

## Facility Restart Assessment

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|----------|--|------------------------------------|
| <b>1</b> | <b>Clean &amp; decontaminate entire facility</b>   |                                    |
| <b>2</b> | <b>Physically arrange facilities to comply with social distancing requirements</b>   |                                    |
|          |  | Common areas                       |
|          |  | Reception areas                    |
|          |  | Break rooms                        |
|          |  | Conference rooms                   |
|          |  | Locker rooms                       |
|          |  | Lavatories                         |
|          |  | Elevators                          |
| <b>3</b> | <b>Verify incoming utilities:</b>  |                                    |
|          |  | Electrical power quality           |
|          |  | Voltage, current, frequency        |
|          |  | Harmonics                          |
|          |  | Surges and sags                    |
|          |  | Interruptions                      |
|          |  | City Water                         |
|          |  | Natural Gas                        |
| <b>4</b> | <b>Clean, inspect, repair &amp; service facilities equipment that has been idled and measure performance to measurable standards:</b>          |                                    |
|          | Electrical distribution equipment including switchgear, transformers & motor control centers & enclosure cooling/pressurization systems (dust) |                                    |
|          |  | Clean internally – dust, corrosion |
|          |  | Filters & fans                     |
|          |  | Knife switch/linkages              |
|          |  | Indicator lamps & alarms           |
|          |  | Transformer oil analysis           |
|          |  | Surge arresting systems            |
|          |  | Thermographic & ultrasound scans   |
|          | Verify and test integrity of all electrical system grounds.  |                                    |

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|  | IT systems/server rooms                     |
|  | Inspect & test UPS functionality            |
|  | Clean and inspect climate control systems   |
|  | Emergency lighting systems                  |
|  | Battery condition                           |
|  | Sensor test                                 |
|  | Replace burnt out lighting                  |
|  | Inspect all illuminated exit signage        |
|  | Interior lighting                           |
|  | Photoswitches & sensors                     |
|  | Replace burnt out bulbs/ballasts            |
|  | Exterior lighting                           |
|  | Photoswitches & sensors                     |
|  | Timers                                      |
|  | Replace burnt out bulbs/ballasts            |
|  | Standby power generation systems            |
|  | Transfer switch function                    |
|  | Filters                                     |
|  | Fluids                                      |
|  | Batteries                                   |
|  | Ventilation/exhaust                         |
|  | Natural gas and/or fuel systems             |
|  | Clean and inspect storage devices and tanks |
|  | Inspect for leaks                           |
|  | Inspect transfer pumps (oil)                |
|  | Verify system pressures & flows             |
|  | Replace any filter elements (oil)           |
|  | Water supply/systems                        |
|  | Inspect for leaks                           |
|  | Exercise main valves                        |

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| HVAC control systems                        |  |
|   | Standby/operating mode correct   |
|   | Alarms   |
|   | Test all VAVs and control devices. Drain any residual moisture from all pneumatic control lines.   |
|   | Test VAV and damper control solenoids.   |
| Ductwork, ventilators, blowers & fans       |  |
|   | Flowhood test for correct air volume   |
|   | Leakage – ultrasound, smoke tests  |
|   | Dust/debris buildup  |
|   | Animal/bird ingress  |
|   | Mechanical power transmission checks (motors, bearings & belt drives) for fans & blowers including fan balance, thermographic & ultrasound surveys. Inspect drive belts for signs of cracking or wear. |
|   | Fan/blower isolators – impacted springs or cracked isolators   |
|   | Perform internal and external inspections of all air handlers and cooling/heating coils  |
|   | Cycle all dampers and inspect for wear and/or damage.  |
| Air filtration units                        |  |
|   | Filter condition   |
|   | Differential pressures & flows   |
|   | Bypassing & leakage (ultrasound or smoke checks)   |
| Wall & room unit heaters & air conditioners |  |
|   | Temperature & flow   |
|   | Filter condition   |
| Combustion systems for heating              |  |
|   | Clean all orifices & vents   |
|   | Clean ignition systems   |
|   | Differential pressure check across all devices   |
|   | Functional check of all safeties   |
|   | Combustible gas analysis check including CO, SOx & NOx   |

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| Boilers                          |   |
|                                  | Clean.  |
|                                  | Inspect & test for leaks.   |
|                                  | Combustion system clean & inspect   |
|                                  | Analyze combustion gas  |
|                                  | Inspect fire tubes  |
|                                  | Inspect drums   |
|                                  | Verify steam trap function using thermography and ultrasound  |
|                                  | Inspect condensate return system & pumps  |
|                                  | Functionally test all safeties, including relief and reducing valves  |
|                                  | Drain & refill  |
|                                  | Verify makeup water system function   |
|                                  | Inspect & test water treatment systems.   |
| Cooling towers                   |   |
|                                  | Clean & refill sump   |
|                                  | Clean strainers   |
|                                  | Inspect & clean packing condition   |
|                                  | Verify water chemistry & functionally check water treatment systems   |
|                                  | Fan volume check & balance  |
|                                  | Pumps: Flow check, leak & seal check, thermographic & ultrasound scan   |
|                                  | Motors: Clean, inspect wiring & termination box seals, perform thermographic & ultrasound scan, dynamic motor analysis if critical, verify amperage |
|                                  | Nozzles & distribution boxes  |
|                                  | Verify correct differential pressure & temperature  |
|                                  | Thoroughly clean radiant elements for all dry-type coolers  |
| Chillers & chilled water systems |   |
|                                  | Verify proper refrigerant charge  |
|                                  | Inspect, test & top off compressor oil.   |
|                                  | Clean/charge water side of loop   |
|                                  | Verify water pressure, flow & temperature – feed and return   |
|                                  | Verify refrigerant pressures and temperatures at compressor, evaporator & condenser– suction and discharge  |

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| Air compressors, dryers (refrigerant & dessicant) & air receiver tanks |   |
|  | Verify compressor oil levels  |
|  | Inspect & change oil separator filter elements  |
|  | Clean radiator or heat exchanger  |
|  | Verify refrigerant pressures and temperatures at compressor, evaporator & condenser in refrigerant air dryers |
|  | Inspect condition of dessicant in dessicant air dryers  |
|  | Functionally test tower purge & charge controls in dessicant air dryers, including humidity sensors & timers  |
|  | Drain all condensate filters. Consider cleaning or replacing filter elements that have been idled.            |
|  | Drain, clean & change airline drip lubricators.   |
|  | Open drip legs and air receiver tank discharges to remove moisture and condensate.                            |
|  | Perform ultrasound & thermographic scans of compressors, dryers and their associated motors.                  |
|  | Perform an ultrasound scan of all compressed air piping, especially flexible plastic or rubber air lines.     |
| Plumbing & piping systems, including drainage systems                  |   |
|  | Inspect and test all systems for leaks.   |
|  | Fill all traps in sinks, toilets, floor drains.   |
|  | Clear debris from around all floor drains and catch basins  |
|  | Clean and functional test all hot water heaters.  |
|  | Verify that all vent stacks are clear and leak free.  |
|  | Perform combustion gas analysis for all water heaters.  |
| Fire detection & suppression (sprinkler) systems                       |   |
|  | Perform system test of all elements   |
|  | Exercise valves   |

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| Building infrastructure: Roofing, windows, walls, doors, flooring            |   |
|  | Inspect for leaks and signs of water damage   |
|  | Inspect for physical damage   |
|  | Walk all roof surfaces and inspect for damage and/or wear. Inspect access and hatchways.                  |
|  | Inspect for tightness   |
|  | Infrared scan roofs, doors & windows  |
|  | Inspect for mold/mildew   |
|  | Inspect all interior and exterior signage   |
|  | Inspect and verify integrity of fire escapes, ladders & security devices for same                         |
|  | Verify that all drains and rain leaders are cleared and leak free   |
|  | Inspect all emergency exits to insure that crash bars and alarms are functional and not blocked.          |
|  | Inspect all walking and working surfaces, platforms and mezzanines for physical and/or structural damage. |
| Building infrastructure, continued: Roofing, windows, walls, doors, flooring |   |
|  | Inspect all stairways and elevators.  |
|  | Inspect all handrails.  |
|  | Inspect and test all fire doors.  |
| Kitchen/Cafeteria/Food Preparation areas                                     |   |
|  | Clean and inspect all equipment   |
|  | Test and all food preparation equipment.  |
|  | Clean all surfaces and storage areas.   |
|  | Test and service all sanitation equipment/systems   |
| Insect & rodent control  |   |
|  | Schedule pest control service to inspect and/or service all traps and controls                            |
| Security systems & gates   |   |
|  | Clean and inspect for wear and damage   |
|  | Lubricate all moving elements   |
|  | Inspect drives.   |
|  | Functional test all security systems  |
|  | Inspect all systems for alarms.   |

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|   | Exterior personnel & overhead doors   |   |
|   |   | Clean and inspect for wear and damage   |
|   |   | Lubricate all moving elements   |
|   |   | Inspect drives.   |
|   |   | Inspect all locking and latching mechanisms                                     |
|   |   | Inspect door seals/dock bumpers for tightness.                                  |
|   | Dock levelers & locks   |   |
|   |   | Clean and inspect.  |
|   |   | Lubricate all moving elements   |
|   |   | Inspect & test hydraulic systems – especially fluid levels, condition and leaks |
|   |   | Test all safety devices.  |
|   | Parking lots & grounds  |   |
|   |   | Thoroughly clean and sweep.   |
|   |   | Inspect parking and driving surfaces and curbs                                  |
|   |   | Inspect all barriers, stops & signage   |
|   |   | Clean and clear all catch basins and storm drains.                              |
| 5 | <b>Perform functional tests, system by system. Think of performing these in this prioritized order: Power, controls, interlocks and end effectors (motors, fans, dampers, VAVs, etc.). Catching a failure in the power source of a system may eliminate a host of apparent downstream failures.</b> |   |
| 6 | <b>Document operating parameters of all equipment and systems as a benchmark.</b>   |   |