



Infrared Scans * ATS Testing * Vibration Analysis * 1 Line Electrical
Drawings * Arc Flash Hazard Analysis & Training

Facility Name
123 West Main Street
Bolder, CO 65432

Inspection Start: 3/28/2020

Infrared Electrical Inspection Report

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Thank You! True Technical Services, LLC has recently performed service at your facility. The following pages of this report contain important information about the possible safety of your personnel and the reliability of your equipment. True Tech has used one or more predictive maintenance tools to assist you in attaining the health status of your equipment. We encourage you to consult with your engineering staff before making a final determination on repairs. True Technical Services, LLC assumes no liability directly or indirectly as a result of this service.

The **inventory** contains a list of all equipment designated by your facility for inspection. Equipment that was tested will be labeled “TESTED” on the inventory sheet. If a problem was noted with this equipment, it will list a page number that corresponds with a defect page contained in this report. Some items on the list may have not been tested “NL or NA” due to: accessibility to equipment, equipment offline, or other barrier. Testing lightly loaded equipment may produce inconclusive results. The overall responsibility of knowing the equipment loading and status falls upon facility personnel.

The **defect** pages are listed directly after the inventory pages. Any anomaly(s) noted during the course of your service will be recorded on the defect pages. Each defect page will contain the data gathered, recommendations, and the criticality rating (see table).

Criticality Table	
****	100°F and > ΔT (Temperature Difference) Failure Imminent, Repair Immediately or ASAP
***	65°F - 99°F ΔT (Temperature Difference) Failure Likely, Repair ASAP
**	45°F - 64°F ΔT (Temperature Difference) Failure Possible, Schedule Repair
*	20°F - 44°F ΔT (Temperature Difference) Immediate Failure Unlikely, Repair as Time Permits

The **criticality rating** of your equipment was assigned by your technician based on a number of factors which may include some or all of the following: industry standard temperature scale, loading, significance of asset, safety, technicians experience, and other predictive maintenance technologies.

We appreciate the opportunity to serve you. If you have any questions regarding this report, we are happy to assist in any way.

Wesley Kasey - President
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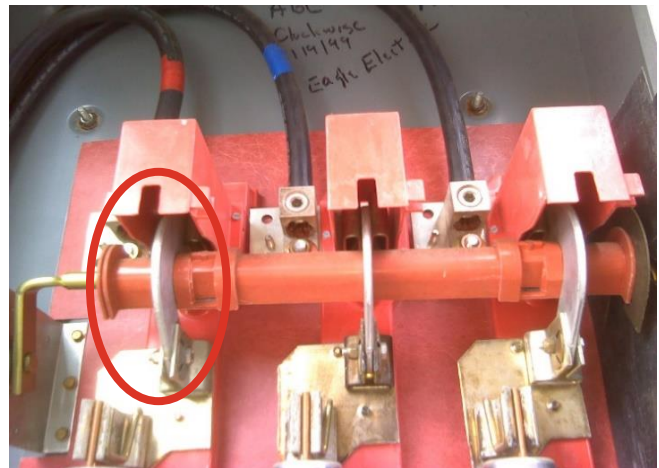
Location	Equipment	Equipment Name	Status	Anomaly
CEP-POWERHOUSE				
Main Elect-Emergency	Switchboard	CP-GDP (No Load)	NL	None Noted
Main Elect-Emergency	Switchboard	IJ-GDP (No Load)	NL	None Noted
Main Elect-Emergency	Auto Transfer Switch	CP-SHD	Tested	None Noted
Main Elect-Emergency	Auto Transfer Switch	CP-QHD	Tested	None Noted
Main Elect-Emergency	Panel	CP-SHD	Tested	Yes, #1
Main Elect-Emergency	Panel	CP-SLA	Tested	None Noted
Main Elect-Emergency	Transformer	CP-SLA	Tested	None Noted
Main Elect-Normal	Auto Transfer Switch	CP-NHD	Tested	None Noted
Main Elect-Normal	Panel	CP-NHD	Tested	None Noted
Main Elect-Normal	Panel	CP-NLA	Tested	None Noted
Main Elect-Normal	Transformer	CP-NLA	Tested	None Noted
Main Elect-Normal	Switchboard	H-MSB	Tested	None Noted
Main Elect-Normal	Switchboard	CP-MSB	Tested	None Noted
Boiler Room	Control Panel	DA-1	Tested	None Noted
Boiler Room	Variable Freq Drive	HWP-1	NL	None Noted
Boiler Room	Variable Freq Drive	HWP-2	Tested	None Noted
Boiler Room	Control Panel	Boiler 1.	Tested	None Noted
Boiler Room	Disconnect	Boiler 1	Tested	None Noted
Boiler Room	Disconnect	Boiler 2.	NL	None Noted
Boiler Room	Control Panel	Boiler 2.	NL	None Noted
Boiler Room	Control Panel	MedAir	Tested	None Noted
Boiler Room	Control Panel	MedVac	Tested	None Noted
Boiler Room	Panel	CP-QHM	Tested	None Noted
Boiler Room	Auto Transfer Switch	CP-QHM	Tested	None Noted
Chiller Room	Variable Freq Drive	SCHP-1	NL	None Noted
Chiller Room	Variable Freq Drive	SCHP-2	Tested	None Noted
Chiller Room	Variable Freq Drive	CWP-1	Tested	None Noted
Chiller Room	Variable Freq Drive	CWP-2	Tested	None Noted
Chiller Room	Variable Freq Drive	CHWP-1	Tested	None Noted
Chiller Room	Variable Freq Drive	CHWP-2	NL	None Noted
Chiller Room	Variable Freq Drive	CT-1	Tested	None Noted
Chiller Room	Variable Freq Drive	CT-2	Tested	None Noted
Chiller Room	Switchboard	CP-QHD	Tested	None Noted
Chiller Room	Panel	CP-QLA	Tested	Yes, #2
Chiller Room	Transformer	CP-QLA	Tested	None Noted
Chiller Room	Control Panel	Chiller 1	Tested	None Noted
Chiller Room	Control Panel	Chiller 2	Tested	None Noted
Chiller Room	Disconnect	CT-1 (outside)	Tested	None Noted
Chiller Room	Disconnect	CT-2 (outside)	Tested	None Noted
Electrical Rm at Maint Shop	Panel	CLE	Tested	None Noted
Electrical Rm at Maint Shop	Panel	NLE	Tested	None Noted

Location	Equipment	Equipment Name	Status	Anomaly
Kitchen	Panel	NLK	Tested	None Noted
Kitchen	Panel	NLKA	Tested	None Noted
Electrical Rm, Cafeteria Hall	Panel	CLA-1	Tested	None Noted
Electrical Rm, Cafeteria Hall	Panel	CLA-2	Tested	None Noted
Electrical Rm, Cafeteria Hall	Panel	CHA	Tested	None Noted
Electrical Rm, Cafeteria Hall	Panel	QHA	Tested	None Noted
Electrical Rm, Cafeteria Hall	Panel	QLA	Tested	None Noted
Electrical Rm, Cafeteria Hall	Panel	SHA	Tested	Yes, #3
Electrical Rm, Cafeteria Hall	Panel	SLA	Tested	None Noted
Electrical Rm, Cafeteria Hall	Panel	NHA-1	Tested	None Noted
Electrical Rm, Cafeteria Hall	Panel	NHA-2	Tested	None Noted
Electrical Rm, Cafeteria Hall	Panel	NLA-1	Tested	None Noted
Electrical Rm, Cafeteria Hall	Panel	NLA-2	Tested	None Noted
Electrical Rm, Cafeteria Hall	Transformer	NLA	Tested	None Noted
Electrical Rm, Cafeteria Hall	Transformer	CLA	Tested	Visual
Laboratory	Panel	ULA	Tested	None Noted
MedSurge Nurse Station	Panel	CLD-1	Tested	None Noted
MedSurge Nurse Station	Panel	CLD-2	Tested	None Noted
MedSurge Nurse Station	Panel	NLD-1	Tested	None Noted
MedSurge Nurse Station	Panel	NLD-2	Tested	None Noted
MedSurge Nurse Station	Panel	NLD-3	Tested	None Noted
MedSurge Nurse Station	Panel	QLC	Tested	Yes, #4
Main Communications	Panel	UPS	Tested	None Noted
Radiology, Electrical Rm	Panel	CLB	Tested	None Noted
Radiology, Electrical Rm	Panel	NLB-1	Tested	None Noted
Radiology, Electrical Rm	Panel	NLB-2	Tested	None Noted
Radiology, Electrical Rm	Panel	QLB	Tested	None Noted
CT Room	Panel	CT	Tested	None Noted
CT Room	Panel	MP	Tested	None Noted
Emergency Resuscitation	Isolation Panel	C-13	Tested	None Noted
Emergency Resuscitation	Isolation Panel	C-14	Tested	None Noted
ER Electrical Room	Panel	NHC	Tested	None Noted
ER Electrical Room	Panel	CHC	Tested	Visual
ER Electrical Room	Panel	CLC-1	Tested	Visual
ER Electrical Room	Panel	CLC-2	Tested	None Noted
ER Electrical Room	Panel	NLC	Tested	None Noted
Surgery OR's	Isolation Panel	NI1	Tested	None Noted
Surgery OR's	Isolation Panel	NI2	Tested	None Noted
Surgery OR's	Isolation Panel	CI1	Tested	None Noted
Surgery OR's	Isolation Panel	CI2	Tested	None Noted
Mezzanine	Transformer	T-ULA	Tested	None Noted
Mezzanine	Breaker	To Transformer	Tested	None Noted
Mezzanine	UPS	UPS	Tested	None Noted

Location Outside

Anomaly # 1

Equipment Disconnect "Chiller 1"



Target Temperature	Reference Temperature	Temperature Difference	Criticality Rating
131°F	89°F	32°F	**

Amperage A	Amperage B	Amperage C	Rated Amps/Volts
107	109	121	480/480

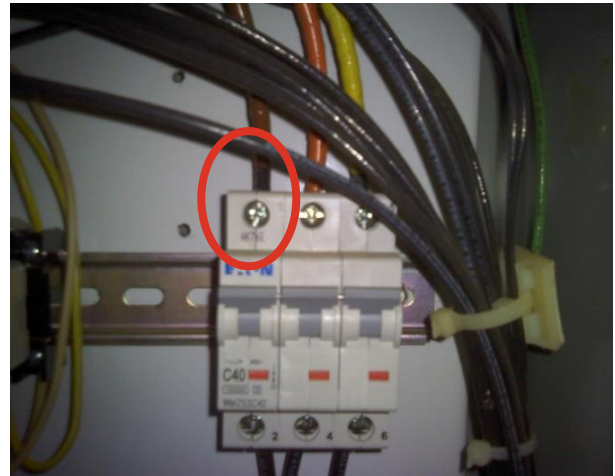
Comments: Target is the phase A knife switch in Chiller 1 disconnect. Criticality raised due to device was at 20% of full load at time of inspection. Heat will rise exponentially with loading.

Recommendations: Ensure equipment is in an "Electrically Safe" condition and consult your electrical maintenance professional before performing service! Inspect, clean and tighten the knife switch components. Inspect the pivot, and entire switch component's as well. Replace parts as needed. Validate repairs with an infrared camera or spot radiometer.

Location Holzmann Saw

Anomaly # 2

Equipment Control Panel " New North #25"



Target Temperature	Reference Temperature	Temperature Difference	Criticality Rating
199°F	125°F	74°F	****

Amperage A	Amperage B	Amperage C	Rated Amps/Volts
N/A	N/A	N/A	480

Comments: Target is the phase A line side wire lug on the C40 top right contactor. ***Contactor at lug appears to be damaged.

Recommendations: Ensure equipment is in an "Electrically Safe" condition and consult your electrical maintenance professional before performing service! Remove target wire. Inspect and clean wire and lug. Replace/Cut back wire as needed. Replace lug, conductor, or entire component as needed. Retighten connection to specifications. Check the entire assembly for looseness and discoloration. Validate repairs with an infrared camera or spot radiometer.

Location Main Mechanical

Anomaly # 3

Equipment Control Panel "Old North Dust Collector #24"



Target Temperature	Reference Temperature	Temperature Difference	Criticality Rating
165°F	103°F	62°F	***

Amperage A	Amperage B	Amperage C	Rated Amps/Volts
33	32	29	200/480

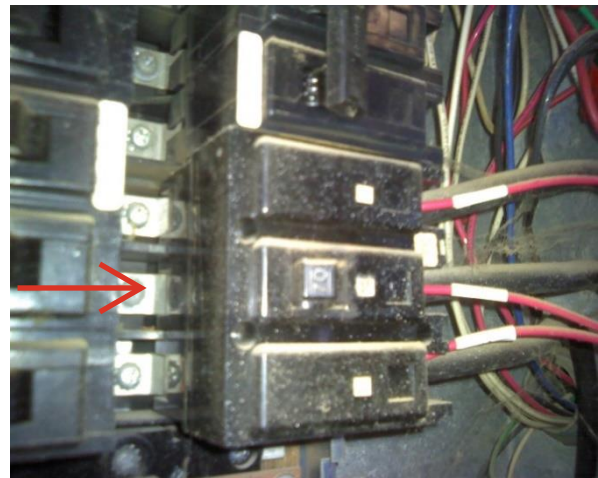
Comments: Target is the phase B line side fuse clip. This is a repeat problem from last year and is has gotten about 50% worse.

Recommendations: Ensure equipment is in an "Electrically Safe" condition and consult your electrical maintenance professional before performing service! Fuse clip is loose, dirty, or damaged. Remove the fuse and inspect the fuse ferrell and the fuse clip. Clean and tighten the lug and all Fuse holder contact points before inserting fuse. Validate repairs with an infrared camera or spot radiometer.

Location 2710 Building Warehouse Area

Anomaly # 4

Equipment Panel "Maintenance and Warehouse"



Target Temperature	Reference Temperature	Temperature Difference	Criticality Rating
189°F	103°F	86°F	***

Amperage A	Amperage B	Amperage C	Rated Amps/Volts
17	9	9	70/208

Comments: Target is the phase A (Circuit 8) buss connection on the 3 pole breaker (Circuit 8,10,12) inside panel. Consider maintenance ASAP and replace breaker.

Recommendations: Ensure equipment is in an "Electrically Safe" condition and consult your electrical maintenance professional before performing service! The buss side of the breaker is loose, dirty, or damaged. Remove the breaker and inspect both breaker and lug. Clean and tighten all contact points. Validate repairs with an infrared camera or spot radiometer If hot spot persists, replace breaker.

Location Various, see notes

Anomaly # Visual

Equipment Various, see notes



Visuals shown for your awareness.

Comments: Panel(s) C43A pictured left and RM1G pictured right above have unused openings in the electrical enclosure, missing blanks.

Recommendations: Ensure equipment is in an "Electrically Safe" condition and consult your electrical maintenance professional before performing service! This NEC violation may be noted by inspectors and is shown for your awareness.

Location Various, see notes

Anomaly # Visual

Equipment Various, see notes



Visuals shown for your awareness.

Comments: Target is transformer in Bay City Clinic Basement. Transformer had metal shipping brackets still attached at time of inspection. These are supposed to be removed by the installation contractor prior to energizing equipment. We opened the cover and removed the brackets.

Recommendations: Brackets removed, no further action recommended.

Line Isolation Monitor Maintenance Data Sheet

Equipment ID: 1013491
 Name: NI1
 Location: Surgery OR's

Electrical Tests

	L1	L2	L1-L2		
Measured Voltage:	59.5	60	119.4	Calculated Resistance:	23.88 KOhms

	L1-Gnd	L2-Gnd	Fault
IMeter	5.1	5.3	No

Physical Inspection

Is the LIM in good physical condition?	Yes
Does the meter function properly?	Yes
Does the LIM local alarm properly function?	Yes
Does the LIM remote alarm properly function?	Yes
Do all breakers operate smoothly?	Yes
Does the Test button operate normally?	Yes
Are all lights illuminated?	Yes
Are all receptacles in good condition?	Yes

Anomaly(s)	None Noted
Status	Pass

Comments and Recommendations

Comments:

Recommendations:

Line Isolation Monitor Maintenance Data Sheet

Equipment ID: _____
 Name: NI2
 Location: Surgery OR's

Electrical Tests

	L1	L2	L1-L2		Calculated Resistance:
Measured Voltage:	60.7	62.6	122		24.40 KOhms

	L1-Gnd	L2-Gnd	Fault
IMeter	5	5	No

Physical Inspection

Is the LIM in good physical condition?	Yes
Does the meter function properly?	Yes
Does the LIM local alarm properly function?	Yes
Does the LIM remote alarm properly function?	Yes
Do all breakers operate smoothly?	Yes
Does the Test button operate normally?	Yes
Are all lights illuminated?	Yes
Are all receptacles in good condition?	Yes

Anomaly(s)	None Noted
Status	Pass

Comments and Recommendations

Comments:

Recommendations:

Transfer Switch Maintenance Data Sheet

Equipment ID FM50016.389
Serial Number 884671

Manufacturer ASCO Voltage/Amp Rating 480/260
Type ATS Catalog # E940326099XC
Equipment Name ATS 3 Location Elec. Rm @ Tele.Equip. Rm

ATS Time Delays

Emer-Normal Time(Min) Engine C/D Time(Min)

Electrical Tests

	A-B	B-C	C-A	A-N/G	B-N/G	C-N/G
Normal	480.3	483.5	480.5	275.9	279.3	278.8
Emergency	478.7	478.2	478.8	276.4	276.4	276.3

	A-L	B-L	C-L	N-L
Normal mV Drop	13.2	9.5	11.8	
Emergency mV Drop	14.1	10.4	10.3	

Bypass Switch Readings			
	A	B	C
Normal mV Drop			
Emergency mV Drop			
μΩ Normal			
μΩ Emergency			

Time Delay at Generator Anomaly(s) Status

	A	B	C	N
Normal-Load (amps)	46.8	35.5	40.1	11.3
Emergency-Load	41.7	33.9	31.6	

Notes

Comments:

Recommendations:

Transfer Switch Maintenance Data Sheet

Equipment ID FM50016390
 Serial Number 484191 WE

Manufacturer ASCO Voltage/Amp Rating 480/400
 Type Bypass Catalog # J07ATBA30400N5XC
 Equipment Name Paitent Tower AHUs Location 2nd Flr. Elec. Rm @ Tele.Eq. Rm

ATS Time Delays

Emer-Normal Time(Min) Engine C/D Time(Min)

Electrical Tests

	A-B	B-C	C-A	A-N/G	B-N/G	C-N/G
Normal	479.7	482.8	480.0	276.7	278.2	278.7
Emergency	478.2	477.2	477.9	276.2	276.0	275.7

	A-L	B-L	C-L	N-L
Normal mV Drop	124.8	110.3	116.6	
Emergency mV Drop	95.5	83.7	87.2	

Bypass Switch Readings			
	A	B	C
Normal mV Drop	87.0	87.8	95.6
Emergency mV Drop			
μΩ Normal	225.6	245.6	244.6
μΩ Emergency	194.1	201.2	245.2

Time Delay at Generator Anomaly(s) Status

	A	B	C	N
Normal-Load (amps)	102.4	112.3	1148.9	
Emergency-Load	101.6	102.3	107.3	

Notes

Comments:

Recommendations:

Transfer Switch Maintenance Data Sheet

Equipment ID FM50016392
Serial Number 1612145 WE

Manufacturer ASCO Voltage/Amp Rating 480/400
Type Bypass Catalog # J7ACTBB30400N5XC
Equipment Name ATS 1 Location 2nd Flr. Elec. Rm @ Tele.Eq. Rm

ATS Time Delays

Emer-Normal Time(Min) 30 Engine C/D Time(Min) 10

Electrical Tests

	A-B	B-C	C-A	A-N/G	B-N/G	C-N/G
Normal	480.6	483.2	480.8	276.8	279.0	278.5
Emergency	477.4	476.5	477.5	275.7	275.4	275.8

	A-L	B-L	C-L	N-L
Normal mV Drop	140.8	129.3	134.0	30.3
Emergency mV Drop	119.7	105.8	107.6	25.4

Bypass Switch Readings				
	A	B	C	N
Normal mV Drop	102.2	95.1	99.4	20.5
Emergency mV Drop				
μΩ Normal	175.3	173.4	161.5	247.1/156.7
μΩ Emergency	228.5/174.6	291.7/180.1	196.8	594/206.1

Time Delay at Generator Anomaly(s) Yes
Status Tested

	A	B	C	N
Normal-Load (amps)	128.0	135.3	139.1	0.5
Emergency-Load	117.2	136.4	129.1	1.3

Notes

Comments: Contacts N-N, E-A, E-B, & E-N failed the MicroOhm test. After cleaning, a retest showed the contacts back in spec. No further action necessary. ATS was not bypassed on emergency power.

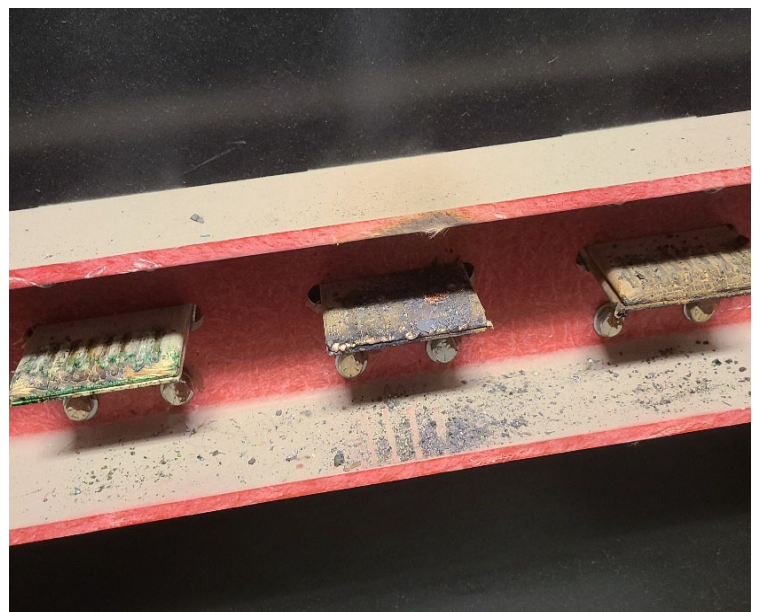
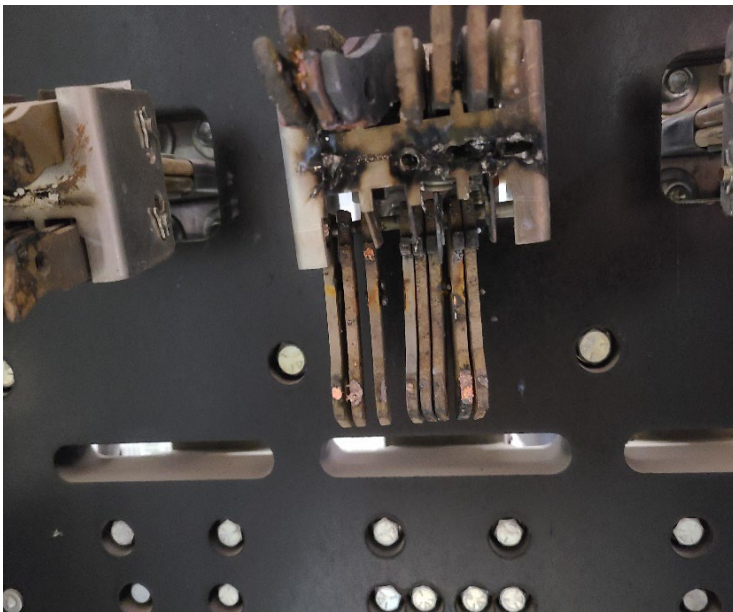
Recommendations:

Transfer Switch Maintenance Data Sheet

Equipment ID	<u>FM30086557</u>
Serial Number	<u>16626-3B</u>

Manufacturer	<u>RussElectric</u>	Voltage/Amp Rating	<u>480/1600</u>
Type	<u>Bypass</u>	Catalog #	<u>RTBD-16003CE</u>
Equipment Name	<u>ATS-1</u>	Location	<u>Elec. Rm @ Generators</u>

Notes/Pictures



Comments

Stab connections for phase B on the back of the bypass switch was severely damaged and fell apart upon removing the bypass switch from the ATS enclosure. Due to the location of the issue there was no thermal anomaly visible.

Recommendations

Have a qualified electrical contractor repair/replace the stab connections. ATS will have to be manually transitioned from normal to emergency positions until repairs are made, this will result in a brief loss of power.

Annual NFPA 70B Switchboard Inspection Data Sheet

Equipment ID: _____
 Name: CP-GDP
 Location: West Clinic Bsmt. Mech Room in MR-101



Visual Inspection

Infrared	Yes
Ultrasound	Yes
Are panel(s) accessible?	Yes
Are panel(s) covers broken or missing?	No
Signs of moisture intrusion or other damage?	No
Grounding wires in place?	Yes
Any signs of overheating/arching?	No

Notes

Notes: Both infrared and ultrasound inspection were conducted on the above switchgear. (Grating and open areas of gear were used for thermal inspection). Ultrasound was used throughout the gear to inspect for arcing, tracking and corona. No anomalies found at time of inspection. Continue annual infrared and ultrasound inspection on gear.

Annual NFPA 70B Switchboard Inspection Data Sheet

Equipment ID: _____
 Name: IJ-GDP
 Location: West Clinic Bsmt. Mech Room in MR-101



Visual Inspection

Infrared	Yes
Ultrasound	Yes
Are panel(s) accessible?	Yes
Are panel(s) covers broken or missing?	No
Signs of moisture intrusion or other damage?	No
Grounding wires in place?	Yes
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Notes

Notes: Both infrared and ultrasound inspection were conducted on the above switchgear. (Grating and open areas of gear were used for thermal inspection). Ultrasound was used throughout the gear to inspect for arching, tracking and corona. No anomalies found at time of inspection. Continue annual infrared and ultrasound inspection on gear.