



KSU Convocation Center - Atrium Smoke Control Sequence of Operations

DETAILED DESCRIPTION

This logic sequence outlines the response of the atrium smoke control system to a fire alarm event. The system is designed to manage smoke migration and support firefighter operations by controlling the status of fans and make-up air doors.

1. Fire Alarm Event Detection

- a. When a fire alarm event occurs, the system first checks the FSCP (Firefighter's Smoke Control Panel) fan switch status:
 - i. If the switch is in the EXHAUST position, the system proceeds to check if make-up air doors are open.
 - ii. If the switch is in the AUTO position, the system proceeds to assess the type of initiating device:
 - 1.) Area smoke detectors (located at the top of the clerestory),
 - 2.) Fire sprinkler system, or
 - 3.) Manual pull station

2. Door and Window Preparation

- a. Once a valid input is confirmed:
 - i. The system unlocks all make-up air doors.
 - ii. It then opens all make-up air doors to provide a clear path for air entry and pressure relief.
 - iii. The system activates door hold-open mechanisms to ensure they remain in the open position during the event.

3. Initial Fan Shutdown and Position Check

- a. After a 15-second time delay, the system:
 - i. Removes all fan start signals to prevent fans from operating prematurely.
 - ii. It then checks the actual position of all make-up air doors.

4. Door Position Evaluation

- a. If any doors fail to open, the system:
 - i. Illuminates the FSCP Door Failure LED (Red) to notify operators of the issue.
- b. If all doors are confirmed open, the system:
 - i. Turns on the FSCP Door Open LED (Green).
 - ii. Waits for a 5-second time delay, then

- iii. Sends the start signal to the appropriate fan groups, initiating smoke exhaust and air replacement as required.

5. **Post-Event Reset and System Recovery**

- a. Once the smoke control operation is no longer needed—either through manual system reset or if the FSCP fan switch is placed in the OFF position:
 - i. The system removes all fan start signals,
 - ii. The system closes all make-up air doors, and
 - iii. The system removes the door unlock signal
- b. If the fan switch was turned OFF, fan start signals specific to that group are also removed to prevent unintended fan operation.

6. **Troubleshooting**

- a. Confirm BMCP Operation:
 - i. Ensure the BMCP's programming is correct and
 - ii. Ensure the BMCP receives signals from the FACP and the Smoke Control Panel
 - iii. Ensure the BMCP's outputs to Fans/Units is operational.
- b. Confirm Smoke Control Panel Operation
 - i. Ensure the Schneider Electric PLC Controller is communicating with the BMCP
 - ii. Confirm programming is correct
- c. Confirm the Edwards FACP's signal to the BMS is programmed and operational
- d. Check Fire alarm system devices with the atrium are programmed to signal the BCMP
- e. Confirm the FACP's relay connection to the first floor atrium relief doors are operational and programmed correctly

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