

# System Diagram Break Out 01

## Given

- The results of our node analysis
- The sequence of operation on the drawings

*1. Answer the questions that follow*

### CHILLER PLANT SEQUENCE OF OPERATION

1. The chiller plant shall run 24/7 to ensure guest satisfaction. The operating team shall have the ability to over-ride the operating schedule as needed.
2. The chilled water plant shall maintain a constant supply water temperature of 42°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 chillers and distribution pumps as required to ensure maximum efficiency under all operating conditoinis. 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 manufactuer. At a minimum, for the chillers, the interlocks shall include a chilled water flow switch and an auxilliary from the associated evaporator pump starter.
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 operationg team subsequent to construcion.
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.



Does the node analysis give you any insight into how the control system programmer might go about “*staging the chillers and distribution pumps as required to ensure maximum efficiency under all operating conditions*”?



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Put together an outline/bullet point sequence for staging the chillers as the plant goes from minimum load to full load based on your understanding of the design intent

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Would there be any benefit to including programming that changed the lead chiller every 1,000 hours in order to ensure equal run time for each machine?