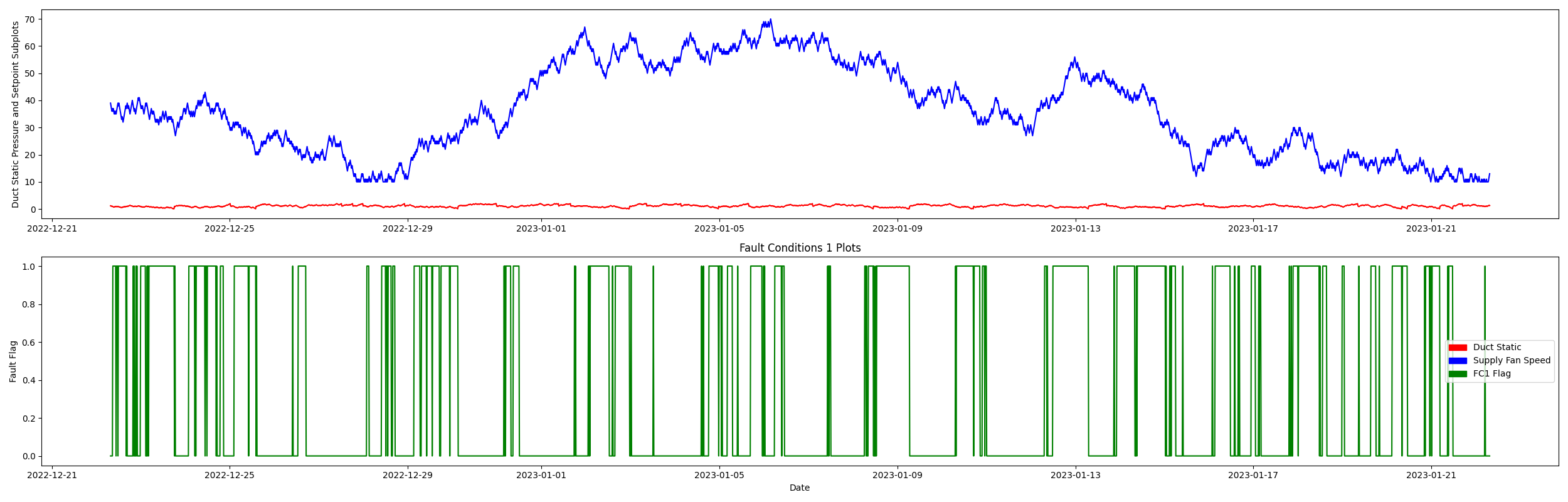
Fault Condition One Report

Fault condition one of ASHRAE Guideline 36 is related to flagging poor performance of a AHU variable supply fan attempting to control to a duct pressure setpoint. Fault condition equation as defined by ASHRAE:



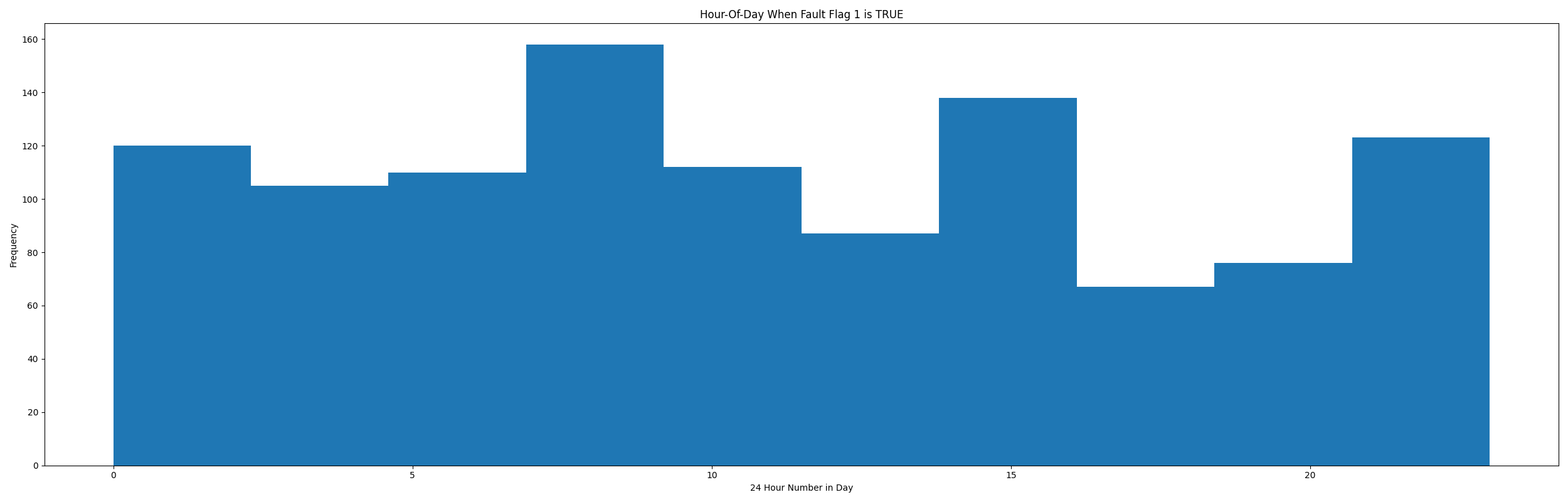
## Dataset Plot



## Dataset Statistics

* Total time calculated in dataset: 30 days 23:45:00
* Total time in hours calculated in dataset: 743.75
* Total time in hours for when FDD flag is True: 10.0
* Percent of time in the dataset when the Fault flag is True: 36.83%
* Percent of time in the dataset when flag is False: 63.17%

## Time-of-day Histogram Plots



* Average duct system pressure for when in fault condition (fan VFD speed > 95%): 0.66"WC

## VFD Speed Statistics

* count 2976.000000  
  mean 35.933132  
  std 16.206915  
  min 10.000000  
  25% 22.000000  
  50% 35.000000  
  75% 51.000000  
  max 70.000000  
  Name: supply\_vfd\_speed, dtype: float64

## Duct Pressure Statistics

* count 2976.000000  
  mean 1.093523  
  std 0.414623  
  min 0.092784  
  25% 0.792784  
  50% 1.092784  
  75% 1.392784  
  max 1.992784  
  Name: duct\_static, dtype: float64

## Duct Pressure Setpoints Statistics

* count 2976.0  
  mean 1.0  
  std 0.0  
  min 1.0  
  25% 1.0  
  50% 1.0  
  75% 1.0  
  max 1.0  
  Name: duct\_static\_setpoint, dtype: float64

## Suggestions based on data analysis

* The percent True of time in the dataset for when the variable fan is running at maximum speed and generating very little duct pressure is very high. This fan system appears to struggle and it could be recommended to further troubleshoot the system with a consulting engineer. A consulting engineer could be hired to redesign ventilation rates for the VAV system which can then be passed to a testing, adjusting, and balancing contractor (TAB) to implement where the TAB contractor would be responsible for any necessary mechanical adjustments for making the fan system operate to design.
* The control programming doesnt appear to have a duct pressure reset strategy implemented as the standard deviation of the duct pressure setpoint data equals zero. It would be recommended to hire a consulting engineer to properly design, oversee, and validate a duct pressure reset strategy implemented by a controls contractor. A duct pressure reset can potentially save fan electrical energy consumption.

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