S20 DS-DPS Vacuum Problem Troubleshooting

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Date: 3/4/2022

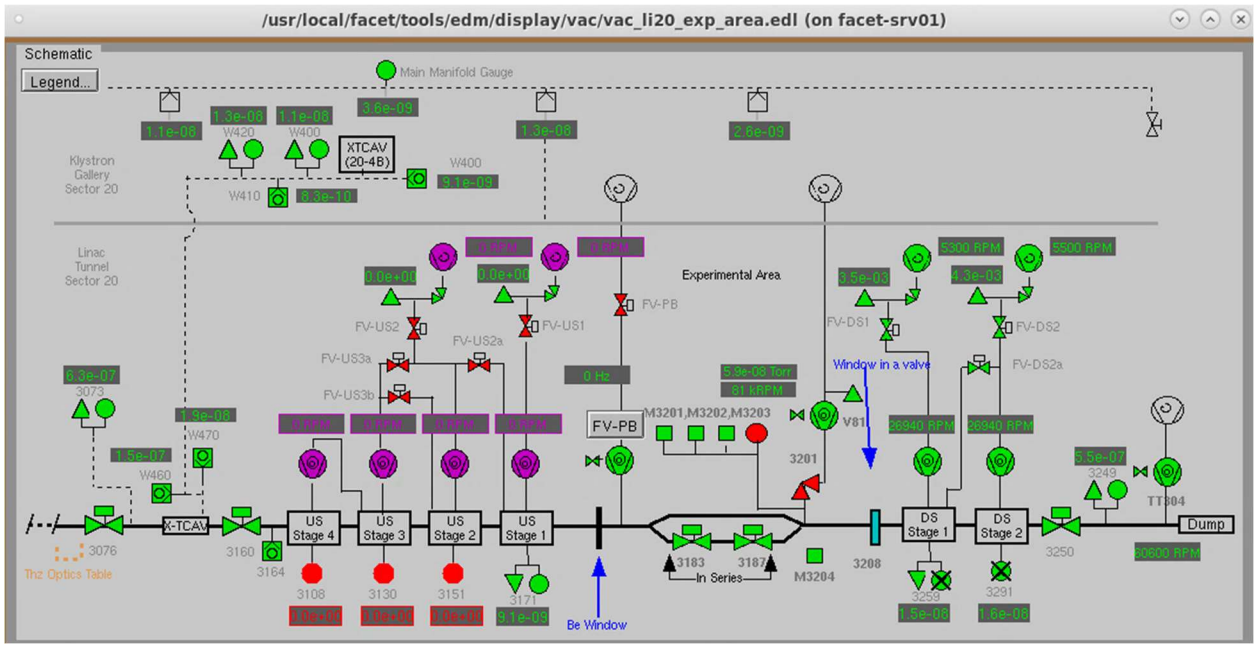
Summary:

In the case of pressure rise on gauges 3259 and 3291, follow these steps to isolate the problem stage of pumping from the beamline to stop the pressure from rising further. In most cases this will isolate the beamline and allow the other remaining operating stage to pump down the beamline and allow operations to commence.

I would request that ops not attempt to restart the pumps at this time. The restart procedure involves "expert" advice on assessing the beamline conditions and taking different actions depending on the various valve, pump, and pressure statuses.

DPS Schematic:

This is the full vacuum schematic in Epics. **Note – you MUST click on the "DPS full schematic…" button on the LI20 vacuum page in order to see the full schematic.**



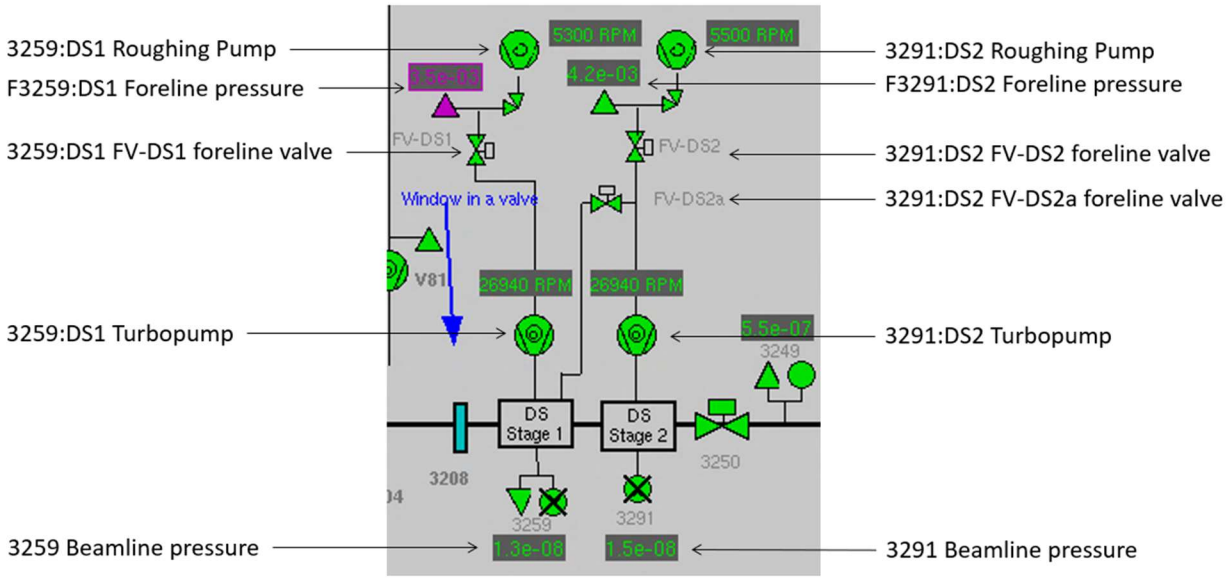
Notes:

1) Only the downstream DPS system is installed at this time. Please ignore the 3108, 3130, 3151, and 3171 pumps until the US-DPS system is installed.
2) The F3259 and F3291 Pirani gauges loose communication and turn purple for ~1 second on a regular basis. This is a known issue.
3) The valve labeled FV-DS2a should not be touched as it will have no effect on anything.

Important note – Do not attempt to restart any of the DPS turbos without first looking at the statuses of the full system on the full schematic and seeking out "expert" advice. Within the full schematic you should be able to find the DS-DPS roughing pumps, turbos, and valves as shown below.

DS-DPS Elements of Interest

The DS-DPS consists of 2 stages – DS1 with unit numbers 3259, and DS2 with numbers 3291:



Note – the "bypass" line between FV-DS2a and DS Stage 1 is not yet installed.

Legend:

 = Turbopump

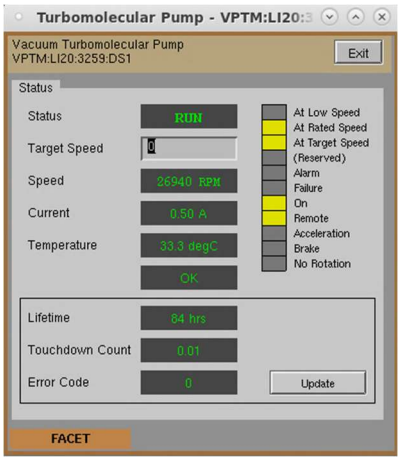
 = Foreline Pirani gauge

 = Roughing pump

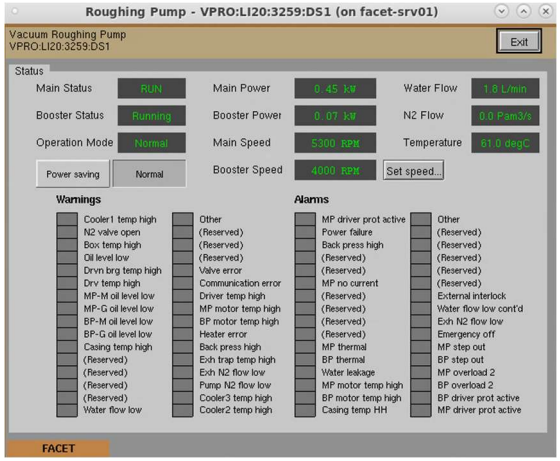
= Foreline valve

Clicking on any of these elements on the Full DPS schematic page will open up the control panel for each element. Clicking on the "More" button on the turbo and roughing pump will bring up more status indicators including the warning/alarm flags.

Turbopump "More" panel:



Roughing pump "More" panel:



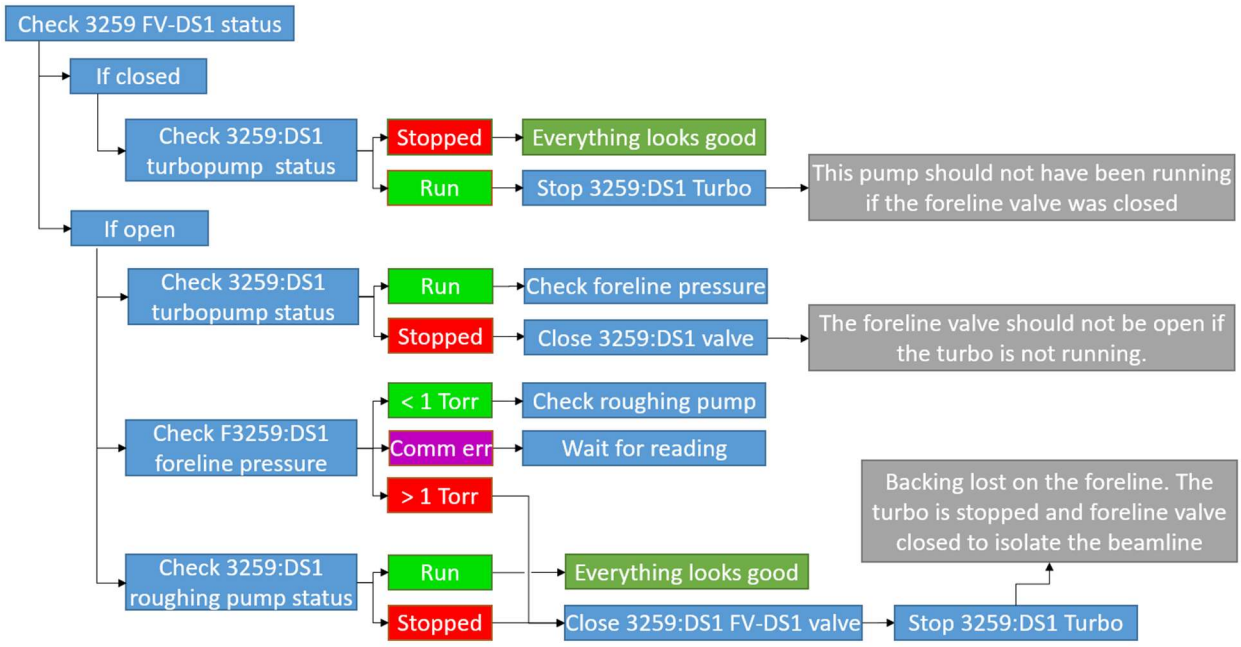
DS-DPS Troubleshooting Steps – Isolating the problem

1) Open the full schematic: Select **"DPS full schematic…"** from the LI20 Vacuum page on Epics.

2) If the **3259:DS1 FV-DS1 foreline valve is closed** AND the **3259:DS1 turbo is off**, then this stage is in the normal "off" state – go to step 4.

3) If the **3259:DS1 FV-DS1 foreline valve is open**, and either the **3259 turbo or roughing pump (or both) are off**, then this indicates a problem with this stage. The flow chart indicates the actions to be taken to put the stage into an "off" state:

DS1 troubleshooting flow chart:

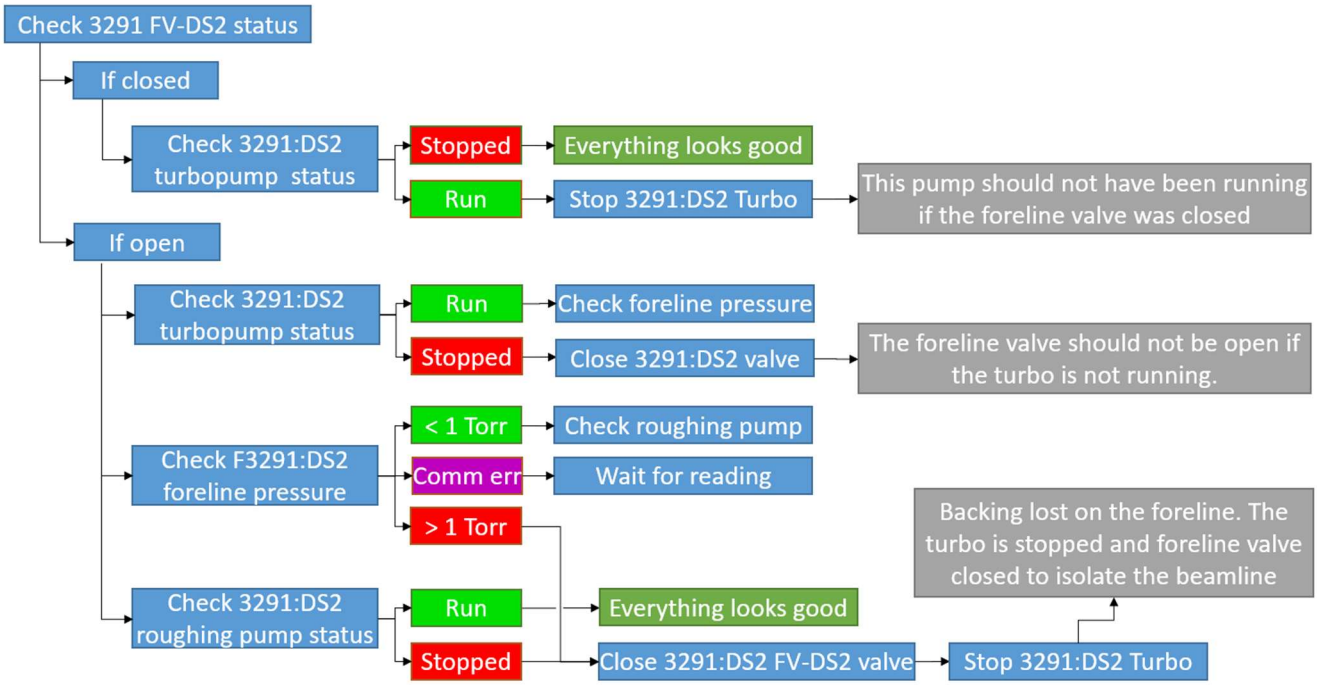


If you get to the green “Everything looks good” box, then this stage appears to be in a good state.

4) Now – assess the DS2 stage in the same way: If the **3291:DS2 FV-DS2 foreline valve is closed** AND the **3291:DS2 turbo is off**, then this stage is in the normal “off” state – go to step 6.

5) If the **3291:DS2 FV-DS1 foreline valve is open**, and either the **3291 turbo or roughing pump (or both) are off**, then this indicates a problem with this stage. The flow chart indicates the actions to be taken to put the stage into an “off” state:

DS2 troubleshooting flow chart:



6) If at this point either of the 3259 or 3291 turbos are running, the beamline should be pumping down to <1e-6 Torr in a very short period of time. If neither is running, but the 3250 valve is open – then the beamline should be slowly being pumped down through the dump line turbo.

7) If both turbos are off and the 3250 valve is closed, then this section of the beamline will not pump down until one of the pumps is restarted.

I would request that ops not attempt to restart the pumps at this time. The restart procedure involves assessing the beamline conditions and taking different actions depending on the various valve, pump, and pressure statuses.

If you reach this state and cannot continue or experience any difficulties – please call Doug Storey at SLAC extension # 3020, or cell # 650-656-5940.