

COOLING TOWERS - INDUCED DRAFT

1. INTRODUCTION

This sample pre-functional checklist is for hypothetical induced draft cooling towers.

2. APPLICATION

Checklist items are to be completed as part of installation, start-up, and initial quality control inspection. This checklist does not take the place of the manufacturer's recommended checkout and start-up procedures or reports.

Line items shall be complete and shall be checked off only by parties having direct knowledge of that line item being completed.

Inapplicable line items shall be identified as such by:

- "N/A" for non-applicable line items.
- "BO" for line items by others.

Contractors assigned responsibility for checklist line items shall be responsible for those line items, even if line item is sub-contracted.

Identify line item status by:

- Indicating line item is complete by checking respective box.
- Indicating line item is incomplete by recording a remark number in respective box and providing associated comment below table.

"Contr." column or abbreviations in brackets to the right of an item identifies responsible contractor.

3. APPROVALS

Contractor signature signifies equipment identified herein and systems integral to them are complete and ready for functional performance testing with the exception of consequential items.

_____	_____	_____
(General Contractor Signature)	(Company)	(Date)
_____	_____	_____
(Mechanical Contractor Signature)	(Company)	(Date)
_____	_____	_____
(Controls Contractor Signature)	(Company)	(Date)
_____	_____	_____
(Test & Balance Contractor Signature)	(Company)	(Date)
_____	_____	_____
(Electrical Contractor Signature)	(Company)	(Date)

4. CHECK-OFF ITEMS

CHECKED ITEM	EQUIPMENT IDENTIFICATION										CONTR.
<b>General Installation</b>											
Permanent equipment label has been affixed.											
Cooling tower installation has been completed and has been verified to be in good condition.											
Site is sufficiently clean for testing.											
Fan belts have been adjusted.											
Fan shaft collars have been installed and are tight.											
Fan has been lubricated.											
Propeller fan blade pitches have been adjusted.											
Tower basin access is in place.											
Tower basin sump strainers have been cleaned.											
Tower sump has been filled.											
Sump heater and all freeze protection measures (alarms, tape, etc.) are in place.											
Spray water inlet strainer has been installed and has been cleaned.											
Spray nozzles have been cleaned.											
Seismic anchoring has been installed.											
Multiple cooling towers have been interlocked.											
Chemical treatment system installation has been completed.											
<b>Piping System</b>											
Cooling tower piping, cooling tower piping, and make up water piping installation has been completed.											
Pipe labeling has been completed and flow direction has been indicated.											
Pipe fittings and accessory installation has been completed.											
Valves have been properly tagged.											

CHECKED ITEM	EQUIPMENT IDENTIFICATION										CONTR.
Isolation and balancing valves have been installed.											
Valves have been installed in correct direction.											
Distribution header has been balanced.											
Flow switch(es) has (have) installed.											
Water meter has been installed.											
Temperature and pressure sensors have been installed.											
System flushing has been completed and strainers have been cleaned.											
System has been filled with working fluid.											
Pressure/temperature plugs have been installed at each control sensor and in accordance with drawings.											
Makeup water shut-off valve has been installed.											
Chemical treatment system installation has been completed.											
Pipe insulation installation has been completed.											
Pipes verified to not be supported by tower.											
<b>Electrical and Controls</b>											
Power has been provided to unit and disconnect has been installed.											
All electrical components have been grounded.											
Motor protection and safeties have been installed.											
Power has been provided to sump heater and all freeze protection measures (alarms, tape, etc.).											
Sensors have been calibrated.											
Control system interlocks have been made and have been verified to be functioning properly.											

CHECKED ITEM	EQUIPMENT IDENTIFICATION										CONTR.
All control devices, pneumatic tubing, and wiring installations have been completed.											
Overcurrent heater size has been verified to be correct.											
Motorized valves have been verified to be functioning properly.											
Motor efficiency has been verified.											
<b>Test and Balance</b>											
System and balancing devices have been verified to allow balancing to be completed in accordance with NEBB or AABC procedures.											
<b>Operation</b>											
Safeties have been energized and tested.											
Equipment has been verified to start and operate correctly.											
Equipment has been verified to not produce unusual noise or vibration.											
Fan rotation has been verified to be correct.											
Line-to-line voltage phase imbalance has been verified to be less than 2% according to: %Imbalance = 100 x (avg. - lowest)/avg.). Record actual value below: Actual imbalance (%):											
Full load running amps has been measured. Record measured value below: Actual full load amps:											
Rated full load running amps and service factor have been recorded. Record measured values below: Actual rated full load amps: Actual service factor:											
Hand-Off-Auto switch has been verified to properly activate and deactivate equipment.											

CHECKED ITEM	EQUIPMENT IDENTIFICATION										CONTR.
Belts have been checked and adjusted after at least 24 hours of operation.											
Fan has been verified to stop upon receipt of vibration alarm.											
Building control system has been verified to receive vibration alarm.											
Sump heater proper operation and staging have been verified.											
High and low water alarms have been tested.											
As-built operation sequences and schedules have been completed with all variations documented and submitted to CxC.											
Specified point-to-point checks have been completed and documentation record has been submitted to CxC.											
<b>Final</b>											
Startup report has been submitted to CxC which includes: <ul style="list-style-type: none"> <li>• Manufacturer's written certification that all specified features, controls, and safeties have been installed and are functioning properly.</li> <li>• Manufacturer's written certification that installation and applications comply with manufacturer's recommendations.</li> </ul>											
Chilled water piping, cooling tower piping, and pump construction checklists have been completed and submitted to CxC.											
Water treatment report has been submitted to CxC.											

CHECKED ITEM	EQUIPMENT IDENTIFICATION										CONTR.
Safeties have been installed and safe operating ranges have been submitted to CxC.											
<b>NOTES:</b>											
01											
02											

-- End of Checklist --