Launching Balloons Using Helium or Other Commercial Gas

I. Purpose:

This procedure explains how to use helium and other commercial gas cylinders for launching Balloon-Borne Sounding System (BBSS).

II. Cautions and Hazards:

- Note that there are extra safety precautions when using hydrogen cylinders. A different procedure will be issued for the use of commercial hydrogen cylinders.
- Regulators used for helium differ from those used for hydrogen. The inlet union thread is "right hand" for helium and "left hand" for hydrogen.
- The function of the regulator is to reduce and regulate the pressure of the gas entering the gas distribution system.
- The regulators used on commercial cylinders have two pressure gauges; one measures the cylinder pressure while the other measures the output pressure of the regulator.

III. Requirements:

None.

IV. Procedure:

A. Filling a Balloon:

1. Select commercial gas on the gas distribution panel in the hydrogen generator room.
2. Attach the earth clamp to the cylinder if hydrogen.
3. Remove the plastic bung from the cylinder outlet.
4. Inspect the threads in the cylinder outlet for damage. Do not attempt to fit a regulator to a cylinder with damaged threads.
5. Slightly open the cylinder valve for an instant to blow any scale or dust from the cylinder outlet.
6. Check that the regulator pressure adjustment screw knob is fully open and turns freely (adjusted for zero output pressure and not compressing the internal spring).
7. Check the condition of the O-Ring fitted to the regulator inlet union and replace if missing or damaged. Note: Spares are held on site in the Y-Van amongst the RBL spares.

8. Attach the regulator to the cylinder by screwing the inlet union nut of the regulator into the cylinder outlet. For helium this is a right hand thread. Tighten with a suitable open-ended spanner.
9. Ensure that the balloon fill valve (on the wall beside the cylinders) is closed.
10. Very slightly open the cylinder valve initially to pressurize the input of the regulator gradually, then fully open the valve. (It is good practice to allow pressures to rise slowly) Never leave the cylinder valve partly open, as these valves can leak from around the shaft. Fully opening the valve prevents this possibility.
11. Slowly turn the regulator pressure adjustment knob clockwise until about 500kpa pressure is indicated on the output pressure gauge. The system is now ready to inflate the balloon.
12. Commence balloon inflation by slowly and fully opening the handle valve on the wall (balloon filling valve) beside the cylinders. If the RBL regulator in the hydrogen generator room vibrates, close the valve momentarily and open slowly again and it should be quiet. The pressure reading on the RBL regulator should be 150kpa.
13. At completion of the fill, close the balloon-filling valve.
14. Close the cylinder valve fully. This prevents the loss of the entire cylinder contents over time if there is a small, undetected leak. The system may be left in this state until the next flight.
15. At the next flight, open the cylinder valve slowly again and then fully and commence the fill.

B. Changing Cylinders

1. If the cylinder has run out before the balloon fill is complete, stop the stopwatch.
2. Close the cylinder valve and ensure that the regulator pressure adjustment knob is adjusted to allow output.
3. Release the remaining gas (de-pressurize) in the system by momentarily opening the balloon-filling valve.
4. Back off the regulator pressure adjustment knob until it is free.
5. Unscrew the regulator from the cylinder using a suitable open-ended spanner.
6. Fit the regulator to the next cylinder, following the steps above starting from step 2 and restart the stopwatch when filling is resumed.

V. References:

None.

VI. Attachments:

None.