

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

| | | |
|-----------|---------------|--|
| Building: | Project Name: | |
| Date: | Name: | |

VARIABLE FREQUENCY DRIVES

| ITEM | DESCRIPTION | STATUS | | COMMENTS |
|------|---|--------|---|----------|
| 1 | Visual and Mechanical Inspection | | | |
| a | Document equipment nameplate data | P | F | |
| b | Verify equipment nameplate ratings are in accordance with the owner's drawings and specifications | P | F | |
| c | Inspect physical, electrical, and mechanical conditions | P | F | |
| d | Confirm correct application of lubricants at manufacturer's recommended locations. | P | F | |
| e | Verify appropriate anchorage, required area clearances, physical damage, and correct alignment and clearances | P | F | |
| f | Verify that fuse and/or circuit breaker sizes and types correspond to drawings. | P | F | |
| g | Verify that current and potential transformer ratios correspond to drawings. | P | F | |
| h | Verify tightness of accessible bolted electrical connections by calibrated torque wrench method. | P | F | |
| i | Confirm correct operation and sequencing of electrical and mechanical interlock systems. | P | F | |
| j | Attempt closure on locked-open devices. Attempt to open locked-closed devices. | P | F | |
| k | Make key exchange with devices operated in off-normal positions | P | F | |

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| 1 | Visual and Mechanical Inspection (continued) | | | |
| l | Inspect insulators for evidence of physical damage or | P | F | |

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| | contaminated surfaces. | | | |
| m | Verify correct barrier and shutter installation and operation | P | F | |
| n | Exercise all active components | P | F | |
| o | Verify that filters are in place and/or vents are clean | P | F | |
| p | Test operation, alignment, and penetration of instrument transformer withdrawl disconnects, current carrying & grounding | P | F | |
| q | Inspect control power transformers. | P | F | |
| r | Inspect physical damage, cracked insulation, broken leads, tightness of connections, defective wiring and overall general conditions | P | F | |
| s | Verify that primary and secondary fuse ratings or circuit breakers match drawings | P | F | |
| t | Verify MCC is located in a clean accessible area on housekeeping pad. Pad includes 42" standing space in front of MCC | P | F | |
| u | Verify that there are no modules on the top row so that to top row does not exceed code height. | P | F | |
| v | Verify standard construction, copper bus, NEMA Class II, Type B. All modules draw out | P | F | |
| w | Verify that the MCC is protected by magneic Motor Circuit Protectors (MCP), not circuit breakers. | P | F | |
| x | Verify that the Variable Frequency Drives are near motor not in MCC | P | F | |

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| 1 | Visual and Mechanical Inspection (continued) | | | |
| y | Verify that there are 4 sets of Auxiliary contacts | P | F | |
| z | Verify opeation of the Hand-Off-Auto selector switches for fans Verify Off-Auto switch only for pumps that cannot run dry. | P | F | |
| aa | Confirm LED pilot lamps: Red "Run" only | P | F | |
| bb | Verify Control Transformers in each module, fused primary and secondary | P | F | |

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| cc | Verify seismic rating, CBC Zone 4 | P | F | |
| dd | Verify adequate lighting, Emergency lighting if available | P | F | |
| ee | Include 25% spare sections | P | F | |
| ff | Verify Arc Flash Hazard labels are applied | P | F | |
| gg | Verify panels are marked with Voltage & Amperage | P | F | |
| hh | Verify working clearances maintained: 30" min or full width of MCC, 36" deep for 208V, 42" deep for 480V. | P | F | |
| ii | Verify MCC is clean and dust free including insulators | P | F | |
| jj | Damaged paint repaired with correct color | P | F | |
| kk | Panel labels consistent with drawings. Emergency labels "red" | P | F | |

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|------|--|--------|---|----------|
| 2 | Electrical Tests | | | |
| a | Perform insulation-resistance tests on each bus section, phase-to-phase and phase-to-ground at the min dc test voltage | P | F | |
| b | Perform test on all instrument transformers | P | F | |
| c | Verify operation of motor control center heaters | P | F | |
| d | Determine accuracy of all meters. | P | F | |
| e | Test individual circuit breakers larger than 400A | P | F | |
| 3 | Optional Tests | | | |
| a | Perform insulation-resistance test at 500 Vdc on all control wiring except on wiring connected to solid-state components | P | F | |

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| b | Perform tests on all instrument transformers | P | F | _____ |
| c | Perform the following tests on control power transformers: | P | F | _____ |
| | Perform insulation-resistance test | | | |
| | Perform secondary wiring integrity test | | | |
| | Verify correct secondary voltage by energizing primary winding with system voltage. | | | |
| d | Perform the following tests on potential transformers: | P | F | _____ |
| | Perform secondary wiring integrity test | | | |
| | Verify secondary voltage by energizing primary winding with system voltage. | | | _____ |
| e | Perform a power frequency test (High Pot) on each bus section, each phase-to-ground with phases not under test grounded. | P | F | _____ |
| | | P | F | _____ |
| f | Perform ground-resistance tests | P | F | _____ |