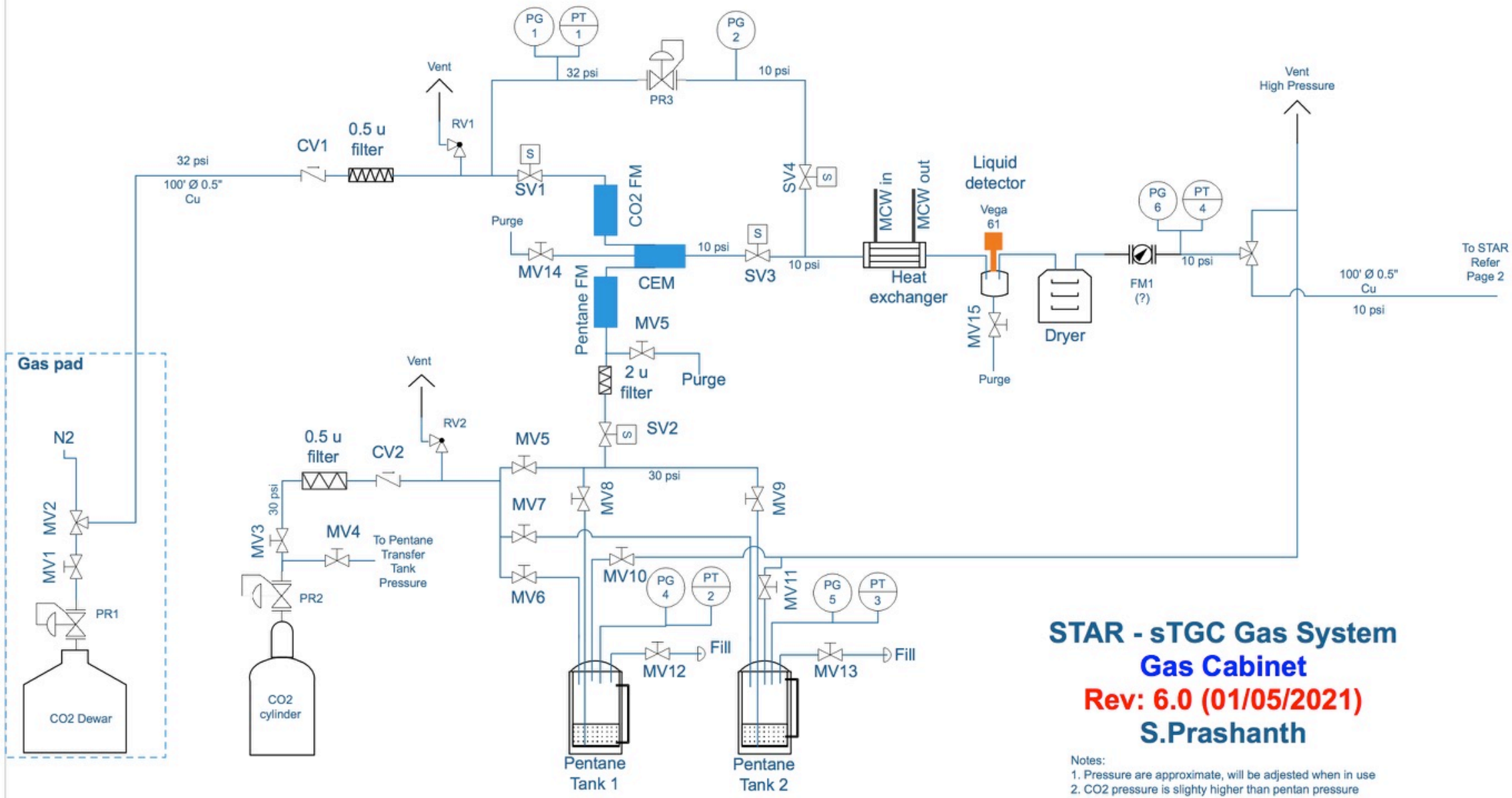


# fSTAR f2f meeting sTGC Gas System and Safety

**S. Prashanth for the BNL Group**

Following slides contains mostly images with latest update

# Gas Mixing System

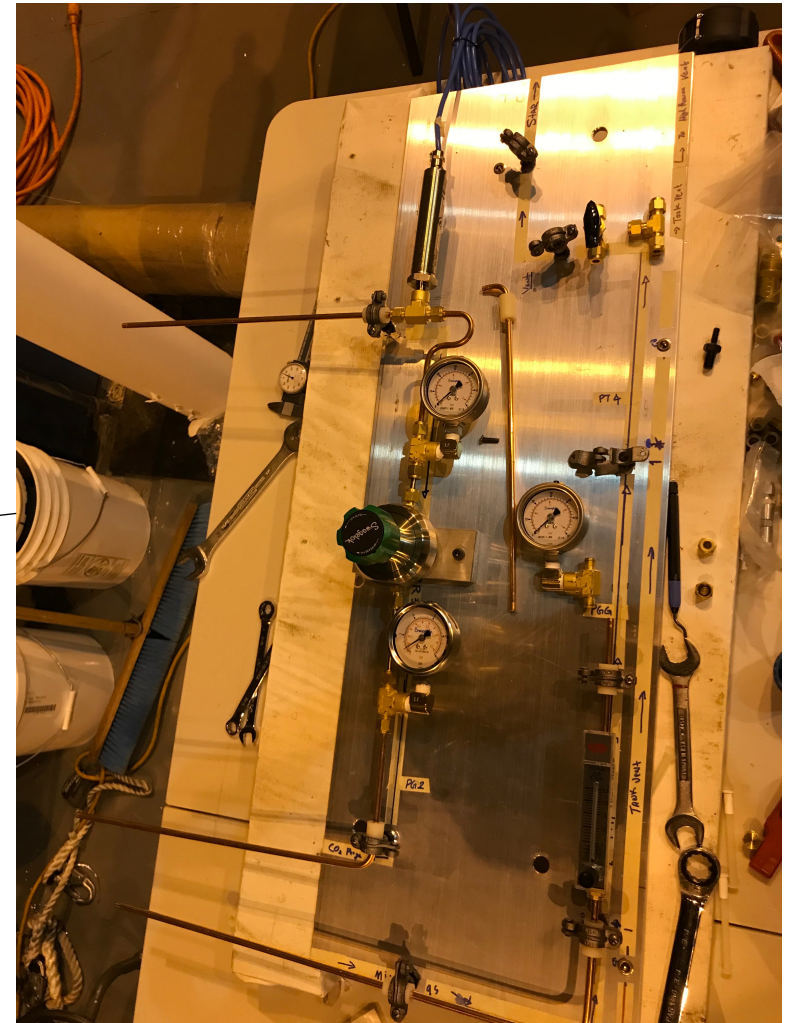


**STAR - sTGC Gas System**  
**Gas Cabinet**  
**Rev: 6.0 (01/05/2021)**  
**S.Prashanth**

- Notes:
- 1. Pressure are approximate, will be adjusted when in use
  - 2. CO2 pressure is slightly higher than pentan pressure
  - 3. Gas lines are 1/4" otherwise noted
  - 4. Dewar/Cylinder valves are not shown



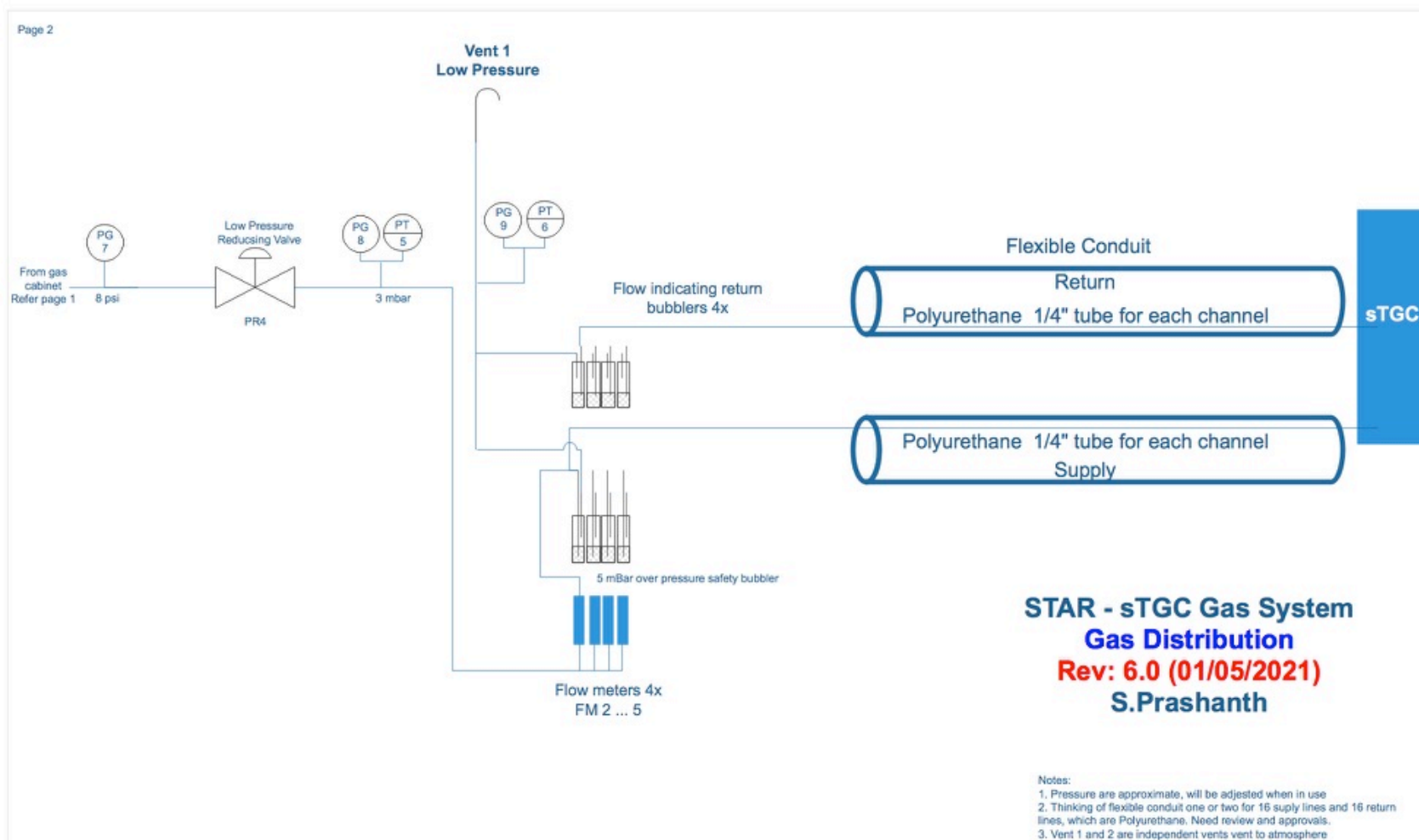
# Gas Mixing System



Second plate to the cabinet

Gas Mixing Cabinet

# Gas Distribution System



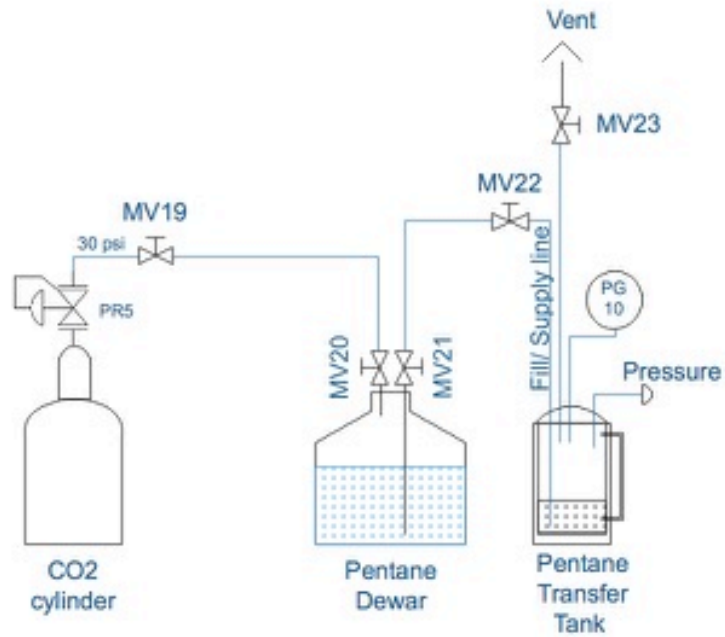
- Earlier we decided to use independent supply and return line to each quadrant, i.e. 16 supply and return lines
  - This allows to shutdown a leaking chamber without affecting any others
- But, limited space on the west pole tip doesn't allow to do this
- So we decided to use one supply and one return line for each plane, i.e. 4 quadrants
  - One leaking chamber can kill entire plane



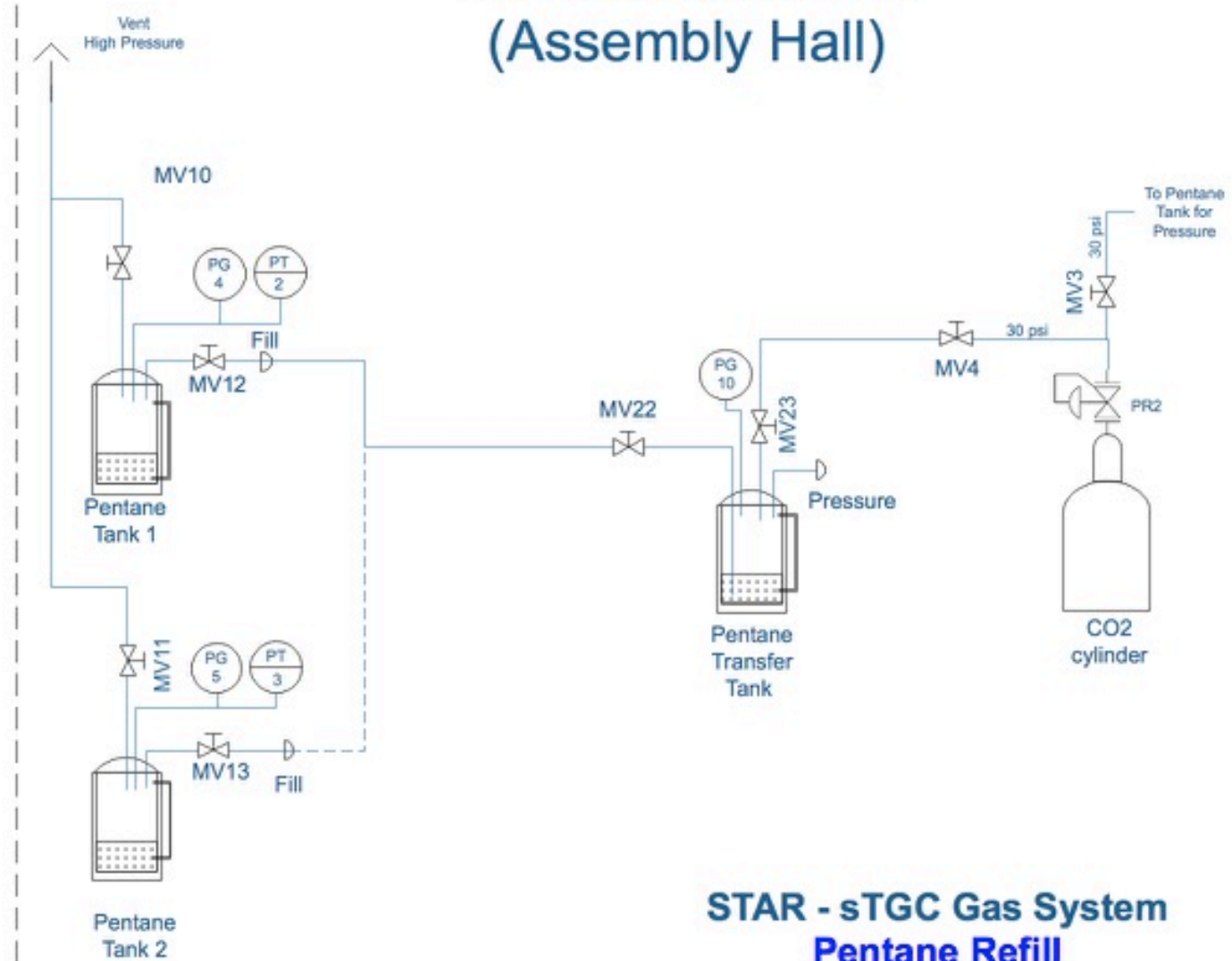
# Pentane Refilling Procedure

Page 3

## Fill Transfer Tank (Gas Pad)



## Fill Cabinet Tanks (Assembly Hall)



**STAR - sTGC Gas System**  
**Pentane Refill**  
**Rev: 6.0 (01/05/2021)**  
**S.Prashanth**

# Gas Pressure Regulator – Recommendation from Readines review



- Same regulator that ATLAS use was bought
- Performs as expected, for supply pressure 0-15 psi range out put is constant at 5 mbar



# Gas Supply and Vent Lines



Heat Tape Controller



Gas distribution flow meters and bubblers need to be mounted in a suitable place to avoid back pressure

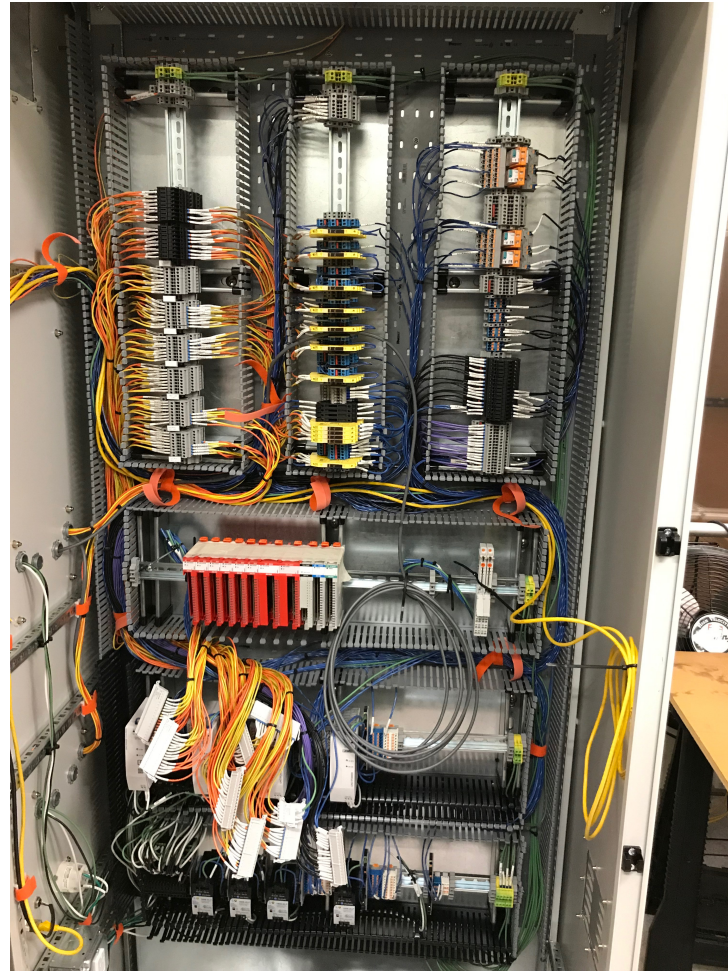


Vent Mufflers

- Vent mufflers need to be installed on a nice weather day
- Goes on top of the STAR control room
- Half day job



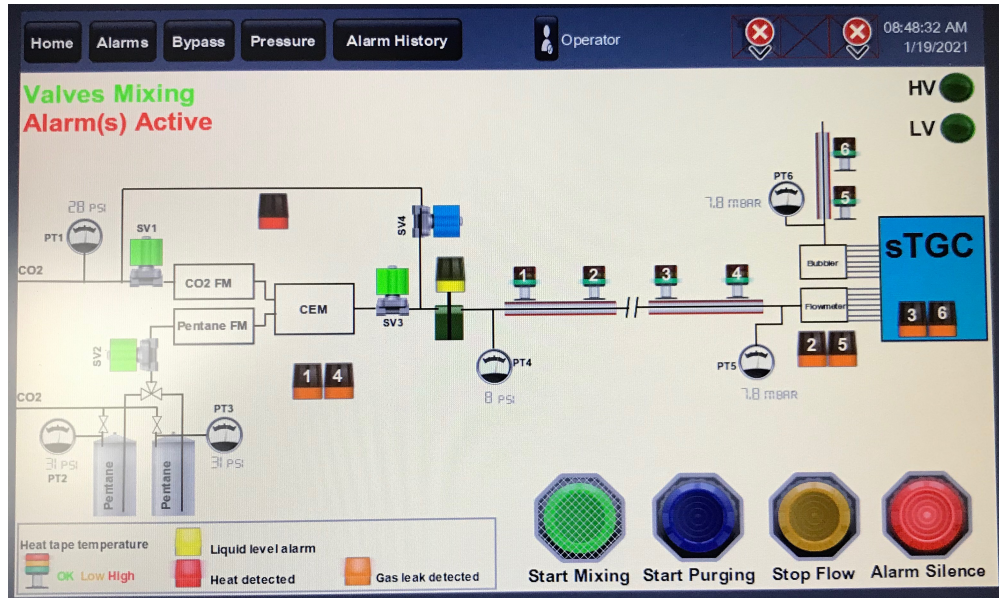
# Controls Cabinet and other controls



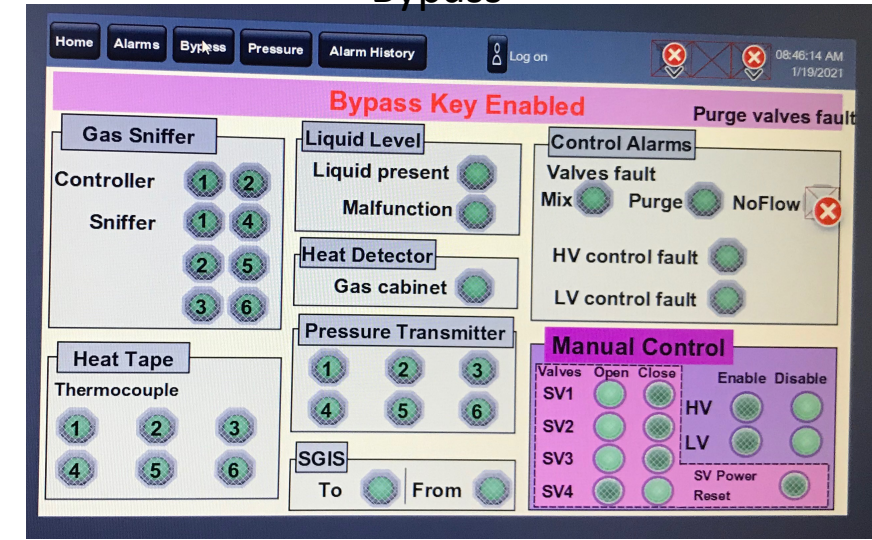
← To Control room



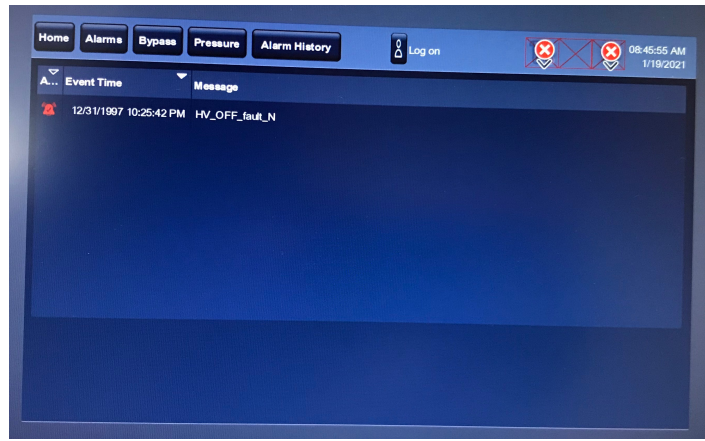
# Interlock GUI



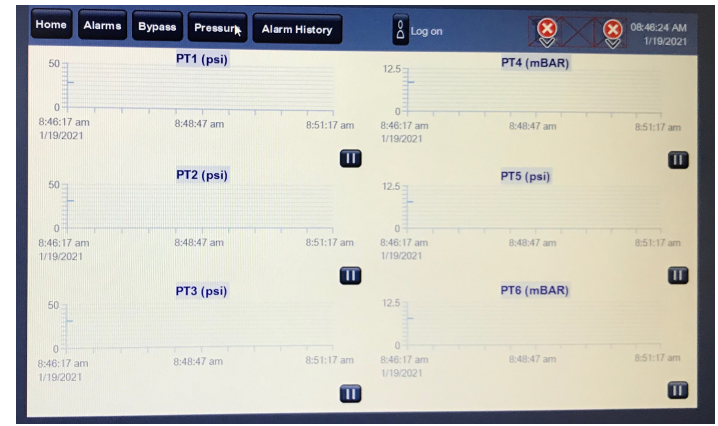
## Bypass



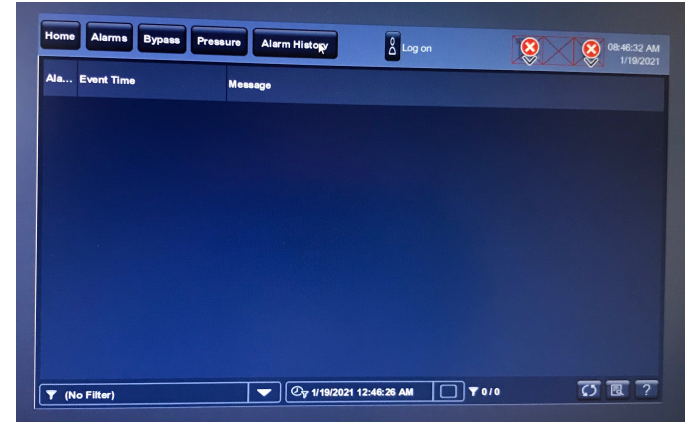
## Active Alarms



## Pressure Readings



## Alarm History

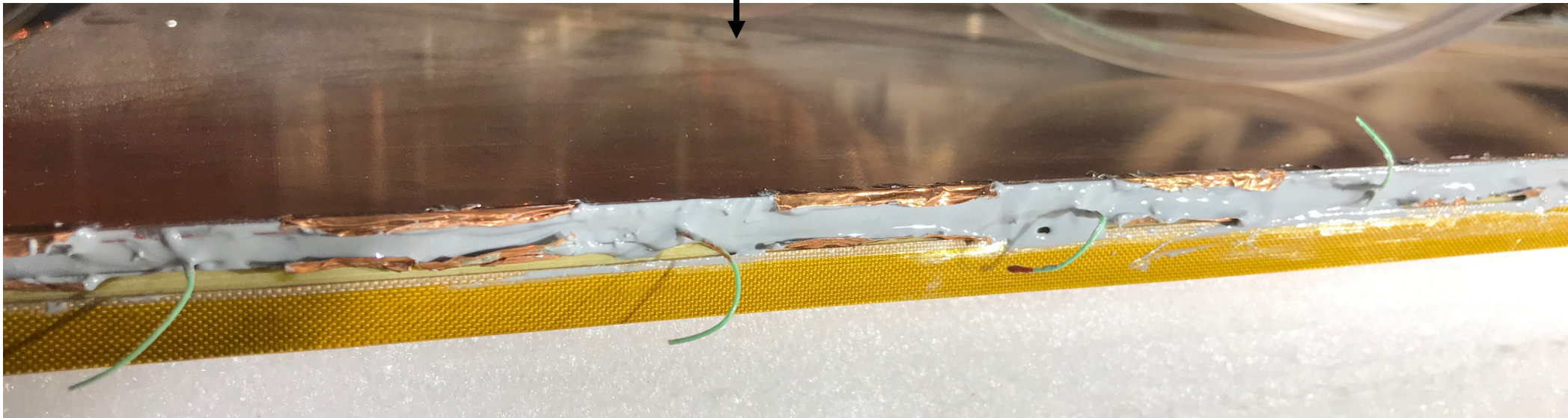
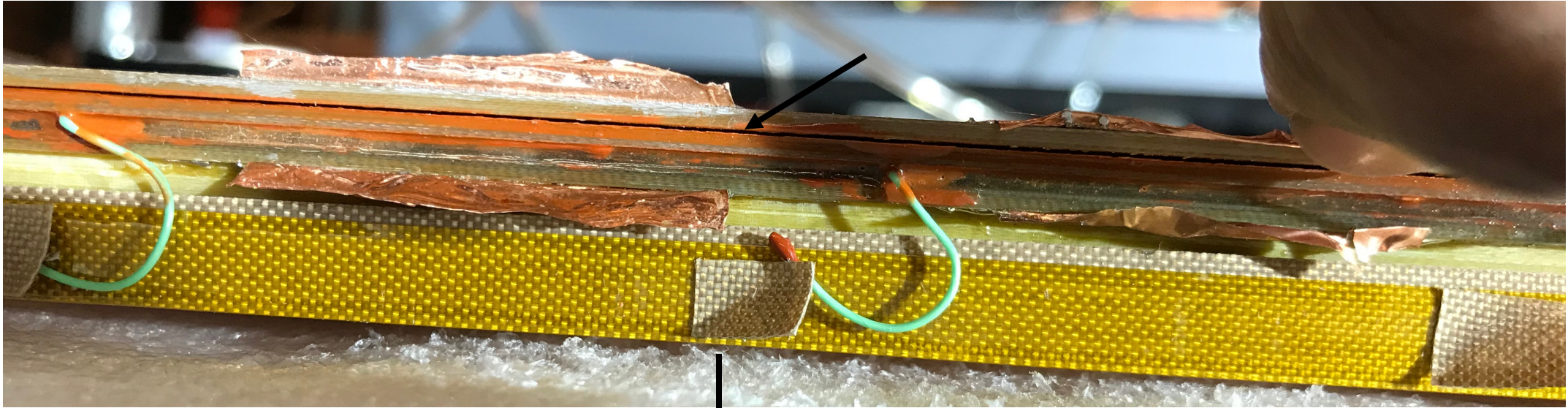




# Remaining Activities

Task	Estimate ( in days) Most of the items can be done in parallel	People	Comments
Gas cabinet	5	Bob, Prashanth	
Gas lines/ Vent	3	Bob, Prashanth	
Gas distribution	15	Bill, Prashanth	Was plan to do next run, but I am doing for this run. Some complications in selecting parts and design.
Heat exchanger			New part for pressure relief needed
60 x 60 Prototype assembly	10	Bill, Mike, Prashanth	
Controls cabinet	10	Mike	Mike is waiting on some parts
Gas cabinet wiring	5	Mike	Mike is waiting on some parts
Control room wiring	1	Mike, Bob	
Wiring at STAR	2	Mike	
PLC integration to controls cabinet	5	Mike, Prashanth	
Gas system testing	10	Bill, Bob, Christian, Mike, Rahul, Prashanth	
Interlock testing	10	Bill, Bob, Christian, Mike, Rahul, Prashanth	
Documentation and Procedures	10	Mike, Prashanth	
Safety approvals	15		

# Leak fixed in 60 x 60 prototype







30 x 30 prototype

60 x 60 prototype