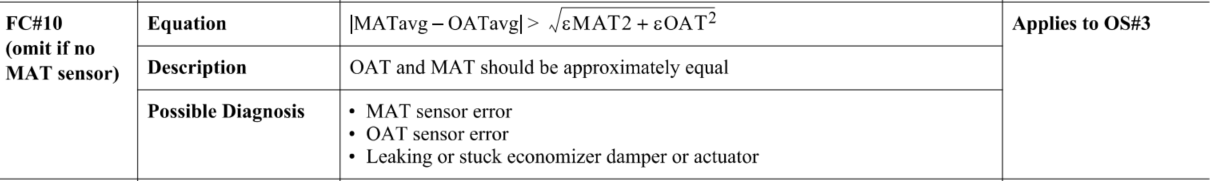
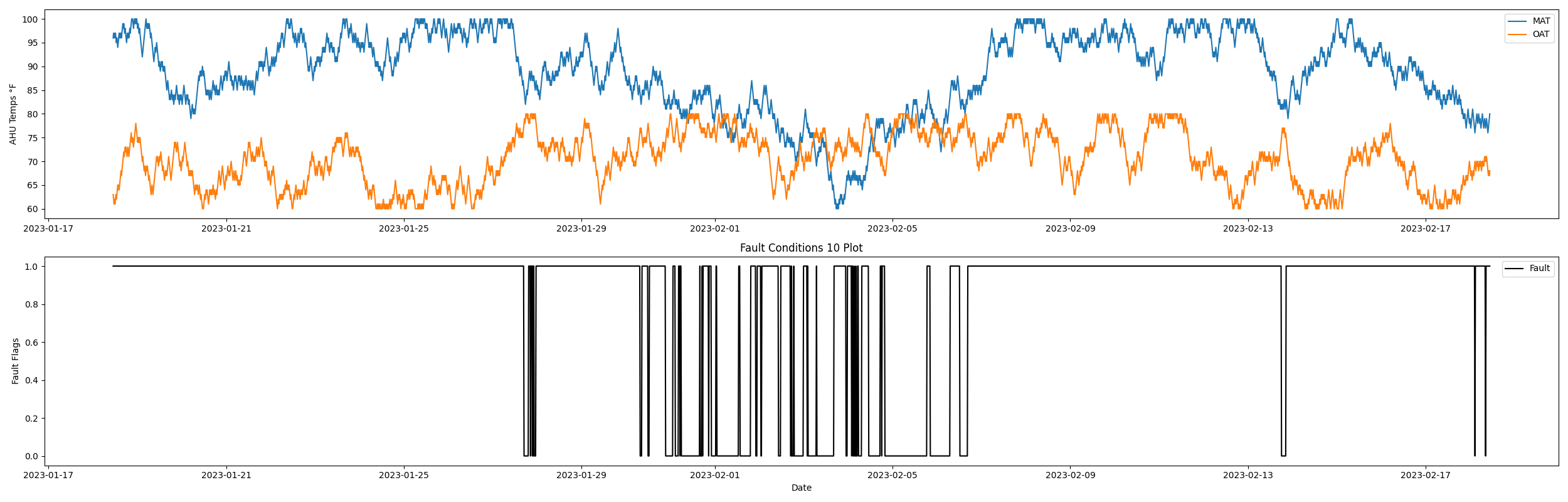
Fault Condition Ten Report

Fault condition ten of ASHRAE Guideline 36 is an AHU economizer + mechanical cooling mode only with an attempt at flagging conditions where the outside air temperature and mixing air temperatures are not approximetely equal when the AHU is in a 100% outside air mode. Fault condition ten equation as defined by ASHRAE:



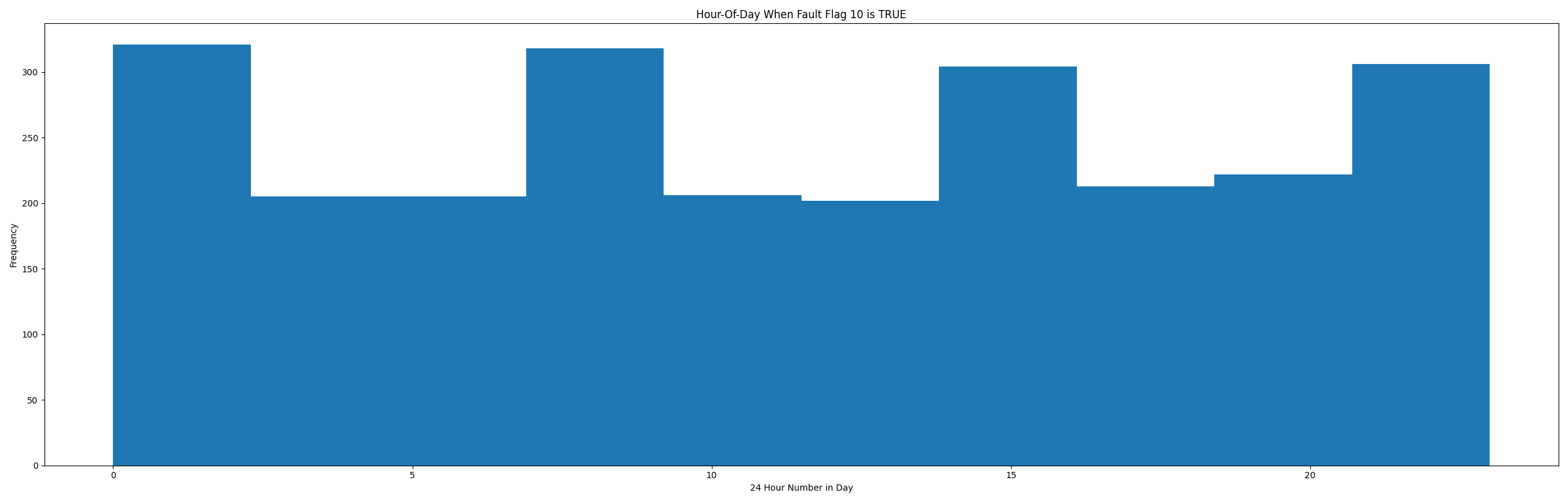
## Dataset Plot



## Dataset Statistics

* Total time in days calculated in dataset: 30.99
* Total time in hours calculated in dataset: 743.75
* Total time in hours for when fault flag is True: 625.25
* Percent of time in the dataset when the fault flag is True: 84.07%
* Percent of time in the dataset when the fault flag is False: 15.93%

## Time-of-day Histogram Plots



* When fault condition 10 is True the average outside air is 69.44 in °F and the mixing air temperature is 90.9 in °F.

## Mixing Air Temp Setpoint Statistics

* count 2976.000000  
  mean 88.800739  
  std 8.429616  
  min 60.000000  
  25% 83.000000  
  50% 90.000000  
  75% 96.000000  
  max 100.000000  
  Name: oat, dtype: float64

## Outside Air Temp Statistics

* count 2976.000000  
  mean 70.436828  
  std 5.541899  
  min 60.000000  
  25% 66.000000  
  50% 71.000000  
  75% 75.000000  
  max 80.000000  
  Name: mat, dtype: float64

## Suggestions based on data analysis

* The percent True metric that represents the amount of time for when the fault flag is True is high indicating temperature sensor error or the mixing air dampers are stuck or broken with the inability for the AHU to go into a proper 100 percent outside air mode. If the outside air temperature is a global variable on the BAS verify (IE, installed to the boiler plant controller and then shared via supervisory level logic on the BAS to the AHU controllers on the BAS network) that where the actual OA temperature is installed that is on the North side of the building in the shade. On the AHU verify mix temperature sensor calibration and that the mixing dampers have good proper rotation with good seals when in the closed position. When testing AHU systems operating in a 100 percent outside air mode it could be worth verifying exhaust systems or return fans are operating properly. In thoery if alot of air is being pumped into the building and it is allowed to be exhaust or relieved properly, a balanced building will not have any issues of closing or opening egress doors to the building due to excess positive building pressure.

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