

**SOM FACILITIES START-UP AND COMMISSIONING CHECK LIST FOR ELECTRICAL EQUIPMENT**

Building:	Project Name:	
Date:	Name:	

**SWITCHGEAR AND SWITCHBOARD ASSEMBLIES**

ITEM	DESCRIPTION	STATUS		COMMENTS
1	Visual and Mechanical Inspection			
a	Equipment nameplate data shall be documented.	P	F	_____
b	Verify the presence of all the manufacturers intended Documentation	P	F	_____
c	Inspect physical, electrical, and mechanical condition of switchboard/switchgear and all components	P	F	_____ _____
d	Confirm correct application of lubricants	P	F	_____
e	Verify that fuse and/or circuit breaker sizes and types correspond to drawings.	P	F	_____ _____
f	Verify drawings for correct revision and date	P	F	_____
g	Verify that current and potential transformer ratios correspond to drawings.	P	F	_____ _____
h	Verify tightness of accessible bolted electrical connectins by calibrated froque-wrench	P	F	_____ _____
i	Confirm correct operation and sequencing of electrical and mechanical interlock systems.	P	F	_____ _____
j	Verify correct barrier and shutter installation and operation	P	F	_____
k	Inspect all mechanical indicating devices for correct operation	P	F	_____
l	Verify that filters are in place and/or vents are clear	P	F	_____
m	Test operation, alignment, and penetration of instrument transformer withdrawal disconnects			_____

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ITEM	DESCRIPTION	STATUS		COMMENTS
1	Visual and Mechanical Inspection (continued)			
n	Mainswitchboards provided with Campus Utilities Department approved SCADA enabled meters with test/isolation switches	P	F	_____ _____
o	Short Circuit, Coordination, and Arc Flash Studies included and	P	F	_____

	and provided by engineer or equipment supplier		
p	Panelboards: door-in-door construction, copper bus, fully bussed for 42 spaces.	P	F
q	Switchboards and Switchgear include 25% spare bussed space	P	F
r	Ground fault provided on feeders as well as main for critical facilities	P	F
s	Key Interlock Schemes included permanently printed instructions	P	F
t	3rd party testing included per NETA standards	P	F
u	Test individual circuit breakers larger than 400A. Test all insulated case circuit breakers	P	F
v	Adequate lighting at unit substations and electrical rooms	P	F
w	Some lighting in main electrical room on emergency lighting	P	F
x	Outdoor lighting on photo control with manual bypass in electrical room. No time switches	P	F
y	Panel labeling, Emergency panel labels "red", Arc Flash labeling	P	F
z	Panels marked with Voltage and amps	P	F
aa	Work clearances maintained: 30" min width at panelboard, 36" deep for 208V, 42" deep for 480V	P	F
bb	Panelboard keys provided	P	F

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1	Visual and Mechanical Inspection (continued)			
cc	Adjustable circuit breaker trip units set per coordination study, not left at minimum, tested, and labeled.	P	F	
dd	Switchboards, Switchgear, & Panelboards left clean and dust free including insulators	P	F	
ee	Spare fuses in wall mounted box for fused gear	P	F	
ff	Spare conduits to ceiling space for flush panels	P	F	
gg	Panels include neutral and ground busses with no bonding of neutral to ground	P	F	
hh	Key Interlock Schemes tested and instructions printed on equip	P	F	
ii	Damaged paint repaired with correct color	P	F	

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ITEM	DESCRIPTION	STATUS	COMMENTS
2	Electrical Tests		
a	Perform insulation-resistance tests on each bus section, phase-to-phase and phase-to-ground	P F	_____
b	Perform secondary current injection tests on the entire current circuit in each section	P F	_____
c	Perform control wiring performance test	P F	_____
d	Determine accuracy of all (analog) meters	P F	_____
e	Perform phasing check on double-ended switchgear to insure correct bus phasing from each source	P F	_____
f	Verify correct function of control transfer relays located in switchgear with multiple power sources.	P F	_____
g	Verify operation of switchgear/switchboard heaters.	P F	_____
h	Contractor physically operated all circuit breakers larger than 225A during turnover	P F	_____
3	Optional Tests		
a	Perform tests on all instrument transformers	P F	_____
b	Perform insulation-resistance tests at 1000 Vdc on all control wiring	P F	_____

c	Perform ground-resistance tests	P	F	
d	Perform a power frequency test (High Pot) on each bus section, each phase to ground	P	F	
e	Perform current tests by primary injection	P	F	

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3	Optional Tests (continued)																		
e	Perform current tests by primary injection	P	F																
f	Perform electrical performance test on control power transformer circuits	P	F																
g	Perform electrical performance tests on potential transformer circuits	P	F																
4	Test Value																		
a	Bolt torque levels are checked in accordance with manufacturer's specifications	P	F																
b	Insulation resistance testing is to be performed in accordance with the following guidelines 250 V 500 Vdc 6000 V 1000 Vdc 5000 V 2500 Vdc 39000 V 5000 Vdc	P	F																
c	Overpotential testing will not proceed until insulation resistance testing is completed	P	F																
d	Overpotential test voltages are applied in accordance with the following guidelines	P	F																
	<table border="1"> <thead> <tr> <th>Test Voltage kV</th> <th>Rated k Vac</th> <th>dc</th> </tr> </thead> <tbody> <tr> <td>5</td> <td>14.3</td> <td>20.2</td> </tr> <tr> <td>15</td> <td>27.0</td> <td>37.5</td> </tr> <tr> <td>25</td> <td>45.0</td> <td>+</td> </tr> <tr> <td>31</td> <td>60.0</td> <td>+</td> </tr> </tbody> </table>	Test Voltage kV	Rated k Vac	dc	5	14.3	20.2	15	27.0	37.5	25	45.0	+	31	60.0	+			
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5	14.3	20.2																	
15	27.0	37.5																	
25	45.0	+																	
31	60.0	+																	
	Final test voltages will be applied for one (1) minute																		
	* Derived from ANSI/IEEE C37.20.2 and C37.20.3																		
	+ Consult manufacturer																		