

Condenser Water System Point List									
Point Name	AI	AO	DI	DO	Virtual	Network	Sensor Type	Comment	
Condenser pump start-stop				X			Relay	Typical of 2	
Condenser pump proof-of-operation			X				Current-switch	Typical of 2; Note 7	⚠
Cooling tower fan low speed command				X			Relay	Typical of 2; Notes 6, 7	
Cooling tower fan high speed command				X			Relay	Typical of 2; Note 7	
Cooling tower fan low speed proof-of-operation			X				Current-switch	Typical of 2; Note 7	
Cooling tower fan high speed proof-of-operation			X				Current-switch	Typical of 2; Note 7	
Cooling tower make-up flow			X				Meter-pulser	Note 7	
Cooling tower blow-down flow			X				Meter-pulser	Note 7	⚠
Cooling tower TDS level	X						Note 1	Note 7	
Cooling tower pH	X			X			Note 1	Note 7	
Condenser water flow	X						Differential pressure	Note 2, 4, 7	
Condenser water system supply temperature	X						Moneyhell Standard	Note 7	⚠
Condenser water system return temperature	X						Moneyhell Standard	Note 7	
Cooling tower cold basin water temperature	X						Platinum RTD with xmtr.	Typical of 2; Note 7	
Condenser water bypass temperature	X						Platinum RTD with xmtr.	Note 7	
Cooling tower make-up valve command							Warriek	Note 5, 7	⚠
Cooling tower low level alarm							Warriek	Note 7	
Cooling tower high level alarm							Warriek	Note 7	
Cooling tower basin heat control				X			Relay	Typical of 2; Note 3, 7	
Cooling tower basin heat proof-of-operation	X						Current Transformer	Typical of 2; Note 2	
Chiller entering condenser water temperature	X						Moneyhell Standard	Typical of 2; Note 7	⚠
Chiller leaving condenser water temperature	X						Moneyhell Standard	Typical of 2; Note 7	
Chiller condenser temperature					X		Network Point	Typical of 2; Notes 1; 7	⚠
Chiller condenser pressure					X		Network Point	Typical of 2; Notes 1; 7	
Note 1 - Coordinate with the water treatment vendor to pick up a signal from their controller.									
Note 2 - With five valve manifold									
Note 3 - Furnish a load break rated disconnect. The operating team shall manually turn on basin heat as needed.									
Note 4 - Coordinate with Division 15 to match flow transmitter span and requirements.									
Note 5 - Furnish and install Watts heavy duty mechanical float valve or equal, one per cell.									
Note 6 - Provide a start-stop point for the single speed starters associated with the VE study.									
Note 7 - Modified or Deleted, VE Study									

CONDENSER WATER SYSTEM SEQUENCE OF OPERATION

1. The condenser water system shall run as required to support the operation of the chiller plant. The operating team shall have the ability to over-ride the operating schedule as needed.

2. The condenser water plant shall maintain a constant supply water temperature of 85°F under all operating conditions. The operating team shall have the ability to over-ride this set point as needed.

3. The control system shall stage the cooling tower fans and condenser pumps as required to ensure maximum efficiency under all operating conditioins. The operating team shall have the ability to over-ride any piece of equipment's operating parameters as needed.

4. Safety interlocks shall be provided as required by the manufacturer. At a minimum, for the cooling towers, the interlocks shall include a vibration switch.

5. All motor starters shall be provided with motor overloads and meet the requirements of the National Electric Code and shall be provided with Hand-Off-Auto switches. Automated control of the motor by the control system shall occur with the switch in the "Auto" position. The "Hand" position shall allow the operator to over-ride the control system. Regardless of the position of the selector switch, all safety devices shall function.

6. All safety interlocks shall be hard wired. Software based safeties shall not be accepted.

7. Provide trending and trend archiving capabilities only. Trends to be set up as required by the operating team subsequent to construction.

8. Provide high alarm high warning alarm, low warning alarm and low alarm capabilities only. Alarms to be set up as required by the operating team subsequent to construction.

9. The control system shall cycle the basin heat as required to maintain the cooling tower cold basins at 40°F.

10. The control system shall cycle the make-up valve to open it when the basin level is 1 inch above the manufacturer's recommended minimum level and to close when the basin level is 1 inch below the over flow level. The control system shall issue an alarm if the basin level drops to less than the manufacturer's recommended minimum level or rises to with in 1/2 inch of the basin overflow level.

