

## **PART 1 - GENERAL**

### **1.1 SEQUENCES**

- .1 Present sequencing of operations for systems, in accordance with IM 250005 - 2009: Energy Management and Control Systems (EMCS) Design Manual.

### **1.2 GENERAL**

- .1 Following sequences apply for all the mechanical systems, when it is necessary.
- .2 Critical protections or those required by codes (detection of gas, fire, etc.) will not have to be by-passed in any way, neither manually, nor by computer. If an input is required to the centralized system, supply a relay to execute the double function of control and alarm.
- .3 When there is an input of information for proof of operation, a total of hours of operation of mechanical equipments (compressors, water tower, ventilators, pumps, air conditioning devices, etc.) will automatically be made, complete with operator control resetting.
- .4 Program alarms for all the following situations:

- .1 Discrepancy between command and state signals.
- .2 Zero flow or low water shut-off of pumps.

When the program switches control modes (example: cooling with heating), a dead range must be included on set-points. Also, several control stages in sequence contain a minimum time IN and OUT. These measures eliminate the danger of equipment cyclic functioning.

- .5 The following sequences must be read together with drawings and list of points. Supply all the control points necessary for the control sequences performing, listed or implicit.
- .6 Program trend log points for all the input and output analog points and variables that change in the time.
- .7 Unless otherwise specified, alarms will be transfer to following devices when these are a part of planned system in drawings or existing:

| POINTS          | ALARM | OPERATION HOURS | TENDANCE | ALARM DESTINATION | COMMENTS                            |
|-----------------|-------|-----------------|----------|-------------------|-------------------------------------|
| ANALOG INPUTS   | X     |                 | X        | F,P,S             |                                     |
| ANALOG OUTPUTS  | X     |                 | X        | F,P,S             |                                     |
| DIGITAL INPUTS  | X     | X               |          | F,P,S             | Related to the corresponding output |
| DIGITAL OUTPUTS |       | X               |          | F,P,S             |                                     |
| SET-POINTS      | X     |                 | X        | F,P,S             |                                     |
| VARIABLES       | X     |                 |          | F,P,S             |                                     |
| SYSTEM CONTROL  | X     |                 |          | F,P,M             |                                     |

F: File

M: Modem

P: Printer

S: Screen

### 1.3 DOMESTIC WATER FLOWMETER AND PUMPS

- .1 The meter is provided by Division 23. Connect the signal to the control system. Program a point indicating the actual flow. Create a table of hourly, daily, min/max daily, and monthly consumptions for the last 12 months. Record all daily and monthly values in a historical point.
- .2 Under normal conditions, pump #1 or pump #2 will be the leading pump. The pump lead will be changed weekly on Sunday morning at 4:00 AM. If the lead pump fails, the other pump will start and pump #3 shall be the next pump in sequence.
- .3 When the system flow exceeds the capacity of lead pump (120 USGPM), the second pump will be started and will run until the flow is below 100 USGPM, at which point only the lead pump will be running. Pump #3 will be started when flow exceeds 240 USGPM and stopped when flow is below 200 USGPM. Future pump #4 will be started when flow exceeds 740 USGPM and stopped when flow is below 700 USGPM.
- .4 Existing low level switch (LSL102) will shut off all pumps.

## **PART 2 - PRODUCTS**

### 2.1 NOT USED

- .1 Not Used.

**PART 3 - EXECUTION**

**3.1 NOT USED**

.1 Not Used.

**END OF SECTION**

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