WIYN Lightning Shutdown Procedure and Guidelines

June15, 2016

There are a few things to be aware of before anything else:

1. We must have the weather instrument disconnected from the tower; unplug the wind bird that attaches the Young Weather Station.

2. The Dome, Control room, and Weather Tower are all effectively connected to earth ground but being inside the control room is required during storms or threat of lightning.

3. Phones, water lines, doorways… these are all things that have the potential to carry lightning energy to your body. During a storm, or threat of storm, stay away from these areas.

4. If you can hear thunder within 30sec of seeing lightning, you and your observers, anyone, must seek safety indoors or in a vehicle.

5. You, and only you, are the judge of whether or not an approaching storm is a threat. The decision to prepare the facility for lightning is yours. If in doubt, try to use the 30 second rule as above, or proceed to do the most safe and cautious action.

Shutdown Procedure

1. **Disconnect the weather tower** from the Young Weather Station in the computer room – disconnect the wind bird.

2. **STA1**: *Steps a – d can be done anytime in preparation for a potential storm. If there is threat of a storm (or a storm is imminent) then step "e" should be initiated. This is to try to avoid having the CCDs get too cold for an extended period.*

a. Locate the MOP interface GUI. It may be running locally on the machine via its native session, or it may be running on a vncviewer, cork:1 (vncviewer cork:1).
b. Locate the menu 'Tools' on the MOP interface.
c. Select 'Disconnect CCD Voltages'. This will 'safe' the detector for when you remove power. You want to avoid yanking power when control voltages are still applied to the CCD.
d. Select 'Exit and shutdown PAN', which brings the PAN software down gracefully, and quits the MOP.
e. Remove power from the DHE power supply (turn it off and unplug from the bottom of the power supply). The supply is on the side of the bench table.

3. If **WHIRC** is Cold and to be Used: on wiyn-3 there should be a vncviewer to DUST and the WHIRC Engineering GUI. Verify that the Detector Bias and Power are OFF.

a. The OA/Observer will almost always leave the instrument in the 'safe' state, no power or bias to the detector. OA's should strive to do this anytime the instrument is not in use.
b. Via the iBoot ethernet power switch, power off the WHIRC DHE.
c. Power off control electronics, level-'b'. Be careful, you and the staff

are now blind if WHIRC warms up. *What is the hold time and when was the last fill?*

d. Quit the Engineering GUI and Cntrl-C any terminal windows.

e. Verify that temperatures are being read by the Engineering GUI, and that the heater power is being applied (assuming that the coldplate temp is well below 78.5°K).

4. ODI

a. Shutdown the instrument via software control if in use.

b. Turn off the Agilent (StarGrasp) power supplies.

c. As an extra layer of protection

i. Unplug the 30amp power cord located below the ISP, large yellow connector (twist and pull)

ii. Quit the temperature controller, vncviewer to almond, for the StarGrasp electronics.

iii. Shutdown the ODI StarGrasp chiller.

d. The ODI dewar cooling system stays active.

In case of a power outage, be prepared for the ODI Helium compressors to not autostart correctly and the ODI dewar to warm up. In case of severe, repeated power outages or Helium compressor failures, the ODI warm up procedure or an ODI emergency shutdown may need to be initiated. Should ODI warm up, operations can resume only after pumping and cooling of the dewar.

e. Should any outside heat exchanger fail during a storm, let ODI warm up. Under no circumstances should staff endanger their safety during an active storm in order to restart an outside component.

5. Other Instruments (not HYDRA or WTTM): Shutdown and quit software as is normally done. HYDRA: no action required

6. Bench Electronics: no action required

7. Visitor Instruments: not KPNO staff's or WIYN staff's responsibility. It is courtesy to advise the user of the instrument to power off and disconnect power if possible.

Power UP Procedure

Power up only when judged to be safe. Typically, 1/2hr after the storm has passed is ok, but you clearly have to be mindful of other storms, etc. If you can still hear thunder 30sec after seeing a flash, the storm is still too close.

Power up the instrument(s) that are to be used for science. You can leave all others powered off and in the safe state.

1. STA1: You now need to start the MOP so that the detector can be 'wiped' repeatedly and be ready for use; best if it is powered up and functional 1hr before observing but not required.

a. Power up the STA1 DHE power supply.

b. On wiyn-2, mouse the button 'Clear Pan' and then 'Start Pan'. Two windows will appear. **<u>Be sure the PAN comes up cleanly</u>**

c. Mouse the button 'MOP' which will fire up the MOP.

d. Reset the Lakeshore heater.

e. Take a test image (e.g. bias) to verify that the detector reads out normally. The observer is wise to take a series of "junk" biases, recommend 3 or more, so the detector is further wiped before use.

2. **WHIRC**: If cold and to be used:

a. Power up the DHE via the iBoot ethernet power switch.

b. Power up the WHIRC electronics.

c. Mouse the icon 'WHIRC ENGR' on WIYN-3, the OA station. This brings up the temperature/filter control information.

d. Verify that the coldplate temperature of the instrument is below ~78°K. If not, contact the OA, EM, or a WIYN engineer immediately, it may require a fill.

e. Verify that temperatures are being read by the Engineering GUI, and that the heater power is being applied (assuming that the coldplate temp is well below 78.5°K).

3. **Turn on the ODI StarGrasp chiller**, requires that the outside heat exchanger is operating.

a. On a vncviewer session to Almond, use the command 'odichill.py' in a terminal to start the temperature control GUI.

b. Monitor to be sure thermal control is achieved.

4. **Start other instruments**, if they are going to be used, as required.

5. If the weather is clear, and you are likely to observe, **plug in the weather tower sensor cable** back to the weather controller. Otherwise, leave the weather sensors off and the sensor cable unplugged.

6. **Make sure that systems are working**; phones, Internet, computers, telescope, pms system, etc. Don't wait until you are ready to observe to find out something is dead.