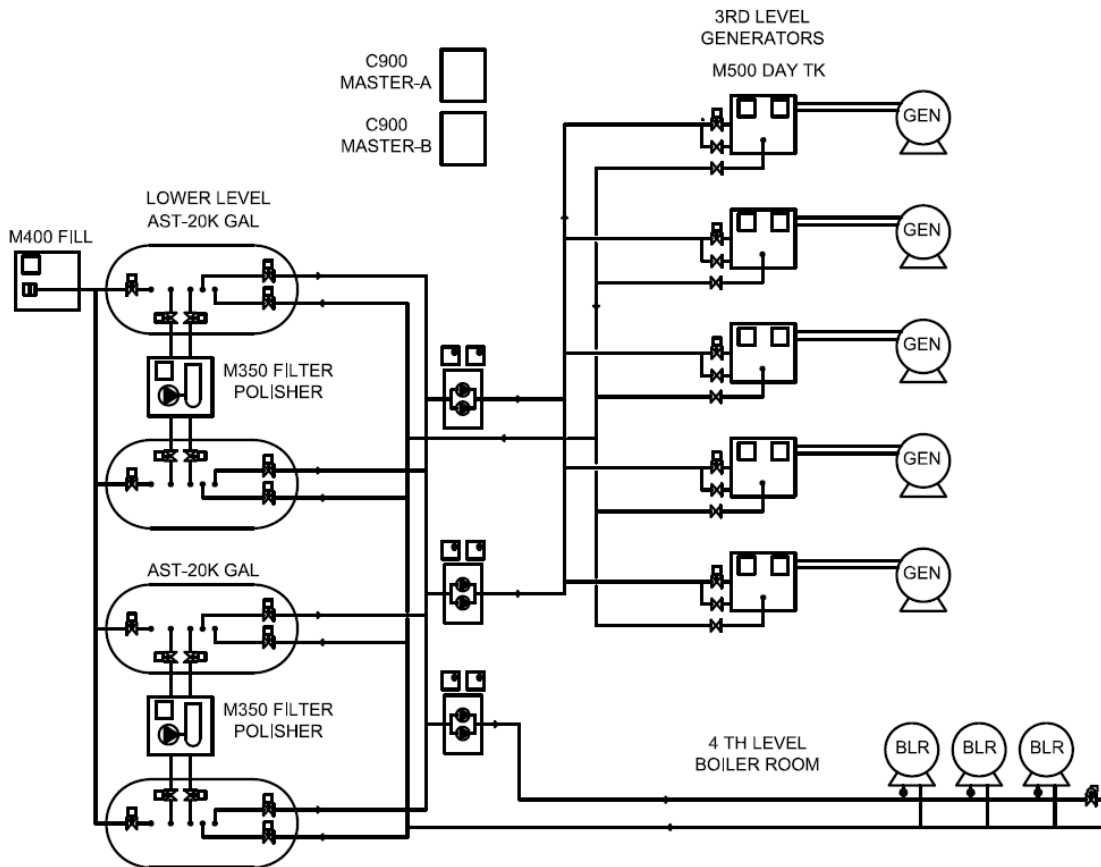


Medical Center Fuel System Design Urban Hi-Rise Rush Medical Center CEP

General Description:

Rush University Medical Center in Chicago required a new Central Energy Plant to support its new 14 story 806,000 SF hospital. The central plant is located in an urban area requiring the location of the bulk storage tanks within the lower level of the building protected within specially constructed rooms. The 6 generators and the boiler plant are located on upper floors and are fed by duplex pump sets at the lower level.



Challenges:

Tank Selection: The total storage requirements were met by installing 4 aboveground tanks of 20,000 gallon capacity. The M400 fill station at grade allows the selection of the tank to be filled while assuring that other tank valves are closed to prevent overfills. Additional actuated valves are provided for the FOS and FOR piping connections at each tank. The master control panels allow the selection of the lead tanks and the operation of the FOS and FOR valves.

Generator Fuel System Capacity Limits: The generators are located on an upper floor of the building. Fire code regulations limited the amount of fuel that could be stored on upper floors, requiring that the generator day tanks be very limited in size. Smaller day tanks can create a problem of heat buildup, so the generator FOR flows directly back to the lower level bulk storage tanks. This means that the pump flow rates must be increased by about 3 times, and that the reliability of the system is critical.

Integration: An additional challenge was the testing and integration of all status points into the facility wide BMS system using Ethernet connectivity and BACnet. The Earthsafe standard integration protocol includes sets of standard monitoring points for each system element, allowing for quick building and testing of points lists.

Operating Sequence Summary:

The system consists of 6 generator day tanks, serviced by 4 aboveground ground bulk storage tanks located in special rooms within the building. There are 2 sets of duplex pumps. Each of The day tanks has a C800 controller with level switches. The C800 controllers integrate with the C900 Master Controllers in the lower level pump rooms.

The boiler fuel system consists of a pair of high pressure positive displacement pumps. The C900 controller on the pump sets respond to a boiler call for fuel. The lead tank actuated valves are opened and the duplex pump sends fuel to the upper floor boiler feed loop.

Special Operating Features:

1. **Filtration Polishers Dual Tank:** Fuel polishers are provided for the bulk tanks to provide weekly filtration of the bulk tank contents. There are 2 filtration units, each of which serves a pair of bulk storage tanks using actuated valves to control the flow paths.