

APPENDIX G

SAMPLE SYSTEM TESTING FORMS

A. Air-Cooled Chiller

Equipment Tag: _____		Building: _____		Tested By: _____				
Air-Cooled Chiller Point-to-Point Test		Site: _____		Date: _____				
BINARY OUTPUTS								
DESCRIPTION	POINT NAME	FAIL STATE	ON/OPEN	OFF/CLOSED	PASS/FAIL	INITIALS	DATE	NOTES
Chiller 1 S/S		OFF						
Chiller 2 S/S		OFF						
Chilled Water Pump 1 S/S		OFF						
Chilled Water Pump 2 S/S		OFF						
CHW Pump-3 VFD S/S		OFF						
CHILLER-1 COMPRESSOR-1		OFF						
CHILLER-1 COMPRESSOR-2		OFF						
CHILLER-2 COMPRESSOR-1		OFF						
CHILLER-2 COMPRESSOR-2		OFF						
BINARY INPUTS								
DESCRIPTION	POINT NAME	AS FOUND	ON/OPEN	OFF/CLOSED	PASS/FAIL	INITIALS	DATE	NOTES
Chiller 1 Status								
Chiller 2 Status								
CHW Pump-1 Status								
CHW Pump-2 Status								
CHW Pump-3 VFD Status								

Equipment Tag: _____

Building: _____

Tested By: _____

Air-Cooled Chiller Point-to-Point Test

Site: _____

Date: _____

BINARY OUTPUTS

DESCRIPTION	POINT NAME	FAIL STATE	ON/OPEN	OFF/CLOSED	PASS/FAIL	INITIALS	DATE	NOTES
Chiller 1 S/S		OFF						
Chiller 2 S/S		OFF						
Chilled Water Pump 1 S/S		OFF						
Chilled Water Pump 2 S/S		OFF						
CHW Pump-3 VFD S/S		OFF						
CHILLER-1 COMPRESSOR-1		OFF						
CHILLER-1 COMPRESSOR-2		OFF						
CHILLER-2 COMPRESSOR-1		OFF						
CHILLER-2 COMPRESSOR-2		OFF						

BINARY INPUTS

DESCRIPTION	POINT NAME	AS FOUND	ON/OPEN	OFF/CLOSED	PASS/FAIL	INITIALS	DATE	NOTES
Chiller 1 Status								
Chiller 2 Status								
CHW Pump-1 Status								
CHW Pump-2 Status								
CHW Pump-3 VFD Status								

Equipment Tag: _____

Building: _____

Tested By: _____

Air-Cooled Chiller Functional Test

Site: _____

Date: _____

AIR-COOLED CHILLER CHILLED WATER SETPOINT AND STAGING CONTROL				VALUE	PASS/FAIL	INITIALS	DATE	NOTES
Ensure chiller and chilled water pump(s) are running and ready for test								
Record the chiller control setpoints								
Chiller #1 enable setpoints								
Chiller #1 disable setpoints								
Chiller #2 enable setpoints								
Chiller #2 disable setpoints								
Chilled Water Supply Setpoint								
Record existing chilled water supply and return temperatures								
Chilled water supply temperature								
Chilled water return temperature								
Offset from CHW supply temperature setpoint								
Simulate the condition where the chilled water temperature is below setpoint								
Increase chilled water supply setpoint by 5 °F								
Wait as needed to observe the following								
Chiller's compressor(s) stage off								
Chiller(s) and condenser fan(s) stage off								
CHW supply temperature increase to new setpoint								
Chiller(s) maintain new setpoint								

Equipment Tag: _____

Building: _____

Tested By: _____

Air-Cooled Chiller Functional Test

Site: _____

Date: _____

AIR-COOLED CHILLER CHILLED WATER SETPOINT AND STAGING CONTROL				VALUE	PASS/FAIL	INITIALS	DATE	NOTES
Simulate the condition where the chilled water temperature is above setpoint								
Decrease chilled water supply setpoint by 5°F								
<i>Wait as needed to observe the following</i>								
Chiller(s) and condenser fan(s) stage on								
Chiller's compressor(s) stage on								
CHW supply temperature decreases to new setpoint								
Chiller(s) maintain new setpoint								
Restore original setpoints and remove any overrides								
All setpoints are restored to original values								
All overrides are released								

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Equipment Tag: _____	Building: _____	Tested By: _____
ACCU Point-to-Point Test	Site: _____	Date: _____

BINARY OUTPUTS								
DESCRIPTION	POINT NAME	FAIL STATE	ON/OPEN	OFF/CLOSED	PASS/FAIL	INITIALS	DATE	NOTES
Condensing unit S/S		OFF						
		OFF						

BINARY INPUTS								
DESCRIPTION	POINT NAME	FAIL STATE	ON/OPEN	OFF/CLOSED	PASS/FAIL	INITIALS	DATE	NOTES
ACCU status		OFF						

ANALOG OUTPUTS								
DESCRIPTION	POINT NAME	0% CMD	50% CMD	100% CMD	PASS/FAIL	INITIALS	DATE	NOTES

ANALOG INPUTS								
DESCRIPTION	POINT NAME	BAS VALUE	MEASURED	CALIBRATE	PASS/FAIL	INITIALS	DATE	NOTES
Space temp								
OA temp								
SA temp								

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Equipment Tag: _____ Building: _____ Tested By: _____

ACCU Functional Test Site: _____ Date: _____

AIR-COOLED CONDENSING UNIT SETPOINT AND STAGING CONTROL	VALUE	PASS/FAIL	NOTES
Ensure ACCU is running and ready for test			
Record the control setpoints			
ACCU enable setpoint			
ACCU disable setpoint			
Record operation			
Adjust space thermostat to call for cooling			
ACCU compressor and fan start			
When thermostat is satisfied, solenoid closes and compressor pumps down, then stops			
If multiple condensing fans, note staging based on head pressure or ambient temperature			
If supply air temperature control in place, record staging of compressors, operation of refrigerant valves, and temperature control differentials for maintaining setpoint			
Restore original setpoints and remove any overrides			
All setpoints are restored to original values			
All overrides are released			

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ACCU Point-to-Point Test Site: _____ Date: _____

BINARY OUTPUTS

DESCRIPTION	POINT NAME	FAIL STATE	ON/OPEN	OFF/CLOSED	PASS/FAIL	INITIALS	DATE	NOTES
Condensing unit S/S		OFF						
		OFF						

BINARY INPUTS

[illegible]

ANALOG OUTPUTS

[illegible]

ANALOG INPUTS

[illegible]

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Equipment Tag: _____ Building: _____ Tested By: _____

ACCU Functional Test Site: _____ Date: _____

AIR-COOLED CONDENSING UNIT SETPOINT AND STAGING CONTROL	VALUE	PASS/FAIL	NOTES
Ensure ACCU is running and ready for test			
Record the control setpoints			
ACCU enable setpoint			
ACCU disable setpoint			
Record operation			
Adjust space thermostat to call for cooling			
ACCU compressor and fan start			
When thermostat is satisfied, solenoid closes and compressor pumps down, then stops			
If multiple condensing fans, note staging based on head pressure or ambient temperature			
If supply air temperature control in place, record staging of compressors, operation of refrigerant valves, and temperature control differentials for maintaining setpoint			
Restore original setpoints and remove any overrides			
All setpoints are restored to original values			
All overrides are released			

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C. Air Distribution

Equipment Tag: _____		Bldg: _____		Tested By: _____			
Air Distribution Point-to-Point Test		Room: _____		Date: _____			
BINARY OUTPUTS							
DESCRIPTION	POINT NAME	FAIL STATE	AS FOUND	ON/OPEN	OFF/CLOSED	PASS/FAIL	NOTES
Supply Fan S/S		OFF					
Return/Exhaust Fan S/S		OFF					
Isolation Damper O/C		Closed					
BINARY INPUTS							
DESCRIPTION	POINT NAME	AS FOUND		ON/OPEN	OFF/CLOSED	PASS/FAIL	NOTES
Supply Fan Status							
Return/Exhaust Fan Status							
ANALOG OUTPUTS							
DESCRIPTION	POINT NAME	AS FOUND	0% CMD	50% CMD	100% CMD	PASS/FAIL	NOTES
SF VFD Command							
R/EF VFD Command							
Face and Bypass Damper Position							
Economizer Damper Position (100% = OA open, RA closed)							
Zone damper position							
Reheat valve ____ position							
Reheat valve ____ position							

Equipment Tag: _____		Bldg: _____		Tested By: _____			
Air Distribution Point-to-Point Test		Room: _____		Date: _____			
ANALOG INPUTS							
DESCRIPTION	POINT NAME	BAS VALUE	MEASURED	UNITS	CALIBRATION	PASS/FAIL	NOTES
RA temperature				°F			
MA temperature				°F			
SA temperature				°F			
Space temperature				°F			
Reheat Coil DA Temp				°F			
Airflow (VAV)				CFM			
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Equipment Tag: _____		Bldg: _____	Tested By: _____			
Air Distribution Functional Test		Room: _____	Date: _____			
Branch Duct / Area Description	Duct Size	Velocity, fpm	CFM (calculated)	Design CFM	PASS/FAIL	NOTES
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D. Air Handling Unit (AHU)

Equipment Tag: _____		Bldg: _____		Tested By: _____					
Air Handling Unit Point-to-Point Test		Room: _____		Date: _____					
BINARY OUTPUTS									
DESCRIPTION	POINT NAME	FAIL STATE	ON/OPEN	OFF/CLOSED	PASS/FAIL	INITIALS	DATE	NOTES	
Supply Fan S/S		OFF							
Return Fan S/S		OFF							
Isolation Damper Open/Close		Closed							
Heat Recovery Coil or Wheel S/S		OFF							
BINARY INPUTS									
DESCRIPTION	POINT NAME	FAIL STATE	ON/OPEN	OFF/CLOSED	PASS/FAIL	INITIALS	DATE	NOTES	
Supply Fan Status		OFF							
Return Fan Status		OFF							
Heat Recovery Motor Status		OFF							
ANALOG OUTPUTS									
DESCRIPTION	POINT NAME	FAIL STATE	0% CMD	50% CMD	100% CMD	PASS/FAIL	INITIALS	DATE	NOTES
SF VFD Command		0%							
RF VFD Command		0%							
Face and Bypass Damper Position		0%							
Outside Air Damper Position		0%							
Return Air Damper Position		100%							
HW Valve Position		0%							
CHW Valve Position		0%							
Preheat valve position		0%							

Equipment Tag: _____		Bldg: _____		Tested By: _____							
Air Handling Unit Point-to-Point Test		Room: _____		Date: _____							
ANALOG INPUTS											
DESCRIPTION	POINT NAME	BAS VALUE	MEASURED	UNITS	TOLERANCE	ERROR	CALIBRATION	PASS/FAIL	INITIALS	DATE	NOTES
Preheat Temperature				°F							
Discharge Air Temperature				°F							
Return Air Temperature				°F							
Mixed Air Temperature				°F							
Supply Fan Speed				%							
Return Fan Speed				%							
Outside Air Temperature				°F							
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Equipment Tag: _____		Bldg: _____	Tested By: _____	
Air Handling Unit Functional Test		Room: _____	Date: _____	

HEATING CONTROL		VALUE	PASS/FAIL	INITIALS	DATE	NOTES
Record the heating control setpoints						
<input type="checkbox"/>	Economizer lockout setpoint					
<input type="checkbox"/>	Economizer disable setpoint					
<input type="checkbox"/>	Heating lockout setpoint					
<input type="checkbox"/>	Heat Recovery Enable Setpoint					
<input type="checkbox"/>	Heating OAT lockout					
<input type="checkbox"/>	DAT					
<input type="checkbox"/>	Supply Fan is running					
<input type="checkbox"/>	Return Fan is running					
<input type="checkbox"/>	Cooling remains disabled during entire heating control test					
Step 1: Simulate the conditions where there is no call for heating						
<input type="checkbox"/>	OA and EA dampers are at the minimum outside airflow position					
<input type="checkbox"/>	RA dampers are at 100%					
<input type="checkbox"/>	HW heating valves are closed					
Step 2: Simulate a call for heating						
<input type="checkbox"/>	OA and EA dampers are at the minimum outside airflow position; RA damper is at 100%					
<input type="checkbox"/>	Heating valve modulates to maintain temperature setpoint					
Release all system overrides						
<input type="checkbox"/>	All overrides are released					

COOLING CONTROL		Econ. Control	VALUE	PASS/FAIL	INITIALS	DATE	NOTES
Record the cooling control setpoints							
<input type="checkbox"/>	Economizer lockout setpoint	OAT					
<input type="checkbox"/>	Mechanical cooling lockout setpoint(s)						
<input type="checkbox"/>	Heat Recovery Enable Setpoint						
<input type="checkbox"/>	Mechanical Cooling OAT lockout						
<input type="checkbox"/>	DAT						
<input type="checkbox"/>	Supply Fan is running						
<input type="checkbox"/>	Return Fan is running						
<input type="checkbox"/>	Heating remains disabled (valve closed or electric element off) during test						

Equipment Tag: _____		Bldg: _____	Tested By: _____	
Air Handling Unit Functional Test		Room: _____	Date: _____	

COOLING CONTROL, cont'd		VALUE	PASS/FAIL	INITIALS	DATE	NOTES
Step 1: Simulate the conditions where there is no call for cooling						
<input type="checkbox"/>	OA and EA dampers are at the minimum outside airflow position					
<input type="checkbox"/>	RA dampers are at 100%					
<input type="checkbox"/>	HW Heating valve is closed					
<input type="checkbox"/>	Mechanical Cooling remains disabled					
Step 2: Simulate a call for cooling - economizer is enabled and mechanical cooling is disabled						
<input type="checkbox"/>	OA/RA/EA dampers modulate to maintain the DAT setpoint					
<input type="checkbox"/>	Mechanical Cooling remains disabled					
Step 3: Simulate a call for cooling - economizer and mechanical cooling are enabled						
<input type="checkbox"/>	OA/RA/EA dampers modulate to maintain the DAT setpoint					
<input type="checkbox"/>	When OA and EA dampers are 100% open, mechanical cooling is enabled					
<input type="checkbox"/>	DX cooling cycles or CHW valve opens to maintain DAT setpoint					
Step 4: Simulate a call for cooling - economizer is disabled and mechanical cooling is enabled						
<input type="checkbox"/>	OA and EA dampers are at the minimum outside airflow position					
<input type="checkbox"/>	RA dampers are at 100%					
<input type="checkbox"/>	DX compressors cycle or CHW valve opens to maintain DAT setpoint					
Release all system overrides						
<input type="checkbox"/>	All overrides are released					

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Equipment Tag: _____		Bldg: _____	Tested By: _____				
Air Handling Unit Functional Test		Room: _____	Date: _____				
DISCHARGE AIR TEMPERATURE CONTROL			VALUE	PASS/FAIL	INITIALS	DATE	NOTES
Record the Reset Setpoints							
Current Return Air Temperature							
Current Discharge Air Temperature							
Discharge Air Setpoint Source <input type="checkbox"/> Fixed <input type="checkbox"/> OA temp <input type="checkbox"/> RA temp <input type="checkbox"/> Maximum zone cooling demand <input type="checkbox"/> Minimum zone reheat demand							
DA Setpoint High Limit							
DA Setpoint Low Limit							
Calculated DA Setpoint			Calc Check =				
Source High Adjust							
Source Low Adjust							
Adjust the Reset Source High and Low Adjust Values							
New DISCH HI-ADJUST Value							
New DISCH LO-ADJUST Value							
Record New CALCULATED DISCH SETPT							
CALCULATED DISCH SETPT			Calc Check =				
OA/RA/EA dampers modulate to maintain the DAT setpoint							
DX compressors cycle or CHW valve opens to maintain DAT setpoint							
Release all system overrides							
All overrides are released							
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Equipment Tag: _____		Bldg: _____	Tested By: _____				
Air Handling Unit Functional Testing		Room: _____	Date: _____				
FAN SPEED CONTROL			VALUE	PASS/FAIL	INITIALS	DATE	NOTES
Record the duct static pressure control setpoints							
Duct static pressure setpoint							
Override the duct static pressure setpoint to 80% of original value							
Supply fan VFD decreases speed and modulates to maintain the duct static pressure setpoint							
Override the duct static pressure setpoint to 120% of original value							
Supply fan VFD increases speed and modulates to maintain the duct static pressure setpoint							
Return/Exhaust Fan Speed Control <input type="checkbox"/> Tracks Supply Fan Speed <input type="checkbox"/> Return duct pressure <input type="checkbox"/> Building Pressurization							
If tracking supply fan speed, enter offset between supply and return fan speed							
If tracking, does return fan increase and decrease speed in tandem with supply fan speed?							
If based on return duct or building pressure, reduce setpoint to 80% of original value							
Return fan VFD decreases speed and modulates to maintain the pressure setpoint							
If based on return duct or building pressure, increase setpoint to 120% of original value							
Return fan VFD increases speed and modulates to maintain the pressure setpoint							
Release all system overrides							
All overrides are released							
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E. Biosafety Cabinet (BSC)

[illegible]

F. Boiler Plant

[illegible]

Equipment Tag: _____

Building: _____

Tested By: _____

Boiler Point-to-Point Test

Site: _____

Date: _____

ANALOG INPUTS

DESCRIPTION	POINT NAME	BAS VALUE	MEASURED	UNITS	CALIBRATION	PASS/FAIL	INITIALS	DATE	NOTES
Primary HWS Temp				°F					
Hot Water Return Temp				°F					
Secondary HWS Temp				°F					
Outside Air Temperature				°F					

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Equipment Tag: _____

Building: _____

Tested By: _____

Boiler Functional Test

Site: _____

Date: _____

BOILER SETPOINT AND STAGING CONTROL

	VALUE	PASS/FAIL	INITIALS	DATE	NOTES
Ensure boiler and hot water pump(s) are running and ready for test					
Record the boiler control setpoints					
Boiler #1 enable setpoints					
Boiler #1 disable setpoints					
Boiler #2 enable setpoints					
Boiler #2 disable setpoints					
Hot Water Supply Setpoint					
Record existing Hot water supply and return temperatures					
Hot water supply temperature					
Hot water return temperature					
Offset from HW supply temperature setpoint					
Switch HW Pump Lead/Lag Status					
Wait as needed to observe the following					
Lead HW pump stops					
Lag HW pump starts					
Simulate the condition where the Hot water temperature is below setpoint					
Increase Hot water supply setpoint by 15°F					
Wait as needed to observe the following					
Boiler's burner(s) stage on or modulate to high fire					
HW supply temperature increase to new setpoint					
Boiler(s) maintain new setpoint					

Equipment Tag: _____

Building: _____

Tested By: _____

Boiler Functional Test

Site: _____

Date: _____

BOILER SETPOINT AND STAGING CONTROL, cont'd	VALUE	PASS/FAIL	INITIALS	DATE	NOTES
Simulate the condition where the Hot water temperature is above setpoint					
Decrease Hot water supply setpoint by 15°F					
Wait as needed to observe the following					
Boiler burner(s) stage off					
HW supply temperature decreases to new setpoint					
Boiler(s) maintain new setpoint					
Restore original setpoints and remove any overrides					
All setpoints are restored to original values					
All overrides are released					

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G. Chilled Water Plant

Equipment Tag: _____

Building: _____

Tested By: _____

CHW Plant Point-to-Point Test

Site: _____

Date: _____

BINARY OUTPUTS								
DESCRIPTION	POINT NAME	FAIL STATE	ON/OPEN	OFF/CLOSED	PASS/FAIL	INITIALS	DATE	NOTES
Chiller 1 S/S		OFF						
Chiller 2 S/S		OFF						
Chilled Water Pump 1 S/S		OFF						
Chilled Water Pump 2 S/S		OFF						
CHW Pump-3 VFD S/S		OFF						
CT 1 S/S		OFF						
CT 2 S/S		OFF						
CW pump 1 S/S		OFF						
CW pump 2 S/S		OFF						

BINARY INPUTS								
DESCRIPTION	POINT NAME	AS FOUND	ON/OPEN	OFF/CLOSED	PASS/FAIL	INITIALS	DATE	NOTES
Chiller 1 Status								
Chiller 2 Status								
CHW Pump-1 Status								
CHW Pump-2 Status								
CHW Pump-3 VFD Status								
CW pump 1 status								
CW pump 2 status								

Equipment Tag: _____

Building: _____

Tested By: _____

CHW Plant Point-to-Point Test

Site: _____

Date: _____

ANALOG OUTPUTS

DESCRIPTION	POINT NAME	0% CMD	50% CMD	100% CMD	PASS/FAIL	INITIALS	DATE	NOTES
CHW Pump-3 VFD Speed								
CT fans VFD speed								
Remote CHW Setpoint Signal								

ANALOG INPUTS

DESCRIPTION	POINT NAME	BAS VALUE	MEASURED	CALIBRATION	PASS/FAIL	INITIALS	DATE	NOTES
CW supply temp								
CW return temp								
CH-1 supply temp								
CH-2 supply temp								
CHW loop supply temp								
CHW loop return temp								
CHW pump 3 VFD speed								
CT 1 fan VFD speed								
CT 2 fan VFD speed								

Equipment Tag: _____

Building: _____

Tested By: _____

CHW Plant Functional Test

Site: _____

Date: _____

CHILLED WATER SETPOINT AND STAGING CONTROL	VALUE	PASS/FAIL	NOTES
Ensure chiller and chilled water pump(s) are running and ready for test			
Record the chiller control setpoints			
Chiller #1 enable setpoints			
Chiller #1 disable setpoints			
Chiller #2 enable setpoints			
Chiller #2 disable setpoints			
Chilled Water Supply Setpoint			
Record existing chilled water supply and return temperatures			
Chilled water supply temperature			
Chilled water return temperature			
Offset from chilled water supply temperature setpoint			
Simulate the condition where the chilled water temperature is below setpoint			
Increase chilled water supply setpoint by 5°F			
<i>Wait as needed to observe the following</i>			
Chilled water supply temperature increase to new setpoint			
Chiller(s) and condenser fan(s) stage off			
Chiller's compressor(s) stage off			
Chiller(s) maintain new setpoint			
Simulate the condition where the chilled water temperature is above setpoint			
Decrease chilled water supply setpoint by 5°F			
<i>Wait as needed to observe the following</i>			
Chilled water supply temperature decreases to new setpoint			
Chiller(s) and condenser fan(s) stage on			
Chiller's compressor(s) stage on			
Chiller(s) maintain new setpoint			

Equipment Tag: _____

Building: _____

Tested By: _____

CHW Plant Functional Test

Site: _____

Date: _____

CHILLED WATER SETPOINT AND STAGING CONTROL, CONT'D	VALUE	PASS/FAIL	NOTES
Simulate the condition where the chilled water setpoint is reset			
Increase maximum chilled water valve position to 95%			
<i>Wait as needed to observe the following</i>			
Chilled water setpoint decreases			
Decrease all chilled water valve positions to 25%			
<i>Wait as needed to observe the following</i>			
Chilled water setpoint increases			
Restore original setpoints and remove any overrides			
All setpoints are restored to original values			
All overrides are released			

CONDENSER WATER SETPOINT AND STAGING CONTROL	VALUE	PASS/FAIL	NOTES
Ensure condenser water pump(s) are running and ready for test			
Record the cooling tower fan control setpoints			
CT fan #1 enable setpoints			
CT fan #1 disable setpoints			
CT fan #2 enable setpoints			
CT fan #2 disable setpoints			
Condenser Water Supply Setpoint			
Record existing Condenser water supply and return temperatures			
Condenser water supply temperature			
Condenser water return temperature			
Offset from Condenser water supply temperature setpoint			

Equipment Tag: _____

Building: _____

Tested By: _____

CHW Plant Functional Test

Site: _____

Date: _____

CONDENSER WATER SETPOINT AND STAGING CONTROL, CONT'D	VALUE	PASS/FAIL	NOTES
Simulate the condition where the Condenser water temperature is below setpoint			
Increase Condenser water supply setpoint by 5°F			
<i>Wait as needed to observe the following</i>			
Condenser water supply temperature increase to new setpoint			
CT fan(s) drop to minimum speed			
CT fan(s) stage off			
CT fan(s) maintain new setpoint			
Simulate the condition where the Condenser water temperature is above setpoint			
Decrease Condenser water supply setpoint by 5°F			
<i>Wait as needed to observe the following</i>			
Condenser water supply temperature decreases to new setpoint			
CT fan(s) speed up			
CT fan(s) stage on			
CT fan(s) maintain new setpoint			
Simulate the condition where the Condenser water setpoint is reset			
Increase wet bulb temperature to 5 deg above current actual			
<i>Wait as needed to observe the following</i>			
Condenser water setpoint increases			
Decrease wet bulb temperature to 5 deg below current actual			
<i>Wait as needed to observe the following</i>			
Condenser water setpoint decreases			
Restore original setpoints and remove any overrides			
All setpoints are restored to original values			
All overrides are released			

H. Fan-Coil Unit (FCU)

Equipment Tag: _____		Bldg: _____		Tested By: _____	
Fan-coil Unit Point-to-Point Testing		Room: _____		Date: _____	

BINARY OUTPUTS						
DESCRIPTION	POINT NAME	FAIL STATE	ON/OPEN	OFF/CLOSED	PASS/FAIL	NOTES
Supply Fan S/S		OFF				
Isolation Damper Open/Close		Closed				
		OFF				

BINARY INPUTS						
DESCRIPTION	POINT NAME	FAIL STATE	ON/OPEN	OFF/CLOSED	PASS/FAIL	NOTES
Supply Fan Status		OFF				

ANALOG OUTPUTS							
DESCRIPTION	POINT NAME	FAIL STATE	0% CMD	50% CMD	100% CMD	PASS/FAIL	NOTES
Outside Air Damper Position		0%					
Return Air Damper Position		100%					
HW Valve Position		0%					
CHW Valve Position		0%					

ANALOG INPUTS									
DESCRIPTION	POINT NAME	BAS VALUE	MEASURED	UNITS	TOLERANCE	ERROR	CALIBRATION	PASS/FAIL	NOTES
Discharge Air Temperature				°F					
Return Air Temperature				°F					
Mixed Air Temperature				°F					
Space Temperature				°F					

Equipment Tag: _____		Bldg: _____		Tested By: _____	
Fan-coil Unit Functional Test		Room: _____		Date: _____	

HEATING CONTROL			VALUE	PASS/FAIL	NOTES
Record the heating control setpoints					
<input type="checkbox"/>	Heating OAT lockout				
<input type="checkbox"/>	DAT				
<input type="checkbox"/>	Supply Fan is running				
<input type="checkbox"/>	Cooling remains disabled during entire heating control test				
Step 1: Simulate the conditions where there is no call for heating					
<input type="checkbox"/>	OA and EA dampers are at the minimum outside airflow position				
<input type="checkbox"/>	RA dampers are at 100%				
<input type="checkbox"/>	HW heating valves are closed				
Step 2: Simulate a call for heating					
<input type="checkbox"/>	OA and EA dampers are at the minimum outside airflow position; RA damper is at 100%				
<input type="checkbox"/>	Heating valve modulates to maintain temperature setpoint				
Release all system overrides					
<input type="checkbox"/>	All overrides are released				

COOLING CONTROL			VALUE	PASS/FAIL	NOTES
Record the cooling control setpoints					
<input type="checkbox"/>	Mechanical Cooling OAT lockout				
<input type="checkbox"/>	DAT				
<input type="checkbox"/>	Supply Fan is running				
<input type="checkbox"/>	Heating remains disabled (valve closed or electric element off) during test				
Economizer control type: <input type="checkbox"/> no economizer <input type="checkbox"/> fixed DB <input type="checkbox"/> Fixed Enthalpy <input type="checkbox"/> Differential temp <input type="checkbox"/> Differential enthalpy					

Equipment Tag: _____		Bldg: _____	Tested By: _____	
Fan-coil Unit Functional Test, cont'd		Room: _____	Date: _____	
COOLING CONTROL, cont'd		VALUE	PASS/FAIL	NOTES
Step 1: Simulate the conditions where there is no call for cooling				
	OA and EA dampers are at the minimum outside airflow position			
	RA dampers are at 100%			
	HW Heating valve is closed			
	Mechanical Cooling remains disabled			
Step 2: Simulate a call for cooling - economizer is enabled and mechanical cooling is disabled				
	OA/RA/EA dampers modulate to maintain the DAT setpoint			
	Mechanical Cooling remains disabled			
Step 3: Simulate a call for cooling - economizer and mechanical cooling are enabled				
	OA/RA/EA dampers modulate to maintain the DAT setpoint			
	When OA and EA dampers are 100% open, mechanical cooling is enabled			
	DX cooling cycles or CHW valve opens to maintain DAT setpoint			
Step 4: Simulate a call for cooling - economizer is disabled and mechanical cooling is enabled				
	OA and EA dampers are at the minimum outside airflow position			
	RA dampers are at 100%			
	DX compressors cycle or CHW valve opens to maintain DAT setpoint			
Release all system overrides				
	All overrides are released			

[illegible]

Equipment Tag: _____

Building: _____

Tested By: _____

Hot Water Converter Point-to-Point Test

Site: _____

Date: _____

ANALOG INPUTS

DESCRIPTION	POINT NAME	BAS VALUE	MEASURED	UNITS	CALIBRATION	PASS/FAIL	INITIALS	DATE	NOTES
HX1 HW Supply Temp				°F					
HX1 HW Return Temp				°F					
HX2 HW Supply Temp				°F					
HX2 HW Return Temp				°F					
Outside Air Temperature				°F					

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Equipment Tag: _____

Building: _____

Tested By: _____

Hot Water Converter Functional Test

Site: _____

Date: _____

HOT WATER SETPOINT CONTROL		VALUE	PASS/FAIL	INITIALS	DATE	NOTES
Ensure steam supply and hot water pump(s) are running and ready for test						
Record the converter control setpoints						
Heat Exchanger 2 HWS setpoint						
Heat Exchanger 1 HWS setpoint						
Record existing Hot water supply and return temperatures						
Hot water supply temperature						
Hot water return temperature						
Difference from HW supply temperature setpoint						
Switch HW Pump Lead/Lag Status						
Wait as needed to observe the following						
Lead HW pump stops						
Lag HW pump starts						
Simulate the condition where the Hot water temperature is below setpoint						
Increase Hot water supply setpoint by 15°F						
Wait as needed to observe the following						
Steam valve(s) modulate open						
HW supply temperature increase to new setpoint						
Valve(s) maintain new setpoint						
Simulate the condition where the Hot water temperature is above setpoint						
Decrease Hot water supply setpoint by 15°F						
Wait as needed to observe the following						
Steam valve(s) modulate closed						
HW supply temperature decreases to new setpoint						
Valve(s) maintain new setpoint						

Equipment Tag: _____

Building: _____

Tested By: _____

Hot Water Converter Functional Test

Site: _____

Date: _____

HOT WATER SETPOINT CONTROL, cont'd		VALUE	PASS/FAIL	INITIALS	DATE	NOTES
Restore original setpoints and remove any overrides						
All setpoints are restored to original values						
All overrides are released						

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[illegible]

[illegible]

L. Un-insulated Pipe Inventory

Location Description: _____		Bldg: _____	Tested By: _____	
Uninsulated Pipe/Fitting Inventory		Room: _____	Date: _____	

Piping with damaged or missing insulation	Surface Temp	NPT, in.	Lin. Ft.	pipe content	room temp	Note Ref. #s
Segment 1						
Segment 2						
Segment 3						
Segment 4						
Segment 5						
Segment 6						
Segment 7						
Segment 8						
Segment 9						
Segment 10						

Uninsulated valves, fittings	Surface Temp	NPT, in.	Valve Type	pipe content	room temp	Note Ref. #s

Location Description: _____		Bldg: _____	Tested By: _____	
Uninsulated Pipe/Fitting Inventory		Room: _____	Date: _____	

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M. Unitary Temperature Control

Equipment Tag: _____		Bldg: _____			Tested By: _____	
Unitary Equipment Temperature Control Point-to-Point Test		Room: _____		Date: _____		

BINARY OUTPUTS						
DESCRIPTION	POINT NAME	FAIL STATE	ON/OPEN	OFF/CLOSED	PASS/FAIL	NOTE
Fan S/S		OFF				
Isolation Damper Open/Closed		Closed				
Valve Open/Closed		Closed				

BINARY INPUTS						
DESCRIPTION	POINT NAME	FAIL STATE	ON/OPEN	OFF/CLOSED	PASS/FAIL	NOTE
Fan Status		OFF				

ANALOG OUTPUTS							
DESCRIPTION	POINT NAME	FAIL STATE	0% CMD	50% CMD	100% CMD	PASS/FAIL	NOTE
Hot Water/Steam Valve		0%					
CHW Valve		0%					

ANALOG INPUTS									
DESCRIPTION	POINT NAME	BAS VALUE	MEASURED	UNITS	TOLERANCE	ERROR	CALIBRATION	PASS/FAIL	NOTE
RA temperature				°F					
SA temperature				°F					
Space temperature				°F					

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Equipment Tag: _____		Bldg: _____	Tested By: _____
Unitary Equipment Temperature Control Functional Test		Room: _____	Date: _____

Temperature	VALUE	PASS/FAIL	NOTE
Note initial heating/cooling temperature setpoints	/		
Note initial temperature reading			
Adjust setpoint to 2 deg below current space temperature, then wait as needed to observe the following:			
Heating stops			
Cooling (if present) starts			
Adjust setpoint to 2 deg above current space temperature, then wait as needed to observe the following:			
Cooling (if present) stops			
Heating starts			
If separate controls for heating and cooling equipment, note setpoints H/C	/		
Adjust separate thermostats so heating setpoint is above space temperature and cooling setpoint is below space temperature, to force			
Heating and cooling both start? (Y/N)			
Lockout function present <input type="checkbox"/> Lockout in controller program <input type="checkbox"/> Lockout via electrical interlock <input type="checkbox"/>			
Restore original setpoints and remove any overrides			

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