Introduction

BAS point selection is one of the most important aspects of BAS design (the other being the sequence of operation). Yet if two designers developed a point list for the same project there would be many differences. Will both lists work well (that depends on the rigor of the "science" that was applied to the point list selection) and, if so, will the difference be reflected in the quality of the BAS's control (that depends on the "art" behind the point list selection)?

Source: http://automatedbuildings.com/news/aug18/columns/18072-4023303ira.html

Point selection "science":

1. Start with a schematic diagram of the system to be controlled. It could be a sketch or a "one-line" diagram developed for the mechanical design, or even just a mental image.

2. Determine what safeties and/or factory controls come with the equipment. ** Are these safeties/controls required in lieu of using the BAS? Boiler or chiller factory safeties must be used, some factory-provided controls are fine if left in place (e.g., cooling tower sump level controls) while others can make the BAS's execution of the control sequence more difficult (e.g., an OA flow sensor with integral OA damper control). The point list should only include factory-provided safeties if they to be monitored by the BAS or if the factory controls will be integrated to the BAS (via "objects" discussed below).. **3. From the diagram identify each of the system's components to be controlled (e.g., "Supply Fan," "Cooling Coil," "Mixed Air Dampers," etc.).

4. Be mindful of how you want/need to control the system. It may be helpful to develop an outline of the sequence of operation if you can't do this in your head.

5. Start the point list by listing out each component. Look at each component on the schematic and ask yourself what inputs & outputs are needed to control it. All modulating outputs (e.g., AHU coil valve) requires an associated input, motor start/stop outputs should have associated status inputs, etc.

Point Selection "art":

1. Point list development is iterative with that of the sequence (i.e., neither can be considered "complete" until the other is complete and vice versa). When to end the iterations involves judgment based on experience.

2. Decide what functions should be controlled by points vs. "objects" via data communications. The point list needs to clearly differentiate between points (i.e., each connected by dedicated analog-signaling wiring) vs. via digitally communicated objects (i.e., via BACnet). VFD's are a perfect example since they typically come standard with both point connections along with BACnet communications. I believe functions critical to the BAS sequence should be connected via points (e.g., start/stop, speed control, and motor status via a current switch at the motor not via a VFD connection). Other objects are generally not critical to the sequence and can be communicated digitally. Which approach to take with connections for HOA and bypass switches' positions (if needed) depends on how critical these are to the sequence.. **3. It is important that safeties (e.g., freezestats) be directly hard-wired to turn off the associated equipment** (e.g., a motor starter). Wiring a safety via the BAS provides too much opportunity to override its function. However, you can choose to also monitor safeties from the BAS, though knowing which safety has tripped a motor off may not be critical to the BAS sequence.

4. Many other inputs (or objects) can be connected (or communicated) to a BAS for monitoring and/or troubleshooting purposes. For example, I would consider an AHU's MAT to be a useful monitoring/troubleshooting point even if not critical to the sequence (while RAT is usually less useful). The monitoring of equipment energy consumption can be important depending on whether the building owner's needs and goals. Owner input on these "optional" points should be taken into account here..