT
05/23/17		0.010 AC	42.5 AC	53 AC			0.50 AC	0.890 AC	CLEAR AC	NONE AC

INHIBITOR CONTENT

DATE	PCT. BY WEIGHT

NOTE - TESTING FOR INHIBITOR CONTENT IS USEFUL, SINCE INHIBITOR SLOWS THE AGING RATE OF THE INSULATION SYSTEM.

LIQUID POWER FACTOR

DATE	25 C	100 C

KEY TO ABBREVIATIONS: AC - ACCEPTABLE QU - QUESTIONABLE UN - UNACCEPTABLE RS - RESAMPLE

NOTE: * After a result indicates that the test or service was performed by an outside source.

Customer	**7247225 Electrical Reliability Service, Inc.**	**S/N**	C-07987-5-1		
Sub-Name	**GSU**	**Mfg.**	PENN TRAN	**Gallons**	89,865
Location		**Unit No.**		**KVA**	104,000
				High Volt.	138,000
				Low Volt.	13,800

KARL FISCHER TESTING MOISTURE CONTENT EXPRESSED IN PPM

DATE	AVG. TEMP	PPM	PCT. SATURATION		MOISTURE BY DRY WEIGHT PCT.
05/23/17	34	17	17.6	UN	1.82

RECOMMENDATION RETEST 3 MONTHS
The moisture content is unacceptable based on the equipment class and liquid type. A shorter test interval is recommended to monitor this unit.

FURAN ANALYSIS EXPRESSED IN PPB

DATE	5H2F	2FOL	2FAL	2ACF	5M2F	TOTAL

GAS-IN-OIL ANALYSIS GAS CHROMATOGRAPHY EXPRESSED IN PPM

DATE	HYDROGEN	OXYGEN	NITROGEN	METHANE	CARBON MONOXIDE	CARBON DIOXIDE	ETHANE	ETHYLENE	ACETYLENE	TOTAL COMBUST.	TOTAL GAS
05/23/17	ND	15,826	53,688	10	176	2,368	ND	ND	ND	186	72,068

RECOMMENDATION RETEST 6 MONTHS
A-THE ANALYSIS OF THIS SAMPLE SHOWS ONLY MINOR AMOUNTS OF COMBUSTIBLE GAS. THIS BASELINE INDICATES NORMAL OPERATION.

ICP METALS-IN-OIL EXPRESSED IN PPM

DATE	ALUMINUM	IRON	COPPER

PCB CONTENT EXPRESSED IN PPM

DATE	1242	1254	1260	OTHER	TOTAL

NOTE: * After a result indicates that the test or service was performed by an outside source.