STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
AIRPORTS DIVISION

ADDENDUM NO. 1
TO
SPECIFICATIONS, SPECIFICATIONS, AND PROPOSAL
FOR

MAINTENANCE OF ELECTRICAL EQUIPMENT
LIHUE AIRPORT
PROJECT NO. BK1321-53

OCTOBER 3, 2022

The following is provided for information:

A. RESPONSES TO REQUEST FOR INFORMATION (RFI)

1. Question: Are you able to give us more information on the ATS' and Switchgear?

   Response: Yes, information can be found on the attached Electrical Maintenance Testing Report.

B. ELECTRICAL MAINTENANCE TESTING REPORT

1. The attached Electrical Maintenance Testing Report for the Lihue Airport is provided for your information.

Please acknowledge receipt of this Addendum No.1 by recording the date of its receipt in the space provided on page PF-4 of the Proposal.

JADE T. BUTAY
Director of Transportation

EXHIBIT A

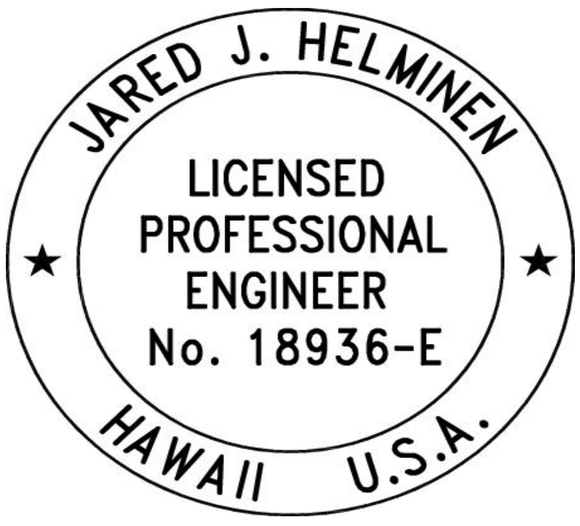
ELECTRO TEST
OAHU, HAWAII

NETA ACCREDITED COMPANY

Lihue Airport

Electrical Maintenance Testing Report

Report Prepared By Jared Helminen, P.E.



Lihue Airport Electrical Maintenance
Customer: American Electric
Dates of Work Performed: 03/21-03/25/2022
Contact: Clark Tyler
Type of Service: Elctrical Maintenance Testing

Summary

Electrical acceptance testing was performed by Electro Test personnel at Lihue Airport and coordinated with aiport personnel. While most equipment is in fair working condition there were multiple deficiencies found and they are listed below.

Deficiencies

1. ATS 1 has burnt out bulbs and some corrosion on the mechanical parts. Recommend replacing bulbs and installing heaters.

2. ATS 2 has a bad circuit to the racking solenoid and the switches at the racking mechanism as well as the permissive switch at the Bypass mechanism should be replaced. This unit also has corrosion.

3. Heaters in ATS 1 and ATS 2 are inoperable. (2) New circuits should be pulled to this location and working heaters should be installed to alleviate moisture and corrosion on these units. This will significantly extend the useful life of these units.

4. Insulation resistance readings on all circuit breakers in the Main Switchboard and Generator Switchboard were very low. It is recommended that heaters be installed to prevent further moisture penetration.

5. The Control Tower (Airfield) ATS failed during testing and needs to be replaced. The bypass unit and transfer coil are both failed. This unit is old and has a date code of 02/2001.

6. The ARFF automatic transfer switch failed previous maintenance cycles and still has not been replaced. The mechanical portion of the switch is in very bad condition and could cause safety concerns going forward.

The contoller is also faulty so the whole switch assembly must be replace as soon as possible.

Please see all attached test forms and feel free to contact us with an questions. A quotation will be provided for correcting deficiencies.

Mahalo,

Jared Helminen, P.E.

Lihue Airport Electrical Maintenance – NETA Testing Results
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ELECTRO TEST
OAHU, HAWAII

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LOW VOLTAGE CIRCUIT BREAKERS

ELECTRO TEST
OAHU, HAWAII

NETA ACCREDITED COMPANY

Insulated Case Circuit Breaker Test and Inspection
G1

Customer **American Electric**		Site **Lihue International Airport**	Agreement Number **ET22-121**
Date **3/22/2022**	Technician **Jared Helminen**	Location **Lihue, HI**	Equipment Tag ID **G1**
Manufacturer **General Electric**		Model **Power Break**	SERIAL NUMBER **AC16367-2**
Test Equipment Used (Calibration Numbers) **MEGGER DDA 1600 (Fluke 1587,AEMC 6240)**		Test Equipment Last Calibration Date **8/20/2020**	Substation **Primary**

Nameplate

Ambient Temperature	25	°C	Trip Unit Type	MVT+		CAT number	THC1616TTEI
Humidity	60	%	Trip Unit Catalog Number	RMS9C122953		Cubicle Code	N/A
Breaker Type	GE Power Breaker		Frame Size	1600	Amps	Sensor Taps	1600
Fuse Catalog Number	N/A						
Counter as Found	N/A		Mounting	Thermal Memory			
Counter As Left	N/A		Draw-Out	ON		ZONE INTERLOCK	OFF
						GF	ON

Inspection

Proper Mounting	Inspected	Pass	No Action Needed	Insulating Members	Inspected	Pass	No Action Needed
Conductors Match Single Line	YES	Pass	No Action Needed	Structural Members	Inspected	Pass	No Action Needed
Feeder Designation Match Drawing	Inspected	Pass	No Action Needed	Contact Fingers	Inspected	Pass	No Action Needed
Casing Intact with no Cracking	Inspected	Pass	No Action Needed	Arcing Contacts	Inspected	Pass	No Action Needed
Bolt Torque Levels Checked	NA/DLRO	Pass	No Action Needed	Arc Chutes	Inspected	Pass	No Action Needed
Breaker Operates Correctly	Inspected	Pass	No Action Needed	Auxiliary Devices	Inspected	Pass	No Action Needed
Frame Size & Trip Unit Correct	Inspected	Pass	No Action Needed				
Terminals Suitable for 75deg C	Inspected	Pass	No Action Needed	Overcurrent Device Battery	Inspected	Pass	No Action Needed

Overall Visual Inspection PASSED INSPECTION

Settings as Found

			Function			Pickup				Delay
	Rating Plug	1600	Long	0.75	X	1600	A	=	1200 A	1
GroundFault	Sensor Tap	1600	Short		X		A	=	0 A	
3W			Instantaneous	10	X	1600	A	=	16000 A	
			Ground Fault	0.2	X	1600	A	=	320 A	3 Out

Settings as Left

			Function			Pickup				Delay
	Rating Plug	1600	Long	0.75	X	1600	A	=	1200 A	1
GroundFault	Sensor Tap	1600	Short	0	X	0	A	=	0 A	0
3W			Instantaneous	10	X	1600	A	=	16000 A	
			Ground Fault	0.2	X	1600	A	=	320 A	3 Out

Timing Tests

Trip Curve (TCC) Number: GES-9913

Function	Test Amps	Current Multiple	Time Band Minimum	Time Band Maximum	As Found seconds	As Left seconds
Long Time	3600	3XIr	8	16	11.42	11.42
	LTPU (amps)					0
Short Time						0
	STPU (amps)					0
Instantaneous	16000	8XIn	0.01	0.07	0.05	0.05
	IPU (amps)					0
Ground Fault	480	1XIn	0.38	0.5	0.39	0.39
	GFPU (amps)					0

Contact Resistance Across Closed Poles

Breaker Current Rating	1600	Amps
Maximum Percent Load	100%	%
Maximum Load	1600	

	Measurements µΩ	Deviation	Deviation Pass or Fail	Overall Pass or Fail
Phase A	38	8.57%	PASS	PASS
Phase B	35	0.00%	PASS	
Phase C	49	40.00%	PASS	

Insulation Resistance

Breaker Voltage Rating	600	VAC Phase to Phase
Minimum Test Voltage	1000	kVDC
Test Voltage Used	1000	kVDC
Test Duration per Reading	60	Seconds

Insulation Temperature	25	°C	
Temperature Correction Factor	1.25		
Minimum Insulation Resistance	100	MΩ	

State	Points	Measurements MΩ	Corrected for °C MΩ	Pass or Fail
Closed	A to B	72	90	PASS
Closed	B to C	50	62.5	PASS
Closed	C to A	70	87.5	PASS
Closed	A to G	65	81.25	PASS
Closed	B to G	52	65	PASS
Closed	C to G	50	62.5	PASS
Open	A Line - Load	185	231.25	PASS
Open	B Line - Load	85	106.25	PASS
Open	C Line - Load	2200	2750	PASS
Any	Control Wiring	2200	2750	PASS

OVERALL PASS/FAIL: PASS

Comments

Deficiencies

ELECTRO TEST
OAHU, HAWAII

NETA ACCREDITED COMPANY

Insulated Case Circuit Breaker Test and Inspection
G2

Customer **American Electric**	Site **Lihue International Airport**	Agreement Number **ET21-121**
Date **3/22/2022** / Technician **Jared Helminen**	Location **Lihue, HI**	Equipment Tag ID **G2**
Manufacturer **General Electric**	Model **Power Break**	SERIAL NUMBER **AC16367-1**
Test Equipment Used (Calibration Numbers) **MEGGER DDA 1600 (Fluke 1587, AEMC 6240)**	Test Equipment Last Calibration Date **8/20/2020**	Substation **Primary**

Nameplate

Ambient Temperature	25	°C	Trip Unit Type	MVT+		CAT number	THC1616TTEI
Humidity	60	%	Trip Unit Catalog Number	RMS9C122953		Cubicle Code	N/A
Breaker Type	GE Power Breaker		Frame Size	1600	Amps	Sensor Taps	1600
Fuse Catalog Number	N/A						
Counter as Found	N/A		Mounting	Thermal Memory			
Counter As Left	N/A		Draw-Out	ON			

ZONE INTERLOCK
GF ALARM ONLY

Inspection

Proper Mounting	Inspected	Pass	No Action Needed	Insulating Members	Inspected	Pass	No Action Needed
Conductors Match Single Line	YES	Pass	No Action Needed	Structural Members	Inspected	Pass	No Action Needed
Feeder Designation Match Drawing	Inspected	Pass	No Action Needed	Contact Fingers	Inspected	Pass	No Action Needed
Casing Intact with no Cracking	Inspected	Pass	No Action Needed	Arcing Contacts	Inspected	Pass	No Action Needed
Bolt Torque Levels Checked	NA/DLRO	Pass	No Action Needed	Arc Chutes	Inspected	Pass	No Action Needed
Breaker Operates Correctly	Inspected	Pass	No Action Needed	Auxiliary Devices	Inspected	Pass	No Action Needed
Frame Size & Trip Unit Correct	Inspected	Pass	No Action Needed				
Terminals Suitable for 75deg C	Inspected	Pass	No Action Needed	Overcurrent Device Battery	Inspected	Pass	No Action Needed

Overall Visual Inspection PASSED INSPECTION

Settings as Found

			Function			Pickup					Delay
GroundFault 3W	Rating Plug	1600	Long	0.75	X	1600	A	=	1200	A	1
	Sensor Tap	1600	Short		X		A	=	0	A	
			Instantaneous	10	X	1600	A	=	16000	A	
			Ground Fault	0.2	X	1600	A	=	320	A	3 Out

Settings as Left

			Function			Pickup					Delay
GroundFault 3W	Rating Plug	1600	Long	0.75	X	1600	A	=	1200	A	1
	Sensor Tap	1600	Short	0	X	0	A	=	0	A	0
			Instantaneous	10	X	1600	A	=	16000	A	
			Ground Fault	0.2	X	1600	A	=	320	A	3 Out

Timing Tests

Trip Curve (TCC) Number: GES-9913

Function	Test Amps	Current Multiple	Time Band Minimum	Time Band Maximum	As Found seconds	As Left seconds
Long Time	3600	3XIr	8	16	11.42	11.42
	LTPU (amps)					
Short Time						
	STPU (amps)					
Instantaneous	16000	8XIn	0.01	0.07	0.05	0.05
	IPU (amps)					
Ground Fault	480	1XIn	0.38	0.5	0.39	0.39
	GFPU (amps)					

Contact Resistance Across Closed Poles

Breaker Current Rating	3200	Amps
Maximum Percent Load	100%	%
Maximum Load	3200	

	Measurements µΩ	Deviation	Deviation Pass or Fail	Overall Pass or Fail
Phase A	31	10.71%	PASS	PASS
Phase B	35	25.00%	PASS	
Phase C	28	0.00%	PASS	

Insulation Resistance

Breaker Voltage Rating	600	VAC Phase to Phase
Minimum Test Voltage	1000	kVDC
Test Voltage Used	1000	kVDC
Test Duration per Reading	60	Seconds

Insulation Temperature	25	°C	
Temperature Correction Factor	1.25		
Minimum Insulation Resistance	100	MΩ	

State	Points	Measurements MΩ	Corrected for °C MΩ	Pass or Fail
Closed	A to B	170	212.5	PASS
Closed	B to C	125	156.25	PASS
Closed	C to A	150	187.5	PASS
Closed	A to G	105	131.25	PASS
Closed	B to G	66	82.5	PASS
Closed	C to G	100	125	PASS
Open	A Line - Load	184	230	PASS
Open	B Line - Load	2200	2750	PASS
Open	C Line - Load	120	150	PASS
Any	Control Wiring	2200	2750	PASS

OVERALL PASS/FAIL: PASS

Comments

Deficiencies

ELECTRO TEST
OAHU, HAWAII

NETA ACCREDITED COMPANY

Insulated Case Circuit Breaker Test and Inspection
ATS 1 Emergency

Customer **American Electric**	Site **Lihue International Airport**	Agreement Number **ET22-121**
Date **3/22/2022** / Technician **Jared Helminen**	Location **Lihue, HI**	Equipment Tag ID **ATS 1 Emergency**
Manufacturer **General Electric**	Model **Power Break**	SERIAL NUMBER **V78657**
Test Equipment Used (Calibration Numbers) **MEGGER DDA 1600 (Fluke 1587,AEMC 6240)**	Test Equipment Last Calibration Date **8/20/2020**	Substation **Primary**

Nameplate

Ambient Temperature	25 °C	Trip Unit Type	MVT			CAT number	THCVF5612
Humidity	60 %	Trip Unit Catalog Number	TP4VT206			Cubicle Code	N/A
Breaker Type	GE Power Breaker	Frame Size	1200	Amps		Sensor Taps	1200
Fuse Catalog Number	N/A					Cond Size and Type	N/A
Counter as Found	N/A	Mounting	Thermal Memory				
Counter As Left	N/A	Draw-Out	ON		ZONE INTERLOCK	OFF	
					GF	ON	

Inspection

Proper Mounting	Inspected	Pass	No Action Needed	Insulating Members	Inspected	Pass	No Action Needed
Conductors Match Single Line	YES	Pass	No Action Needed	Structural Members	Inspected	Pass	No Action Needed
Feeder Designation Match Drawing	Inspected	Pass	No Action Needed	Contact Fingers	Inspected	Pass	No Action Needed
Casing Intact with no Cracking	Inspected	Pass	No Action Needed	Arcing Contacts	Inspected	Pass	No Action Needed
Bolt Torque Levels Checked	NA/DLRO	Pass	No Action Needed	Arc Chutes	Inspected	Pass	No Action Needed
Breaker Operates Correctly	Inspected	Pass	No Action Needed	Auxiliary Devices	Inspected	Pass	No Action Needed
Frame Size & Trip Unit Correct	Inspected	Pass	No Action Needed				
Terminals Suitable for 75deg C	Inspected	Pass	No Action Needed	Overcurrent Device Battery	No battery	NA	NA

Overall Visual Inspection PASSED INSPECTION

Settings as Found

			Function			Pickup				Delay
	Rating Plug	1200	Long	1	X	1200 A	=	1200	A	1
GroundFault	Sensor Tap	1200	Short		X	A	=	0	A	
3W			Instantaneous	10	X	1200 A	=	12000	A	
			Ground Fault	0.2	X	1200 A	=	240	A	Max

Settings as Left

			Function			Pickup				Delay
	Rating Plug	1200	Long	1	X	1200 A	=	1200	A	1
GroundFault	Sensor Tap	1200	Short	0	X	0 A	=	0	A	0
3W			Instantaneous	10	X	1200 A	=	12000	A	
			Ground Fault	0.2	X	1200 A	=	240	A	Max

Timing Tests

Trip Curve (TCC) Number: GES-9910

Function	Test Amps	Current Multiple	Time Band Minimum	Time Band Maximum	As Found seconds	As Left seconds
Long Time	3600	3XIr	77	131	80.7	80.7
	LTPU (amps)				1308	1308
Short Time						
	STPU (amps)					
Instantaneous	12000	8XIn	0.01	0.07	0.05	0.05
	IPU (amps)				11500	11500
Ground Fault	360	1XIn	0.7	1.2	0.85	0.85
	GFPU (amps)				244	244

Contact Resistance Across Closed Poles

Breaker Current Rating	1200	Amps
Maximum Percent Load	100%	%
Maximum Load	1200	

	Measurements µΩ	Deviation	Deviation Pass or Fail	Overall Pass or Fail
Phase A	27	0.00%	PASS	PASS
Phase B	27	0.00%	PASS	
Phase C	28	3.70%	PASS	

Insulation Resistance

Breaker Voltage Rating	600	VAC Phase to Phase
Minimum Test Voltage	1000	kVDC
Test Voltage Used	1000	kVDC
Test Duration per Reading	60	Seconds

		Measurements	Corrected for °C	
State	Points	MΩ	MΩ	Pass or Fail
Closed	A to B	99	123.75	PASS
Closed	B to C	5.9	7.375	PASS
Closed	C to A	93	116.25	PASS
Closed	A to G	76	95	PASS
Closed	B to G	45	56.25	PASS
Closed	C to G	40	50	PASS
Open	A Line - Load	800	1000	PASS
Open	B Line - Load	92	115	PASS
Open	C Line - Load	90	112.5	PASS
Any	Control Wiring	2200	2750	PASS

Insulation Temperature	25	°C
Temperature Correction Factor	1.25	
Minimum Insulation Resistance	100	MΩ

OVERALL PASS/FAIL: PASS

Comments

Deficiencies

ELECTRO TEST
OAHU, HAWAII

NETA ACCREDITED COMPANY

Insulated Case Circuit Breaker Test and Inspection
ATS 2 Emergency

Customer **American Electric**	Site **Lihue International Airport**	Agreement Number **ET22-121**
Date **3/22/2022** / Technician **Jared Helminen**	Location **Lihue, HI**	Equipment Tag ID **ATS 2 Emergency**
Manufacturer **General Electric**	Model **Power Break**	SERIAL NUMBER **V78656**
Test Equipment Used (Calibration Numbers) **MEGGER DDA 1600 (Fluke 1587,AEMC 6240)**	Test Equipment Last Calibration Date **8/20/2020**	Substation **Primary**

Nameplate

Ambient Temperature	25	°C	Trip Unit Type	MVT		CAT number	THCVF5612
Humidity	60	%	Trip Unit Catalog Number	TP4VT206		Cubicle Code	N/A
Breaker Type	GE Power Breaker		Frame Size	1200	Amps	Sensor Taps	1200
Fuse Catalog Number	N/A					Cond Size and Type	N/A
Counter as Found	N/A		Mounting	Thermal Memory			
Counter As Left	N/A		Draw-Out	ON			

ZONE INTERLOCK OFF
GF ON

Inspection

Proper Mounting	Inspected	Pass	No Action Needed	Insulating Members	Inspected	Pass	No Action Needed
Conductors Match Single Line	YES	Pass	No Action Needed	Structural Members	Inspected	Pass	No Action Needed
Feeder Designation Match Drawing	Inspected	Pass	No Action Needed	Contact Fingers	Inspected	Pass	No Action Needed
Casing Intact with no Cracking	Inspected	Pass	No Action Needed	Arcing Contacts	Inspected	Pass	No Action Needed
Bolt Torque Levels Checked	NA/DLRO	Pass	No Action Needed	Arc Chutes	Inspected	Pass	No Action Needed
Breaker Operates Correctly	Inspected	Pass	No Action Needed	Auxiliary Devices	Inspected	Pass	No Action Needed
Frame Size & Trip Unit Correct	Inspected	Pass	No Action Needed				
Terminals Suitable for 75deg C	Inspected	Pass	No Action Needed	Overcurrent Device Battery	No battery	NA	NA

Overall Visual Inspection PASSED INSPECTION

Settings as Found

			Function			Pickup				Delay
	Rating Plug	1200	Long	1	X	1200 A	=	1200	A	1
GroundFault	Sensor Tap	1200	Short		X	A	=	0	A	
3W			Instantaneous	10	X	1200 A	=	12000	A	
			Ground Fault	0.2	X	1200 A	=	240	A	Max

Settings as Left

			Function			Pickup				Delay
	Rating Plug	1200	Long	1	X	1200 A	=	1200	A	1
GroundFault	Sensor Tap	1200	Short	0	X	1200 A	=	0	A	0
3W			Instantaneous	10	X	1200 A	=	12000	A	
			Ground Fault	0.2	X	1200 A	=	240	A	Max

Timing Tests

Trip Curve (TCC) Number: GES-9910

Function	Test Amps	Current Multiple	Time Band Minimum	Time Band Maximum	As Found seconds	As Left seconds
Long Time	3600	3XIr	77	131	83.1	83.1
	LTPU (amps)				1404	1404
Short Time						0
	STPU (amps)					0
Instantaneous	12000	8XIn	0.01	0.07	0.05	0.05
	IPU (amps)				12600	12600
Ground Fault	360	1XIn	0.7	1.2	0.80	0.80
	GFPU (amps)				240	240

Contact Resistance Across Closed Poles

Breaker Current Rating	1200	Amps
Maximum Percent Load	100%	%
Maximum Load	1200	

	Measurements µΩ	Deviation	Deviation Pass or Fail	Overall Pass or Fail
Phase A	29	11.54%	PASS	PASS
Phase B	26	0.00%	PASS	
Phase C	38	46.15%	PASS	

Insulation Resistance

Breaker Voltage Rating	600	VAC Phase to Phase
Minimum Test Voltage	1000	kVDC
Test Voltage Used	1000	kVDC
Test Duration per Reading	60	Seconds

		Measurements	Corrected for °C	
State	Points	MΩ	MΩ	Pass or Fail
Closed	A to B	62	77.5	PASS
Closed	B to C	12.5	15.625	PASS
Closed	C to A	50	62.5	PASS
Closed	A to G	50	62.5	PASS
Closed	B to G	15	18.75	PASS
Closed	C to G	11	13.75	PASS
Open	A Line - Load	96	120	PASS
Open	B Line - Load	71	88.75	PASS
Open	C Line - Load	70	87.5	PASS
Any	Control Wiring	2200	2750	PASS

Insulation Temperature	25	°C
Temperature Correction Factor	1.25	
Minimum Insulation Resistance	100	MΩ

OVERALL PASS/FAIL: PASS

Comments

Deficiencies

ELECTRO TEST
OAHU, HAWAII

NETA ACCREDITED COMPANY

Insulated Case Circuit Breaker Test and Inspection
Capacitor

Customer **American Electric**	Site **Lihue International Airport**	Agreement Number **ET22-121**
Date **3/21/2022** / Technician **Jared Helminen**	Location **Lihue, HI**	Equipment Tag ID **Capacitor**
Manufacturer **General Electric**	Model **Power Break**	SERIAL NUMBER **V110841**
Test Equipment Used (Calibration Numbers) **MEGGER DDA 1600 (Fluke 1587,AEMC 6240)**	Test Equipment Last Calibration Date **8/20/2020**	Substation **Primary**

Nameplate

Ambient Temperature	25	°C	Trip Unit Type	MVT RMS-9		CAT number	TP1616SS
Humidity	60	%	Trip Unit Catalog Number	TR16S1200		Cubicle Code	N/A
Breaker Type	GE Power Breaker		Frame Size	1600	Amps	Sensor Taps	1600
Fuse Catalog Number	N/A					Cond Size and Type	N/A
Counter as Found	N/A		Mounting	Thermal Memory			
Counter As Left	N/A		Draw-Out	ON			

ZONE INTERLOCK OFF
GF ALARM ONLY ON

Inspection

Proper Mounting	Inspected	Pass	No Action Needed	Insulating Members	Inspected	Pass	No Action Needed
Conductors Match Single Line	YES	Pass	No Action Needed	Structural Members	Inspected	Pass	No Action Needed
Feeder Designation Match Drawing	Inspected	Pass	No Action Needed	Contact Fingers	Inspected	Pass	No Action Needed
Casing Intact with no Cracking	Inspected	Pass	No Action Needed	Arcing Contacts	Inspected	Pass	No Action Needed
Bolt Torque Levels Checked	NA/DLRO	Pass	No Action Needed	Arc Chutes	Inspected	Pass	No Action Needed
Breaker Operates Correctly	Inspected	Pass	No Action Needed	Auxiliary Devices	Inspected	Pass	No Action Needed
Frame Size & Trip Unit Correct	Inspected	Pass	No Action Needed				
Terminals Suitable for 75deg C	Inspected	Pass	No Action Needed	Overcurrent Device Battery	No battery	NA	NA

Overall Visual Inspection PASSED INSPECTION

Settings as Found

			Function			Pickup					Delay
GroundFault 3W	Rating Plug	1200	Long	1	X	1200	A	=	1200	A	Max
	Sensor Tap	1600	Short	3	X	1200	A	=	3600	A	Min (Out)
			Instantaneous	3	X	1200	A	=	3600	A	
			Ground Fault	0.2	X	1200	A	=	240	A	Min (Out)

Settings as Left

			Function			Pickup					Delay
GroundFault 3W	Rating Plug	1200	Long	1	X	1200	A	=	1200	A	Max
	Sensor Tap	1600	Short	3	X	1200	A	=	3600	A	Min (Out)
			Instantaneous	3	X	1200	A	=	3600	A	
			Ground Fault	0.2	X	1200	A	=	240	A	Min (Out)

Timing Tests

Trip Curve (TCC) Number: GES-9910

Function	Test Amps	Current Multiple	Time Band Minimum	Time Band Maximum	As Found seconds	As Left seconds
Long Time	3600	3XIr	80	120	94.99	94.99
Short Time	4800	6XIr	0.08	0.17	0.12	0.12
Instantaneous	4800	8XIn	0.01	0.07	0.05	0.05
Ground Fault	360	0.3XIn	0.08	0.17	0.12	0.12

Contact Resistance Across Closed Poles

Breaker Current Rating	1200	Amps
Maximum Percent Load	100%	%
Maximum Load	1200	

	Measurements µΩ	Deviation	Deviation Pass or Fail	Overall Pass or Fail
Phase A	32	0.00%	PASS	PASS
Phase B	34	6.25%	PASS	
Phase C	36	12.50%	PASS	

Insulation Resistance

Breaker Voltage Rating	600	VAC Phase to Phase
Minimum Test Voltage	1000	kVDC
Test Voltage Used	1000	kVDC
Test Duration per Reading	60	Seconds

Insulation Temperature	25	°C
Temperature Correction Factor	1.25	
Minimum Insulation Resistance	100	MΩ

State	Points	Measurements MΩ	Corrected for °C MΩ	Pass or Fail
Closed	A to B	2200	2750	PASS
Closed	B to C	2200	2750	PASS
Closed	C to A	2200	2750	PASS
Closed	A to G	1700	2125	PASS
Closed	B to G	1700	2125	PASS
Closed	C to G	2100	2625	PASS
Open	A Line - Load	2200	2750	PASS
Open	B Line - Load	2200	2750	PASS
Open	C Line - Load	2200	2750	PASS
Any	Control Wiring	2200	2750	PASS

OVERALL PASS/FAIL: PASS

Comments

Deficiencies

ELECTRO TEST
OAHU, HAWAII

NETA ACCREDITED COMPANY

Insulated Case Circuit Breaker Test and Inspection
Main Breaker #1

Customer **American Electric**	Site **Lihue International Airport**	Agreement Number **ET22-121**
Date **3/23/2022** / Technician **Jared Helminen**	Location **Lihue, HI**	Equipment Tag ID **Main Breaker #1**
Manufacturer **General Electric**	Model **Power Break**	SERIAL NUMBER **78395**
Test Equipment Used (Calibration Numbers) **MEGGER DDA 1600 (Fluke 1587,AEMC 6240)**	Test Equipment Last Calibration Date **8/20/2020**	Substation **Primary**

Nameplate

Ambient Temperature	25	°C	Trip Unit Type	MVT RMS-9		CAT number	THCBV9640K
Humidity	60	%	Trip Unit Catalog Number	TR40S4000		Cubicle Code	N/A
Breaker Type	GE Power Breaker		Frame Size	4000	Amps	Sensor Taps	4000
Fuse Catalog Number	N/A					Cond Size and Type	N/A
Counter as Found	N/A		Mounting	Thermal Memory			
Counter As Left	N/A		Draw-Out	OFF			

ZONE INTERLOCK OFF
GF ALARM ONLY ON

Inspection

Proper Mounting	Inspected	Pass	No Action Needed	Insulating Members	Inspected	Pass	No Action Needed
Conductors Match Single Line	YES	Pass	No Action Needed	Structural Members	Inspected	Pass	No Action Needed
Feeder Designation Match Drawing	Inspected	Pass	No Action Needed	Contact Fingers	Inspected	Pass	No Action Needed
Casing Intact with no Cracking	Inspected	Pass	No Action Needed	Arcing Contacts	Inspected	Pass	No Action Needed
Bolt Torque Levels Checked	NA/DLRO	Pass	No Action Needed	Arc Chutes	Inspected	Pass	No Action Needed
Breaker Operates Correctly	Inspected	Pass	No Action Needed	Auxiliary Devices	Inspected	Pass	No Action Needed
Frame Size & Trip Unit Correct	Inspected	Pass	No Action Needed				
Terminals Suitable for 75deg C	Inspected	Pass	No Action Needed	Overcurrent Device Battery	No battery	NA	NA

Overall Visual Inspection PASSED INSPECTION

Settings as Found

			Function			Pickup				Delay
GroundFault 3W	Rating Plug	4000	Long	0.6	X	4000 A	=	2400	A	3
	Sensor Tap	4000	Short	4	X	2400 A	=	9600	A	Int (Out)
			Instantaneous	2	X	4000 A	=	8000	A	
			Ground Fault	0.3	X	4000 A	=	1200	A	Int (In)

Settings as Left

			Function			Pickup				Delay
GroundFault 3W	Rating Plug	4000	Long	0.6	X	4000 A	=	2400	A	3
	Sensor Tap	4000	Short	4	X	2400 A	=	9600	A	Int (Out)
			Instantaneous	2	X	4000 A	=	8000	A	
			Ground Fault	0.3	X	4000 A	=	1200	A	Int (In)

Timing Tests

Trip Curve (TCC) Number: GES-9910

Function	Test Amps	Current Multiple	Time Band Minimum	Time Band Maximum	As Found seconds	As Left seconds
Long Time	7200	3XIr	40	60	45.62	45.62
	LTPU (amps)					
Short Time	9600		0.22	0.32	0.25	0.25
	STPU (amps)					
Instantaneous	12000	8XIn	0.01	0.07	0.05	0.05
	IPU (amps)					
Ground Fault	1800	.45XIn	0.7	1.2	0.82	0.82
	GFPU (amps)					

Contact Resistance Across Closed Poles

Breaker Current Rating	4000	Amps
Maximum Percent Load	100%	%
Maximum Load	4000	

	Measurements µΩ	Deviation	Deviation Pass or Fail	Overall Pass or Fail
Phase A	16	6.67%	PASS	PASS
Phase B	15	0.00%	PASS	
Phase C	18	20.00%	PASS	

Insulation Resistance

Breaker Voltage Rating	600	VAC Phase to Phase
Minimum Test Voltage	1000	kVDC
Test Voltage Used	1000	kVDC
Test Duration per Reading	60	Seconds

Insulation Temperature	25	°C		
Temperature Correction Factor	1.25			
Minimum Insulation Resistance	100	MΩ		

State	Points	Measurements MΩ	Corrected for °C MΩ	Pass or Fail
Closed	A to B	124	155	PASS
Closed	B to C	18	22.5	PASS
Closed	C to A	168	210	PASS
Closed	A to G	104	130	PASS
Closed	B to G	240	300	PASS
Closed	C to G	300	375	PASS
Open	A Line - Load	2200	2750	PASS
Open	B Line - Load	2200	2750	PASS
Open	C Line - Load	2200	2750	PASS
Any	Control Wiring	2200	2750	PASS

OVERALL PASS/FAIL: PASS

Comments

Deficiencies

ELECTRO TEST
OAHU, HAWAII

NETA ACCREDITED COMPANY

Insulated Case Circuit Breaker Test and Inspection
Tie Breaker

Customer **American Electric**	Site **Lihue International Airport**	Agreement Number **ET22-121**
Date **3/23/2022** / Technician **Jared Helminen**	Location **Lihue, HI**	Equipment Tag ID **Tie Breaker**
Manufacturer **General Electric**	Model **Power Break**	SERIAL NUMBER **V76641**
Test Equipment Used (Calibration Numbers) **MEGGER DDA 1600 (Fluke 1587,AEMC 6240)**	Test Equipment Last Calibration Date **8/20/2020**	Substation **Primary**

Nameplate

Ambient Temperature	25	°C	Trip Unit Type	MVT		CAT number	TCVVF9640R
Humidity	60	%	Trip Unit Catalog Number	TP9TV40SLGA3		Cubicle Code	N/A
Breaker Type	GE Power Breaker		Frame Size	4000	Amps	Sensor Taps	4000
Fuse Catalog Number	N/A					Cond Size and Type	N/A
Counter as Found	N/A		Mounting	Thermal Memory			
Counter As Left	N/A		Draw-Out	OFF			

ZONE INTERLOCK OFF
GF ALARM ONLY ON

Inspection

Proper Mounting	Inspected	Pass	No Action Needed	Insulating Members	Inspected	Pass	No Action Needed
Conductors Match Single Line	YES	Pass	No Action Needed	Structural Members	Inspected	Pass	No Action Needed
Feeder Designation Match Drawing	Inspected	Pass	No Action Needed	Contact Fingers	Inspected	Pass	No Action Needed
Casing Intact with no Cracking	Inspected	Pass	No Action Needed	Arcing Contacts	Inspected	Pass	No Action Needed
Bolt Torque Levels Checked	NA/DLRO	Pass	No Action Needed	Arc Chutes	Inspected	Pass	No Action Needed
Breaker Operates Correctly	Inspected	Pass	No Action Needed	Auxiliary Devices	Inspected	Pass	No Action Needed
Frame Size & Trip Unit Correct	Inspected	Pass	No Action Needed				
Terminals Suitable for 75deg C	Inspected	Pass	No Action Needed	Overcurrent Device Battery	No battery	NA	NA

Overall Visual Inspection PASSED INSPECTION

Settings as Found

			Function			Pickup				Delay
GroundFault 3W	Rating Plug	4000	Long	0.6	X	4000 A	=	2400	A	3
	Sensor Tap	4000	Short	4	X	4000 A	=	16000	A	Int
			Instantaneous	2	X	4000 A	=	8000	A	
			Ground Fault	0.3	X	4000 A	=	1200	A	Int

Settings as Left

			Function			Pickup				Delay
GroundFault 3W	Rating Plug	4000	Long	0.6	X	4000 A	=	2400	A	3
	Sensor Tap	4000	Short	4	X	4000 A	=	16000	A	Int
			Instantaneous	2	X	4000 A	=	8000	A	
			Ground Fault	0.3	X	4000 A	=	1200	A	Int

Timing Tests

Trip Curve (TCC) Number: GES-9910

Function	Test Amps	Current Multiple	Time Band Minimum	Time Band Maximum	As Found seconds	As Left seconds
Long Time	7200	3XIr	40	60	40.5	40.5
	LTPU (amps)				2440	2440
Short Time	10800		0.22	0.32	0.30	0.30
	STPU (amps)				9450	9450
Instantaneous	12000	8XIn	0.01	0.07	0.05	0.05
	IPU (amps)				12100	12100
Ground Fault	1800	1XIn	0.77	1.31	0.85	0.85
	GFPU (amps)				1184	1184

Contact Resistance Across Closed Poles

Breaker Current Rating	4000	Amps
Maximum Percent Load	100%	%
Maximum Load	4000	

	Measurements µΩ	Deviation	Deviation Pass or Fail	Overall Pass or Fail
Phase A	21	16.67%	PASS	PASS
Phase B	18	0.00%	PASS	
Phase C	22	22.22%	PASS	

Insulation Resistance

Breaker Voltage Rating	600	VAC Phase to Phase
Minimum Test Voltage	1000	kVDC
Test Voltage Used	1000	kVDC
Test Duration per Reading	60	Seconds

Insulation Temperature	25	°C
Temperature Correction Factor	1.25	
Minimum Insulation Resistance	100	MΩ

State	Points	Measurements MΩ	Corrected for °C MΩ	Pass or Fail
Closed	A to B	20	25	PASS
Closed	B to C	22	27.5	PASS
Closed	C to A	27	33.75	PASS
Closed	A to G	18	22.5	PASS
Closed	B to G	17	21.25	PASS
Closed	C to G	18	22.5	PASS
Open	A Line - Load	80	100	PASS
Open	B Line - Load	60	75	PASS
Open	C Line - Load	130	162.5	PASS
Any	Control Wiring	1700	2125	PASS

OVERALL PASS/FAIL: PASS

Comments

Deficiencies

ELECTRO TEST
OAHU, HAWAII

NETA ACCREDITED COMPANY

Insulated Case Circuit Breaker Test and Inspection
Main Breaker #2

Customer **American Electric**	Site **Lihue International Airport**	Agreement Number **ET22-121**
Date **3/23/2022** / Technician **Jared Helminen**	Location **Lihue, HI**	Equipment Tag ID **Main Breaker #2**
Manufacturer **General Electric**	Model **Power Break**	SERIAL NUMBER **V76643**
Test Equipment Used (Calibration Numbers) **MEGGER DDA 1600 (Fluke 1587,AEMC 6240)**	Test Equipment Last Calibration Date **8/20/2020**	Substation **Primary**

Nameplate

Ambient Temperature	25	°C	Trip Unit Type	MVT		CAT number	TCVVF9640R
Humidity	60	%	Trip Unit Catalog Number	TP9TV40SLGA3		Cubicle Code	N/A
Breaker Type	GE Power Breaker		Frame Size	4000	Amps	Sensor Taps	4000
Fuse Catalog Number	N/A					Cond Size and Type	N/A
Counter as Found	N/A		Mounting	Thermal Memory			
Counter As Left	N/A		Draw-Out	OFF			

ZONE INTERLOCK OFF
GF ALARM ONLY ON

Inspection

Proper Mounting	Inspected	Pass	No Action Needed	Insulating Members	Inspected	Pass	No Action Needed
Conductors Match Single Line	YES	Pass	No Action Needed	Structural Members	Inspected	Pass	No Action Needed
Feeder Designation Match Drawing	Inspected	Pass	No Action Needed	Contact Fingers	Inspected	Pass	No Action Needed
Casing Intact with no Cracking	Inspected	Pass	No Action Needed	Arcing Contacts	Inspected	Pass	No Action Needed
Bolt Torque Levels Checked	NA/DLRO	Pass	No Action Needed	Arc Chutes	Inspected	Pass	No Action Needed
Breaker Operates Correctly	Inspected	Pass	No Action Needed	Auxiliary Devices	Inspected	Pass	No Action Needed
Frame Size & Trip Unit Correct	Inspected	Pass	No Action Needed				
Terminals Suitable for 75deg C	Inspected	Pass	No Action Needed	Overcurrent Device Battery	No battery	NA	NA

Overall Visual Inspection PASSED INSPECTION

Settings as Found

			Function			Pickup				Delay
GroundFault 3W	Rating Plug	4000	Long	0.6	X	4000 A	=	2400	A	3
	Sensor Tap	4000	Short	4	X	4000 A	=	16000	A	Int
			Instantaneous	2	X	4000 A	=	8000	A	
			Ground Fault	0.3	X	4000 A	=	1200	A	Int

Settings as Left

			Function			Pickup				Delay
GroundFault 3W	Rating Plug	4000	Long	0.6	X	4000 A	=	2400	A	3
	Sensor Tap	4000	Short	4	X	4000 A	=	16000	A	Int
			Instantaneous	2	X	4000 A	=	8000	A	
			Ground Fault	0.3	X	4000 A	=	1200	A	Int

Timing Tests

Trip Curve (TCC) Number: GES-9910

Function	Test Amps	Current Multiple	Time Band Minimum	Time Band Maximum	As Found seconds	As Left seconds
Long Time	7200	3XIr	40	60	40.8	40.8
	LTPU (amps)				2520	2520
Short Time	9600		0.22	0.32	0.3	0.3
	STPU (amps)				9400	9400
Instantaneous	12000	2XIn	0.01	0.07	0.05	0.05
	IPU (amps)				8000	8000
Ground Fault	1800	1XIn	0.7	1.2	0.85	0.85
	GFPU (amps)				1204	1204

Contact Resistance Across Closed Poles

Breaker Current Rating	4000	Amps
Maximum Percent Load	100%	%
Maximum Load	4000	

	Measurements µΩ	Deviation	Deviation Pass or Fail	Overall Pass or Fail
Phase A	22	29.41%	PASS	PASS
Phase B	17	0.00%	PASS	
Phase C	27	58.82%	PASS	

Insulation Resistance

Breaker Voltage Rating	600	VAC Phase to Phase
Minimum Test Voltage	1000	kVDC
Test Voltage Used	1000	kVDC
Test Duration per Reading	60	Seconds

Insulation Temperature	25	°C
Temperature Correction Factor	1.25	
Minimum Insulation Resistance	100	MΩ

State	Points	Measurements MΩ	Corrected for °C MΩ	Pass or Fail
Closed	A to B	15	18.75	PASS
Closed	B to C	10	12.5	PASS
Closed	C to A	14	17.5	PASS
Closed	A to G	11	13.75	PASS
Closed	B to G	9	11.25	PASS
Closed	C to G	8	10	PASS
Open	A Line - Load	150	187.5	PASS
Open	B Line - Load	130	162.5	PASS
Open	C Line - Load	160	200	PASS
Any	Control Wiring	2200	2750	PASS

OVERALL PASS/FAIL: PASS

Comments

Deficiencies

ELECTRO TEST
OAHU, HAWAII

NETA ACCREDITED COMPANY

Insulated Case Circuit Breaker Test and Inspection
ATS 1

Customer **American Electric**	Site **Lihue International Airport**	Agreement Number **ET22-121**
Date **3/24/2022** / Technician **Jared Helminen**	Location **Lihue, HI**	Equipment Tag ID **ATS 1**
Manufacturer **General Electric**	Model **Power Break**	SERIAL NUMBER **V77611**
Test Equipment Used (Calibration Numbers) **MEGGER DDA 1600 (Fluke 1587,AEMC 6240)**	Test Equipment Last Calibration Date **8/20/2020**	Substation **Primary**

Nameplate

Ambient Temperature	25 °C	Trip Unit Type	MVT			CAT number	TPVVF5612RB
Humidity	60 %	Trip Unit Catalog Number	TP9TV20SLGB			Cubicle Code	N/A
Breaker Type	GE Power Breaker	Frame Size	1200	Amps		Sensor Taps	1200
Fuse Catalog Number	N/A					Cond Size and Type	N/A
Counter as Found	N/A	Mounting	Thermal Memory				
Counter As Left	N/A	Draw-Out	OFF				

ZONE INTERLOCK OFF
GF ALARM ONLY ON

Inspection

Proper Mounting	Inspected	Pass	No Action Needed	Insulating Members	Inspected	Pass	No Action Needed
Conductors Match Single Line	YES	Pass	No Action Needed	Structural Members	Inspected	Pass	No Action Needed
Feeder Designation Match Drawing	Inspected	Pass	No Action Needed	Contact Fingers	Inspected	Pass	No Action Needed
Casing Intact with no Cracking	Inspected	Pass	No Action Needed	Arcing Contacts	Inspected	Pass	No Action Needed
Bolt Torque Levels Checked	NA/DLRO	Pass	No Action Needed	Arc Chutes	Inspected	Pass	No Action Needed
Breaker Operates Correctly	Inspected	Pass	No Action Needed	Auxiliary Devices	Inspected	Pass	No Action Needed
Frame Size & Trip Unit Correct	Inspected	Pass	No Action Needed				
Terminals Suitable for 75deg C	Inspected	Pass	No Action Needed	Overcurrent Device Battery	No battery	NA	NA

Overall Visual Inspection PASSED INSPECTION

Settings as Found

			Function		Pickup					Delay
GroundFault 3W	Rating Plug	1200	Long	1	X 1200	A	=	1200	A	4
	Sensor Tap	1200	Short	4	X 1200	A	=	4800	A	Int
			Instantaneous	10	X 1200	A	=	12000	A	
			Ground Fault	0.25	X 1200	A	=	300	A	Min

Settings as Left

			Function		Pickup					Delay
GroundFault 3W	Rating Plug	1200	Long	1	X 1200	A	=	1200	A	4
	Sensor Tap	1200	Short	4	X 1200	A	=	4800	A	Int
			Instantaneous	10	X 1200	A	=	12000	A	
			Ground Fault	0.25	X 1200	A	=	300	A	Min

Timing Tests

Trip Curve (TCC) Number: GES-9910

Function	Test Amps	Current Multiple	Time Band Minimum	Time Band Maximum	As Found seconds	As Left seconds
Long Time	3600	3XIr	40	60	50.5	50.5
	LTPU (amps)				1200	1200
Short Time	4800		0.22	0.32	0.30	0.30
	STPU (amps)				4850	4850
Instantaneous	12000	8XIn	0.01	0.07	0.05	0.05
	IPU (amps)				12000	12000
Ground Fault	450	1XIn	0.7	1.2	0.85	0.85
	GFPU (amps)				305	305

Contact Resistance Across Closed Poles

Breaker Current Rating	1200	Amps
Maximum Percent Load	100%	%
Maximum Load	1200	

	Measurements µΩ	Deviation	Deviation Pass or Fail	Overall Pass or Fail
Phase A	35	16.67%	PASS	PASS
Phase B	30	0.00%	PASS	
Phase C	40	33.33%	PASS	

Insulation Resistance

Breaker Voltage Rating	600	VAC Phase to Phase
Minimum Test Voltage	1000	kVDC
Test Voltage Used	1000	kVDC
Test Duration per Reading	60	Seconds

Insulation Temperature	25	°C
Temperature Correction Factor	1.25	
Minimum Insulation Resistance	100	MΩ

State	Points	Measurements MΩ	Corrected for °C MΩ	Pass or Fail
Closed	A to B	16	20	PASS
Closed	B to C	14	17.5	PASS
Closed	C to A	19	23.75	PASS
Closed	A to G	17	21.25	PASS
Closed	B to G	14	17.5	PASS
Closed	C to G	15	18.75	PASS
Open	A Line - Load	90	112.5	PASS
Open	B Line - Load	75	93.75	PASS
Open	C Line - Load	68	85	PASS
Any	Control Wiring	2200	2750	PASS

OVERALL PASS/FAIL: PASS

Comments

Deficiencies

ELECTRO TEST
OAHU, HAWAII

NETA ACCREDITED COMPANY

Insulated Case Circuit Breaker Test and Inspection
ATS 2

Customer **American Electric**	Site **Lihue International Airport**	Agreement Number **ET22-121**
Date **3/23/2022** / Technician **Jared Helminen**	Location **Lihue, HI**	Equipment Tag ID **ATS 2**
Manufacturer **General Electric**	Model **Power Break**	SERIAL NUMBER **V77612**
Test Equipment Used (Calibration Numbers) **MEGGER DDA 1600 (Fluke 1587,AEMC 6240)**	Test Equipment Last Calibration Date **8/20/2020**	Substation **Primary**

Nameplate

Ambient Temperature	25	°C	Trip Unit Type	MVT		CAT number	TPVVF5612RB
Humidity	60	%	Trip Unit Catalog Number	TP9TV20SLGB		Cubicle Code	N/A
Breaker Type	GE Power Breaker		Frame Size	1200	Amps	Sensor Taps	1200
Fuse Catalog Number	N/A					Cond Size and Type	N/A
Counter as Found	N/A		Mounting	Thermal Memory			
Counter As Left	N/A		Draw-Out	ON			

ZONE INTERLOCK
GF ALARM ONLY

Inspection

Proper Mounting	Inspected	Pass	No Action Needed	Insulating Members	Inspected	Pass	No Action Needed
Conductors Match Single Line	YES	Pass	No Action Needed	Structural Members	Inspected	Pass	No Action Needed
Feeder Designation Match Drawing	Inspected	Pass	No Action Needed	Contact Fingers	Inspected	Pass	No Action Needed
Casing Intact with no Cracking	Inspected	Pass	No Action Needed	Arcing Contacts	Inspected	Pass	No Action Needed
Bolt Torque Levels Checked	NA/DLRO	Pass	No Action Needed	Arc Chutes	Inspected	Pass	No Action Needed
Breaker Operates Correctly	Inspected	Pass	No Action Needed	Auxiliary Devices	Inspected	Pass	No Action Needed
Frame Size & Trip Unit Correct	Inspected	Pass	No Action Needed				
Terminals Suitable for 75deg C	Inspected	Pass	No Action Needed	Overcurrent Device Battery	No battery	NA	NA

Overall Visual Inspection PASSED INSPECTION

Settings as Found

			Function			Pickup				Delay
GroundFault 3W	Rating Plug	1200	Long	1	X	1200 A	=	1200	A	4
	Sensor Tap	1200	Short	5	X	1200 A	=	6000	A	Max
			Instantaneous	10	X	1200 A	=	12000	A	
			Ground Fault	0.25	X	1200 A	=	300	A	Max

Settings as Left

			Function			Pickup				Delay
GroundFault 3W	Rating Plug	1200	Long	1	X	1200 A	=	1200	A	4
	Sensor Tap	1200	Short	5	X	1200 A	=	6000	A	Max
			Instantaneous	10	X	1200 A	=	12000	A	
			Ground Fault	0.25	X	1200 A	=	300	A	Max

Timing Tests

Trip Curve (TCC) Number: GES-9910

Function	Test Amps	Current Multiple	Time Band Minimum	Time Band Maximum	As Found seconds	As Left seconds
Long Time	3600	3XIr	80	125	108.4	108.4
	LTPU (amps)				1320	1320
Short Time	6000		0.38	0.5	0.40	0.40
	STPU (amps)				6000	6000
Instantaneous	12000	8XIn	0.01	0.07	0.05	0.05
	IPU (amps)				12000	12000
Ground Fault	450	1XIn	0.7	1.2	0.83	0.83
	GFPU (amps)				305	305

Contact Resistance Across Closed Poles

Breaker Current Rating	1200	Amps
Maximum Percent Load	100%	%
Maximum Load	1200	

	Measurements µΩ	Deviation	Deviation Pass or Fail	Overall Pass or Fail
Phase A	33	13.79%	PASS	PASS
Phase B	29	0.00%	PASS	
Phase C	40	37.93%	PASS	

Insulation Resistance

Breaker Voltage Rating	600	VAC Phase to Phase
Minimum Test Voltage	1000	kVDC
Test Voltage Used	1000	kVDC
Test Duration per Reading	60	Seconds

Insulation Temperature	25	°C
Temperature Correction Factor	1.25	
Minimum Insulation Resistance	100	MΩ

State	Points	Measurements MΩ	Corrected for °C MΩ	Pass or Fail
Closed	A to B	285	356.25	PASS
Closed	B to C	260	325	PASS
Closed	C to A	300	375	PASS
Closed	A to G	160	200	PASS
Closed	B to G	150	187.5	PASS
Closed	C to G	140	175	PASS
Open	A Line - Load	650	812.5	PASS
Open	B Line - Load	620	775	PASS
Open	C Line - Load	610	762.5	PASS
Any	Control Wiring	2200	2750	PASS

OVERALL PASS/FAIL: PASS

Comments

Deficiencies

ELECTRO TEST
OAHU, HAWAII

NETA ACCREDITED COMPANY

Insulated Case Circuit Breaker Test and Inspection
ATS 4

Customer **American Electric**	Site **Lihue International Airport**	Agreement Number **ET22-121**
Date **3/24/2022** / Technician **Jared Helminen**	Location **Lihue, HI**	Equipment Tag ID **ATS 4**
Manufacturer **General Electric**	Model **Power Break**	SERIAL NUMBER **V76643**
Test Equipment Used (Calibration Numbers) **MEGGER DDA 1600 (Fluke 1587,AEMC 6240)**	Test Equipment Last Calibration Date **8/20/2020**	Substation **Primary**

Nameplate

Ambient Temperature	25	°C	Trip Unit Type	MVT		CAT number	TPVVF7625R
Humidity	60	%	Trip Unit Catalog Number	TP9VT30SLG		Cubicle Code	N/A
Breaker Type	GE Power Breaker		Frame Size	2500	Amps	Sensor Taps	2500
Fuse Catalog Number	N/A					Cond Size and Type	N/A
Counter as Found	N/A		Mounting	Thermal Memory			
Counter As Left	N/A		Draw-Out	OFF			

ZONE INTERLOCK OFF
GF ON

Inspection

Proper Mounting	Inspected	Pass	No Action Needed	Insulating Members	Inspected	Pass	No Action Needed
Conductors Match Single Line	YES	Pass	No Action Needed	Structural Members	Inspected	Pass	No Action Needed
Feeder Designation Match Drawing	Inspected	Pass	No Action Needed	Contact Fingers	Inspected	Pass	No Action Needed
Casing Intact with no Cracking	Inspected	Pass	No Action Needed	Arcing Contacts	Inspected	Pass	No Action Needed
Bolt Torque Levels Checked	NA/DLRO	Pass	No Action Needed	Arc Chutes	Inspected	Pass	No Action Needed
Breaker Operates Correctly	Inspected	Pass	No Action Needed	Auxiliary Devices	Inspected	Pass	No Action Needed
Frame Size & Trip Unit Correct	Inspected	Pass	No Action Needed				
Terminals Suitable for 75deg C	Inspected	Pass	No Action Needed	Overcurrent Device Battery	No battery	NA	NA

Overall Visual Inspection PASSED INSPECTION

Settings as Found

			Function			Pickup				Delay
GroundFault 3W	Rating Plug	2500	Long	1	X	2500 A	=	2500	A	3
	Sensor Tap	2500	Short	5	X	2500 A	=	12500	A	Int
			Instantaneous	10	X	2500 A	=	25000	A	
			Ground Fault	0.3	X	2500 A	=	750	A	Max

Settings as Left

			Function			Pickup				Delay
GroundFault 3W	Rating Plug	2500	Long	1	X	2500 A	=	2500	A	3
	Sensor Tap	2500	Short	5	X	2500 A	=	12500	A	Int
			Instantaneous	10	X	2500 A	=	25000	A	
			Ground Fault	0.3	X	2500 A	=	750	A	Max

Timing Tests

Trip Curve (TCC) Number: GES-9910

Function	Test Amps	Current Multiple	Time Band Minimum	Time Band Maximum	As Found seconds	As Left seconds
Long Time	7500	3XIr	40	60	49.8	49.8
	LTPU (amps)				2550	2550
Short Time	18750	7.5XIr	0.22	0.32	0.29	0.29
	STPU (amps)				12650	12650
Instantaneous	25000	8XIn	0.01	0.07	0.05	0.05
	IPU (amps)				25100	25100
Ground Fault	1800	0.45XIn	0.7	1.2	0.83	0.83
	GFPU (amps)				770	770

Contact Resistance Across Closed Poles

Breaker Current Rating	2500	Amps
Maximum Percent Load	100%	%
Maximum Load	2500	

	Measurements µΩ	Deviation	Deviation Pass or Fail	Overall Pass or Fail
Phase A	22	0.00%	PASS	PASS
Phase B	22	0.00%	PASS	
Phase C	22	0.00%	PASS	

Insulation Resistance

Breaker Voltage Rating	600	VAC Phase to Phase
Minimum Test Voltage	1000	kVDC
Test Voltage Used	1000	kVDC
Test Duration per Reading	60	Seconds

Insulation Temperature	25	°C		
Temperature Correction Factor	1.25			
Minimum Insulation Resistance	100	MΩ		

State	Points	Measurements MΩ	Corrected for °C MΩ	Pass or Fail
Closed	A to B	1200	1500	PASS
Closed	B to C	2200	2750	PASS
Closed	C to A	2200	2750	PASS
Closed	A to G	210	262.5	PASS
Closed	B to G	140	175	PASS
Closed	C to G	1200	1500	PASS
Open	A Line - Load	2200	2750	PASS
Open	B Line - Load	2200	2750	PASS
Open	C Line - Load	2200	2750	PASS
Any	Control Wiring	2200	2750	PASS

OVERALL PASS/FAIL: PASS

Comments

Deficiencies

ELECTRO TEST
OAHU, HAWAII

NETA ACCREDITED COMPANY

Insulated Case Circuit Breaker Test and Inspection
SBA

Customer **American Electric**	Site **Lihue International Airport**	Agreement Number **ET21-121**
Date **3/24/2022** / Technician **Jared Helminen**	Location **Lihue, HI**	Equipment Tag ID **SBA**
Manufacturer **General Electric**	Model **Power Break**	SERIAL NUMBER **50150**
Test Equipment Used (Calibration Numbers) **MEGGER DDA 1600 (Fluke 1587,AEMC 6240)**	Test Equipment Last Calibration Date **8/20/2020**	Substation **Primary**

Nameplate

Ambient Temperature	25	°C	Trip Unit Type	MVT+		CAT number	PP1616TT
Humidity	60	%	Trip Unit Catalog Number	C216LSIG		Cubicle Code	N/A
Breaker Type	GE Power Breaker		Frame Size	1600	Amps	Sensor Taps	1600
Fuse Catalog Number	N/A						
Counter as Found	N/A		Mounting	Thermal Memory			
Counter As Left	N/A		Draw-Out	ON		ZONE INTERLOCK	OFF
						GF	ON

Inspection

Proper Mounting	Inspected	Pass	No Action Needed	Insulating Members	Inspected	Pass	No Action Needed
Conductors Match Single Line	YES	Pass	No Action Needed	Structural Members	Inspected	Pass	No Action Needed
Feeder Designation Match Drawing	Inspected	Pass	No Action Needed	Contact Fingers	Inspected	Pass	No Action Needed
Casing Intact with no Cracking	Inspected	Pass	No Action Needed	Arcing Contacts	Inspected	Pass	No Action Needed
Bolt Torque Levels Checked	NA/DLRO	Pass	No Action Needed	Arc Chutes	Inspected	Pass	No Action Needed
Breaker Operates Correctly	Inspected	Pass	No Action Needed	Auxiliary Devices	Inspected	Pass	No Action Needed
Frame Size & Trip Unit Correct	Inspected	Pass	No Action Needed				
Terminals Suitable for 75deg C	Inspected	Pass	No Action Needed	Overcurrent Device Battery	Inspected	Pass	No Action Needed

Overall Visual Inspection PASSED INSPECTION

Settings as Found

			Function			Pickup				Delay
GroundFault 3W	Rating Plug	1600	Long	1	X	1600 A	=	1600	A	4
	Sensor Tap	1600	Short	3	X	1600 A	=	4800	A	2 (Out)
			Instantaneous	6	X	1600 A	=	9600	A	
			Ground Fault	0.46	X	1600 A	=	736	A	1 (Out)

Settings as Left

			Function			Pickup				Delay
GroundFault 3W	Rating Plug	1600	Long	1	X	1600 A	=	1600	A	4
	Sensor Tap	1600	Short	3	X	1600 A	=	4800	A	2 (Out)
			Instantaneous	6	X	1600 A	=	9600	A	
			Ground Fault	0.46	X	1600 A	=	736	A	1 (Out)

Timing Tests

Trip Curve (TCC) Number: GES-9913

Function	Test Amps	Current Multiple	Time Band Minimum	Time Band Maximum	As Found seconds	As Left seconds
Long Time	4800	3XIr				
	LTPU (amps)					
Short Time	7200	4.5XIr				
	STPU (amps)					
Instantaneous	9600	6XIn				
	IPU (amps)					
Ground Fault	1100	1XIn				
	GFPU (amps)					

Contact Resistance Across Closed Poles

Breaker Current Rating	1600	Amps
Maximum Percent Load	100%	%
Maximum Load	1600	

	Measurements µΩ	Deviation	Deviation Pass or Fail	Overall Pass or Fail
Phase A		#NUM!	PASS	PASS
Phase B		#NUM!	PASS	
Phase C		#NUM!	PASS	

Insulation Resistance

Breaker Voltage Rating	600	VAC Phase to Phase
Minimum Test Voltage	1000	kVDC
Test Voltage Used	1000	kVDC
Test Duration per Reading	60	Seconds

Insulation Temperature	25	°C		
Temperature Correction Factor	1.25			
Minimum Insulation Resistance	100	MΩ		

State	Points	Measurements MΩ	Corrected for °C MΩ	Pass or Fail
Closed	A to B		0	PASS
Closed	B to C		0	PASS
Closed	C to A		0	PASS
Closed	A to G		0	PASS
Closed	B to G		0	PASS
Closed	C to G		0	PASS
Open	A Line - Load		0	PASS
Open	B Line - Load		0	PASS
Open	C Line - Load		0	PASS
Any	Control Wiring		0	PASS

OVERALL PASS/FAIL: FAIL

Comments:

Deficiencies: Will not rack out. Must de-energize bus and troubleshoot to repair.

ELECTRO TEST
OAHU, HAWAII

NETA ACCREDITED COMPANY

Insulated Case Circuit Breaker Test and Inspection
SBB

Customer **American Electric**		Site **Lihue International Airport**	Agreement Number **ET21-121**
Date **3/24/2022**	Technician **Jared Helminen**	Location **Lihue, HI**	Equipment Tag ID **SBB**
Manufacturer **General Electric**		Model **Power Break**	SERIAL NUMBER **50151**
Test Equipment Used (Calibration Numbers) **MEGGER DDA 1600 (Fluke 1587,AEMC 6240)**		Test Equipment Last Calibration Date **8/20/2020**	Substation **Primary**

Nameplate

Ambient Temperature	25	°C	Trip Unit Type	MVT+		CAT number	PP1616TT
Humidity	60	%	Trip Unit Catalog Number	C216LSIG		Cubicle Code	N/A
Breaker Type	GE Power Breaker		Frame Size	1600	Amps	Sensor Taps	1600
Fuse Catalog Number	N/A						
Counter as Found	N/A		Mounting	Thermal Memory			
Counter As Left	N/A		Draw-Out	ON			

ZONE INTERLOCK OFF
GF ON

Inspection

Proper Mounting	Inspected	Pass	No Action Needed	Insulating Members	Inspected	Pass	No Action Needed
Conductors Match Single Line	YES	Pass	No Action Needed	Structural Members	Inspected	Pass	No Action Needed
Feeder Designation Match Drawing	Inspected	Pass	No Action Needed	Contact Fingers	Inspected	Pass	No Action Needed
Casing Intact with no Cracking	Inspected	Pass	No Action Needed	Arcing Contacts	Inspected	Pass	No Action Needed
Bolt Torque Levels Checked	NA/DLRO	Pass	No Action Needed	Arc Chutes	Inspected	Pass	No Action Needed
Breaker Operates Correctly	Inspected	Pass	No Action Needed	Auxiliary Devices	Inspected	Pass	No Action Needed
Frame Size & Trip Unit Correct	Inspected	Pass	No Action Needed				
Terminals Suitable for 75deg C	Inspected	Pass	No Action Needed	Overcurrent Device Battery	Inspected	Pass	No Action Needed

Overall Visual Inspection PASSED INSPECTION

Settings as Found

			Function								Delay
	Rating Plug	1600	Long	1	X	1600	A	=	1600	A	4
GroundFault	Sensor Tap	1600	Short	3	X	1600	A	=	4800	A	2 (Out)
3W			Instantaneous	6	X	1600	A	=	9600	A	
			Ground Fault	0.46	X	1600	A	=	736	A	1 (Out)

Settings as Left

			Function								Delay
	Rating Plug	1600	Long	1	X	1600	A	=	1600	A	4
GroundFault	Sensor Tap	1600	Short	3	X	1600	A	=	4800	A	2 (Out)
3W			Instantaneous	6	X	1600	A	=	9600	A	
			Ground Fault	0.46	X	1600	A	=	736	A	1 (Out)

Timing Tests

Trip Curve (TCC) Number: GES-9913

Function	Test Amps	Current Multiple	Time Band Minimum	Time Band Maximum	As Found seconds	As Left seconds
Long Time	4800	3XIr	80	120	94.99	94.99
	LTPU (amps)					0
Short Time	7200	4.5XIr	0.22	0.32	0.25	0.25
	STPU (amps)					0
Instantaneous	9600	6XIn	0.01	0.07	0.05	0.05
	IPU (amps)					0
Ground Fault	1100	1XIn	0.08	0.17	0.12	0.12
	GFPU (amps)					0

Contact Resistance Across Closed Poles

Breaker Current Rating	1600	Amps
Maximum Percent Load	100%	%
Maximum Load	1600	

	Measurements µΩ	Deviation	Deviation Pass or Fail	Overall Pass or Fail
Phase A	26	18.18%	PASS	PASS
Phase B	22	0.00%	PASS	
Phase C	23	4.55%	PASS	

Insulation Resistance

Breaker Voltage Rating	600	VAC Phase to Phase
Minimum Test Voltage	1000	kVDC
Test Voltage Used	1000	kVDC
Test Duration per Reading	60	Seconds

Insulation Temperature	25	°C	
Temperature Correction Factor	1.25		
Minimum Insulation Resistance	100	MΩ	

State	Points	Measurements MΩ	Corrected for °C MΩ	Pass or Fail
Closed	A to B	155	193.75	PASS
Closed	B to C	110	137.5	PASS
Closed	C to A	225	281.25	PASS
Closed	A to G	105	131.25	PASS
Closed	B to G	100	125	PASS
Closed	C to G	115	143.75	PASS
Open	A Line - Load	2200	2750	PASS
Open	B Line - Load	330	412.5	PASS
Open	C Line - Load	453	566.25	PASS
Any	Control Wiring	2200	2750	PASS

OVERALL PASS/FAIL: PASS

Comments

Deficiencies

AUTOMATIC TRANSFER SWITCHES

ELECTRO TEST
OAHU, HAWAII

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AUTOMATIC TRANSFER SWITCH TEST

ATS 1

Customer		Site	Agreement Number
American Electric		**Lihue International Airport**	**ET22-121**
Date	Technician	Location	Equipment Tag ID
3/21/2022	**Brad Helminen**	**Lihue, HI**	**ATS 1**
Manufacturer		Model	Serial Number
CAT		**MX 250**	**TSC01892**
Test Equipment Used (Calibration Numbers)		Test Equipment Last Calibration Date	
MEGGER MPRT 8430		**Sep-21**	

CATALOG NO. 2502265 TYPE MX AMPACITY 1200 Amps
WIRING NO. CFS SYSTEM VOLTAGE L-L 480
AMBIENT TEMP. 25 °C HUMIDITY: 66 % MICROPROCESSOR
INSTALLED OPTIONS

DESCRIPTION	INSPECTED	CONDITION	CLEAN/LUBE
OVERALL CLEANLINESS	YES	GOOD	C/L
INSULATING MEMBERS	YES	GOOD	C/L
MECHANICAL CONNECTIONS	YES	GOOD	C/L
STRUCTURAL MEMBERS	YES	DIRTY	C/L
MAIN CONTACTS	YES	EXCELLENT	NA

DESCRIPTION	INSPECTED	CONDITION	CLEAN/LUBE
ARCING CHUTES	YES	DIRTY	C
OPERATING MECHANISM	YES	GOOD	C/L
CONTACT SEQUENCE	YES	GOOD	C
GROUND CONNECTION	YES	GOOD	C
AUXILIARY DEVICES	YES	GOOD	C

TIME DELAYS		SPECIFIED		AS FOUND		AS LEFT	
OVERRIDE MOMENTARY OUTAGES FACTORY SET @ 3 SEC		3 SEC		3.178		3.178	
TRANSFER TO EMERGENCY ADJUSTMENT FACTORY SET @ 1 + 5 SEC		1 SEC		1.631		1.631	
NO LOAD ENGINE COOL DOWN ADJUSTMENT FACTORY SET @ 5 MIN		300 SEC		301.5 SEC		301.5 SEC	
RE-TRANSFER TO NORMAL ADJUSTMENT FACTORY SET @ 30 MIN		1800 SEC		1801.41 SEC		1801.41 SEC	
SENSOR SETTINGS NOMINAL VOLTAGE:		VOLTS & HZ	%	VOLTS & HZ	%	VOLTS & HZ	%
NORMAL SOURCE PICKUP VOLTAGE	PHASE A	432	90	433.5	90.31%	433.5	90.31%
ADJUSTMENT RANGE:	PHASE B	432	90	433.5	90.31%	433.5	90.31%
FACTORY SET @ 90 %	PHASE C	432	90	433.5	90.31%	433.5	90.31%
NORMAL SOURCE DROPOUT VOLTAGE	PHASE A	384	80	384.9	80.19%	384.9	80.19%
ADJUSTMENT RANGE:	PHASE B	384	80	384.9	80.19%	384.9	80.19%
FACTORY SET @ 80 %	PHASE C	384	80	384.9	80.19%	384.9	80.19%
EMERGENCY SOURCE VOLTAGE	PICKUP	432	90	437.1	91.06%	437.1	91.06%
FACTORY SET @ 80 %	DROPOUT	384	80	386.3	80.48%	386.3	80.48%
EMERGENCY SOURCE FREQUENCY	PICKUP	57	95	57.06	95.10%	57.06	95.10%
FACTORY SET @ 90 %	DROPOUT	54	90	53.78	89.63%	53.78	89.63%

Comments: Contact Resistance Normal A = 69 B = 65 C = 71 Contact Resistance Emergency A = 88 B = 81 C = 86

Deficiencies: Several bulbs need to be replaced on the indicating panel of the door. This does not affect the operation of the switch.

ELECTRO TEST
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AUTOMATIC TRANSFER SWITCH TEST

ATS 2

Customer **American Electric**		Site **Lihue International Airport**	Agreement Number **ET22-121**
Date **3/21/2022**	Technician **Brad Helminen**	Location **Lihue, HI**	Equipment Tag ID **ATS 2**
Manufacturer **CAT**		Model **MX 250**	Serial Number **TSC01593**
Test Equipment Used (Calibration Numbers) **MEGGER MPRT 8430**		Test Equipment Last Calibration Date **Sep-21**	

CATALOG NO. 2502265 TYPE MX AMPACITY 1200 Amps
WIRING NO. CFS SYSTEM VOLTAGE L-L 480
AMBIENT TEMP. 25 °C HUMIDITY: 66 % MICROPROCESSOR
INSTALLED OPTIONS

DESCRIPTION	INSPECTED	CONDITION	CLEAN/LUBE
OVERALL CLEANLINESS	YES	GOOD	C/L
INSULATING MEMBERS	YES	GOOD	C/L
MECHANICAL CONNECTIONS	YES	GOOD	C/L
STRUCTURAL MEMBERS	YES	DIRTY	C/L
MAIN CONTACTS	YES	EXCELLENT	NA

DESCRIPTION	INSPECTED	CONDITION	CLEAN/LUBE
ARCING CHUTES	YES	DIRTY	C
OPERATING MECHANISM	YES	GOOD	C/L
CONTACT SEQUENCE	YES	GOOD	C
GROUND CONNECTION	YES	GOOD	C
AUXILIARY DEVICES	YES	GOOD	C

TIME DELAYS		SPECIFIED		AS FOUND		AS LEFT	
OVERRIDE MOMENTARY OUTAGES FACTORY SET @ 3 SEC		3 SEC		3 SEC		3 SEC	
TRANSFER TO EMERGENCY ADJUSTMENT FACTORY SET @ 1 SEC		1 SEC		1 SEC		1 SEC	
NO LOAD ENGINE COOL DOWN ADJUSTMENT FACTORY SET @ 5 MIN		300 SEC		300 SEC		300 SEC	
RE-TRANSFER TO NORMAL ADJUSTMENT FACTORY SET @ 10 MIN		600 SEC		600 SEC		600 SEC	
SENSOR SETTINGS	NOMINAL VOLTAGE:	VOLTS & HZ	%	VOLTS & HZ	%	VOLTS & HZ	%
NORMAL SOURCE PICKUP VOLTAGE	PHASE A	432	90	---*	'--*	---*	'--*
ADJUSTMENT RANGE:	PHASE B	432	90	---*	'--*	---*	'--*
FACTORY SET @ 90 %	PHASE C	432	90	---*	'--*	---*	'--*
NORMAL SOURCE DROPOUT VOLTAGE	PHASE A	384	80	---*	'--*	---*	'--*
ADJUSTMENT RANGE:	PHASE B	384	80	---*	'--*	---*	'--*
FACTORY SET @ 80 %	PHASE C	384	80	---*	'--*	---*	'--*
EMERGENCY SOURCE VOLTAGE ADJUSTMENT	PICKUP	432	90	---*	'--*	---*	'--*
FACTORY SET @ 80 %	DROPOUT	384	80	---*	'--*	---*	'--*
EMERGENCY SOURCE FREQUENCY	PICKUP	57	95	---*	'--*	---*	'--*
FACTORY SET @ 90 %	DROPOUT	54	90	---*	'--*	---*	'--*

Comments:

Deficiencies: The ATS was functional tested by simulating an outage, but could not be fully tested as the automatic portion of the bypass-isolation switch will not rack out. Several bulbs need to be replaced on the indicating panel of the door. This does not affect the operation of the switch.

ELECTRO TEST
OAHU, HAWAII

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AUTOMATIC TRANSFER SWITCH TEST

ATS 4

Customer **American Electric**		Site **Lihue International Airport**	Agreement Number **ET22-121**
Date **1/26/2021**	Technician **Brad Helminen**	Location **Lihue, HI**	Equipment Tag ID **ATS 4**
Manufacturer **WESTINGHOUSE**		Model **ATC-600**	Serial Number **52359**
Test Equipment Used (Calibration Numbers) **MEGGER MPRT 8430**		Test Equipment Last Calibration Date **Sep-21**	

CATALOG NO. 2D78589G50 TYPE ATVSP AMPACITY 3000 Amps
WIRING NO. 5724B09 SYSTEM VOLTAGE L-L 480
AMBIENT TEMP. 25 °C HUMIDITY: 66 % MICROPROCESSOR
INSTALLED OPTIONS

DESCRIPTION	INSPECTED	CONDITION	CLEAN/LUBE
OVERALL CLEANLINESS	YES	GOOD	C/L
INSULATING MEMBERS	YES	GOOD	C/L
MECHANICAL CONNECTIONS	YES	GOOD	C/L
STRUCTURAL MEMBERS	YES	DIRTY	C/L
MAIN CONTACTS	YES	EXCELLENT	NA

DESCRIPTION	INSPECTED	CONDITION	CLEAN/LUBE
ARCING CHUTES	YES	DIRTY	C
OPERATING MECHANISM	YES	GOOD	C/L
CONTACT SEQUENCE	YES	GOOD	C
GROUND CONNECTION	YES	GOOD	C
AUXILIARY DEVICES	YES	GOOD	C

TIME DELAYS		SPECIFIED		AS FOUND		AS LEFT	
OVERRIDE MOMENTARY OUTAGES FACTORY SET @ 3 SEC		3 SEC		3.21 SEC		3.21 SEC	
TRANSFER TO EMERGENCY ADJUSTMENT FACTORY SET @ 1 + 5 SEC		6 SEC		6.18 SEC		6.18 SEC	
NO LOAD ENGINE COOL DOWN ADJUSTMENT FACTORY SET @ 2 MIN		120 SEC		119.68 SEC		119.68 SEC	
RE-TRANSFER TO NORMAL ADJUSTMENT FACTORY SET @ 5 MIN		300 SEC		300.4 SEC		300.4 SEC	
SENSOR SETTINGS	NOMINAL VOLTAGE:	VOLTS & HZ	%	VOLTS & HZ	%	VOLTS & HZ	%
NORMAL SOURCE PICKUP VOLTAGE ADJUSTMENT RANGE: FACTORY SET @ 90 %	PHASE A	432	90	435.60	90.75%	435.6	90.75%
	PHASE B	432	90	435.60	90.75%	435.6	90.75%
	PHASE C	432	90	435.60	90.75%	435.6	90.75%
NORMAL SOURCE DROPOUT VOLTAGE ADJUSTMENT RANGE: FACTORY SET @ 80 %	PHASE A	384	80	389.50	81.15%	389.5	81.15%
	PHASE B	384	80	389.50	81.15%	389.5	81.15%
	PHASE C	384	80	389.50	81.15%	389.5	81.15%
EMERGENCY SOURCE VOLTAGE FACTORY SET @ 80 %	PICKUP	432	90	435.1	90.65%	435.1	90.65%
	DROPOUT	384	80	387.3	80.69%	387.3	80.69%
EMERGENCY SOURCE FREQUENCY FACTORY SET @ 90 %	PICKUP	57.6	95	57.58	95.97%	57.58	95.97%
	DROPOUT	56.4	90	56.42	94.03%	56.42	94.03%

Comments:

Deficiencies:

ELECTRO TEST
OAHU, HAWAII

NETA ACCREDITED COMPANY

AUTOMATIC TRANSFER SWITCH TEST

Maintenance Baseyard ATS

Customer **American Electric**		Site **Lihue International Airport**	Agreement Number **ET22-121**
Date **3/22/2022**	Technician **Brad Helminen**	Location **Lihue, HI**	Equipment Tag ID **Maintenance Baseyard ATS**
Manufacturer **CAT**		Model **MX 150**	Serial Number **TSA12651**
Test Equipment Used (Calibration Numbers) **MEGGER MPRT 8430**		Test Equipment Last Calibration Date **Sep-21**	

CATALOG NO. 1526846 TYPE MX AMPACITY 400 Amps
WIRING NO. CTG SYSTEM VOLTAGE L-L 480
AMBIENT TEMP. 24 °C HUMIDITY: 67 % MICROPROCESSOR
INSTALLED OPTIONS

DESCRIPTION	INSPECTED	CONDITION	CLEAN/LUBE
OVERALL CLEANLINESS	YES	DIRTY	C/L
INSULATING MEMBERS	YES	DIRTY	C/L
MECHANICAL CONNECTIONS	YES	GOOD	C/L
STRUCTURAL MEMBERS	YES	DIRTY	C/L
MAIN CONTACTS	YES	EXCELLENT	NA

DESCRIPTION	INSPECTED	CONDITION	CLEAN/LUBE
ARCING CHUTES	YES	DIRTY	C
OPERATING MECHANISM	YES	GOOD	C/L
CONTACT SEQUENCE	YES	GOOD	C
GROUND CONNECTION	YES	GOOD	C
AUXILIARY DEVICES	YES	GOOD	C

TIME DELAYS			SPECIFIED		AS FOUND		AS LEFT	
OVERRIDE MOMENTARY OUTAGES FACTORY SET @ 3 SEC			5 SEC		5.200 SEC		5.200 SEC	
TRANSFER TO EMERGENCY FACTORY SET @ 1 SEC			1 SEC		1.263 SEC		1.263 SEC	
NO LOAD ENGINE COOL DOWN FACTORY SET @ 5 MIN			300 SEC		301.5 SEC		301.5 SEC	
RE-TRANSFER TO NORMAL FACTORY SET @ 15 MIN			900 SEC		900.0 SEC		900.0 SEC	
SENSOR SETTINGS	NOMINAL VOLTAGE:		VOLTS & HZ	%	VOLTS & HZ	%	VOLTS & HZ	%
NORMAL SOURCE PICKUP VOLTAGE		PHASE A	432	90	434.5	90.52%	434.5	90.52%
ADJUSTMENT RANGE:		PHASE B	432	90	434.5	90.52%	434.5	90.52%
FACTORY SET @ 90 %		PHASE C	432	90	434.5	90.52%	434.5	90.52%
NORMAL SOURCE DROPOUT VOLTAGE		PHASE A	384	80	386.1	80.44%	386.1	80.44%
ADJUSTMENT RANGE:		PHASE B	384	80	386.1	80.44%	386.1	80.44%
FACTORY SET @ 80 %		PHASE C	384	80	386.1	80.44%	386.1	80.44%
EMERGENCY SOURCE VOLTAGE		PICKUP	456	95	451.7	94.10%	451.7	94.10%
FACTORY SET @ 85 %		DROPOUT	408	85	405.5	84.48%	405.5	84.48%
EMERGENCY SOURCE FREQUENCY		PICKUP	57	95	56.7	94.50%	56.7	94.50%
FACTORY SET @ 90 %		DROPOUT	54	90	53.9	89.83%	53.9	89.83%

Comments: Contact Resistance Normal A = 240 B = 285 C = 235 Contact Resistance Emergency A = 672 B = 528 C = 498

Deficiencies:

ELECTRO TEST
OAHU, HAWAII

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AUTOMATIC TRANSFER SWITCH TEST

Control Tower (Airfield) ATS

Customer **American Electric**		Site **Lihue International Airport**	Agreement Number **ET22-121**
Date **3/23/2022**	Technician **Jesse Helminen/Brad Helminen**	Location **Lihue, HI**	Equipment Tag ID **Control Tower (Airfield) ATS**
Manufacturer **ASCO**		Model **7000 Series**	Serial Number **134670**
Test Equipment Used (Calibration Numbers) **MEGGER MPRT 8430**		Test Equipment Last Calibration Date **Sep-21**	

CATALOG NO. E7ADTBA3260N5XC TYPE 7000 AMPACITY 260 Amps
WIRING NO. 617427-015 SYSTEM VOLTAGE L-L 480
AMBIENT TEMP. 20 °C HUMIDITY: 41 % MICROPROCESSOR
INSTALLED OPTI

DESCRIPTION	INSPECTED	CONDITION	CLEAN/LUBE
OVERALL CLEANLINESS	YES	GOOD	C/L
INSULATING MEMBERS	YES	GOOD	C/L
MECHANICAL CONNECTIONS	YES	GOOD	C/L
STRUCTURAL MEMBERS	YES	DIRTY	C/L
MAIN CONTACTS	YES	EXCELLENT	NA

DESCRIPTION	INSPECTED	CONDITION	CLEAN/LUBE
ARCING CHUTES	YES	DIRTY	C
OPERATING MECHANISM	YES	FAILED	C/L
CONTACT SEQUENCE	YES	POOR	C
GROUND CONNECTION	YES	GOOD	C
AUXILIARY DEVICES	YES	FAILED	C

TIME DELAYS		SPECIFIED		AS FOUND		AS LEFT	
OVERRIDE MOMENTARY OUTAGES FACTORY SET @ 2 SEC		2 SEC		2.104 SEC		2.104 SEC	
TRANSFER TO EMERGENCY ADJUSTMENT FACTORY SET @ 0 SEC		0 SEC		0.028 SEC		0.028 SEC	
NO LOAD ENGINE COOL DOWN FACTORY SET @ 1 MIN		60 SEC		58.70 SEC		58.70 SEC	
RE-TRANSFER TO NORMAL ADJUSTMENT FACTORY SET @ 30 MIN		1800 SEC		1799 SEC		1799 SEC	
SENSOR SETTINGS NOMINAL VOLTAGE:		VOLTS & HZ	%	VOLTS & HZ	%	VOLTS & HZ	%
NORMAL SOURCE PICKUP VOLTAGE	PHASE A	432	90	434.8	90.58%	434.8	90.58%
ADJUSTMENT RANGE:	PHASE B	432	90	434.8	90.58%	434.8	90.58%
FACTORY SET @ 90 %	PHASE C	432	90	434.8	90.58%	434.8	90.58%
NORMAL SOURCE DROPOUT VOLTAGE	PHASE A	408	85	409.1	85.23%	409.1	85.23%
ADJUSTMENT RANGE:	PHASE B	408	85	409.1	85.23%	409.1	85.23%
FACTORY SET @ 80 %	PHASE C	408	85	409.1	85.23%	409.1	85.23%
EMERGENCY SOURCE VOLTAGE	PICKUP	432	90	434.8	90.58%	434.8	90.58%
FACTORY SET @ 85 %	DROPOUT	360	75	360.4	75.08%	360.4	75.08%
EMERGENCY SOURCE FREQUENCY	PICKUP	57	95	57.000	95.00%	57	95.00%
FACTORY SET @ 90 %	DROPOUT	54	90	54.000	90.00%	54	90.00%

Comments: The controller was able to be tested, but the mechanical switch has failed on this unit.

Deficiencies: During bypass operation to test this switch, the operating mechanism failed. The bypass mechanism of the switch cannot be inserted back into the main contacts without repairs or replacement. The manufacture date on this switch is 02/2001 and due to the age and corrosion in the unit we reccomend replacment with a modern switch. One of the (2) transfer coils has failed on this unit also.

ELECTRO TEST
OAHU, HAWAII

NETA ACCREDITED COMPANY

AUTOMATIC TRANSFER SWITCH TEST

ARFF ATS

Customer **American Electric**		Site **Lihue International Airport**	Agreement Number **ET22-121**
Date **3/22/2022**	Technician **Brad Helminen**	Location **Lihue, HI**	Equipment Tag ID **ARFF ATS**
Manufacturer **ASCO**		Model **Group 7 Series 940 962**	Serial Number **693253004**
Test Equipment Used (Calibration Numbers) **MEGGER MPRT 8430**		Test Equipment Last Calibration Date **Sep-21**	

CATALOG NO. E7623600471C TYPE ASCO AMPACITY 600 Amps
WIRING NO. 459666-002H SYSTEM VOLTAGE L-L 208
AMBIENT TEMP. 20 °C HUMIDITY: 80 % MICROPROCESSOR
INSTALLED OPT

DESCRIPTION	INSPECTED	CONDITION	CLEAN/LUBE
OVERALL CLEANLINESS	YES	DIRTY/CORRODED	C/L
INSULATING MEMBERS	YES	DIRTY/CORRODED	C/L
MECHANICAL CONNECTIONS	YES	DIRTY/CORRODED	C/L
STRUCTURAL MEMBERS	YES	DIRTY	C/L
MAIN CONTACTS	YES	GOOD	NA

DESCRIPTION	INSPECTED	CONDITION	CLEAN/LUBE
ARCING CHUTES	YES	DIRTY	C
OPERATING MECHANISM	YES	DIRTY/CORRODED	C/L
CONTACT SEQUENCE	YES	DIRTY/CORRODED	C
GROUND CONNECTION	YES	GOOD	C
AUXILIARY DEVICES	YES	DEFECTIVE NON WORKING	C

TIME DELAYS		SPECIFIED	AS FOUND	AS LEFT
OVERRIDE MOMENTARY OUTAGES FACTORY SET @ 3 SEC		3 SEC	NA	NA
TRANSFER TO EMERGENCY FACTORY SET @ 0 SEC		0 SEC	NA	NA
NO LOAD ENGINE COOL DOWN FACTORY SET @ 5 MIN		300 SEC	NA	NA
RE-TRANSFER TO NORMAL FACTORY SET @ 5 MIN		300 SEC	NA	NA
SENSOR SETTINGS NOMINAL VOLTAGE:		VOLTS & HZ / %	VOLTS & HZ / %	VOLTS & HZ / %
NORMAL SOURCE PICKUP VOLTAGE ADJUSTMENT RANGE: FACTORY SET @ 90 %	PHASE A	187.2 / 90	0 / 0.00%	0 / 0.00%
	PHASE B	187.2 / 90	0 / 0.00%	0 / 0.00%
	PHASE C	187.2 / 90	0 / 0.00%	0 / 0.00%
NORMAL SOURCE DROPOUT VOLTAGE ADJUSTMENT RANGE: FACTORY SET @ 80 %	PHASE A	166.4 / 80	0 / 0.00%	0 / 0.00%
	PHASE B	166.4 / 80	0 / 0.00%	0 / 0.00%
	PHASE C	166.4 / 80	0 / 0.00%	0 / 0.00%
EMERGENCY SOURCE VOLTAGE FACTORY SET @ 80 %	PICKUP	187.2 / 90	0 / 0.00%	0 / 0.00%
	DROPOUT	166.4 / 80	0 / 0.00%	0 / 0.00%
EMERGENCY SOURCE FREQUENCY FACTORY SET @ 90 %	PICKUP	57 / 95	0 / 0.00%	0 / 0.00%
	DROPOUT	51 / 85	0 / 0.00%	0 / 0.00%

Comments:

Deficiencies: THIS SWITCH DOES NOT OPERATE MECHANICALLY OR ELECTRICALLY AND WILL NEED TO BE REPLACED. THE BYPASS MECHANISM IS INOPERABLE SO TESTING CANNOT BE COMPLETED.

AIR-EM 22.0325 BK1321-53 Addendum No. 1 (Rev. 1)

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