CCR Student Skills In Confined Water

- **Preparation Checklist**
  - Walk students through the "Pre-Dive Check" Sequence
  - Emphasize that students must work in buddy teams PRIOR TO IMMERSION
  - Remind students to close the mouthpiece when switching to OC
- **Introduction to CCR**
  - Breathe on unit at rest - Once comfortable, swim unit
- **Buoyancy Practice**
  - Oral Inflation of BCD for Buoyancy Control
  - Repeat above drill using BCD with auto inflation
  - Practice buoyancy control with use of breathing bags as backup
  - With use of BC students maintain a stable depth at rest
  - Ascend in gradual steps of approximately 1½ feet (½ meter) at a time maintaining a stable swim depth
  - Repeat the sequence while descending
  - Students should make a gradual ascent and hover at assigned levels
  - Repeat during descent
- **Acclimatization to Loop Volume and Delivery Capabilities**
  - Complete rapid swims to allow individuals to discover that the system provides ample gas flow
- **Counterlung Volume Control**
  - Have students swim while varying depths - Divers should be able to maintain adequate bag volume without having to stop swimming
- **Introduction to Minimum Loop (Constant Loop) Volume Diving**
  - Demonstrate Constant Loop Volume Technique as a means of better buoyancy control and less drag while swimming
  - Constant Loop Volume Technique: Students in confined water establish a loop PO_2 of greater than the setpoint - The PO_2 should be set between 0.4 and 0.7 as a safety measure - The diver should establish a minimal loop volume so that on a full inhalation the counterlung is bottomed out
  - Swim unit for a reasonable time becoming familiar with constant loop volume diving and its ease of manually maintaining the PO_2
- **Technique Practice, Readjustment, Trim and Configuration of Unit**
- **Practice OC Bailout**
- **Emergency Drills**
  - Hyperoxia Drill
    1. Simulation: The diver has recognized a high PO_2 on display, heard an audio warning or heard a solenoid stick in the open position

2. Procedure: Switch to OC - Inhale from OC - Switch to CC and begin a diluent flushing of unit - Carefully monitor the PO_2 during this procedure - Breathe from CC when PO_2 reaches an acceptable level

- Simulate Hyperoxia Drill due to a failed solenoid

3. Repeat Procedure 2. above but also turn oxygen supply gas off - Maintain PO_2 by manually turning oxygen valve on and off

- **Simulation Drill of Failed Open Solenoid**
  - Establish a high setpoint and maintain a PO_2 that is less than this by diligent control of the oxygen supply valve
- **Hypoxia Drill**
  - Simulation: Student has recognized a low PO_2
  - Procedure: Switch to OC, check display, inhale from OC, switch back to CC and begin a diluent flushing
  - Recheck display and adjust PO_2 to appropriate level by using oxygen addition valve, recheck display and continue breathing from CC if appropriate
- **Simulation Drill of a Solenoid Failed in the Closed Position**
  - Student is to set a low setpoint and maintain a PO_2 that is above this value by the manual addition of oxygen
- **Hypercapnia Drill**
  - Simulation: Student has determined that his/her canister broke through
  - Procedure: Abort to OC
- **Loop Flooding Drills**
  - Demonstrate partial flood recovery

1. Procedure for Partial Flood: Look up and exhale while rolling exhalation hose downward - Allow gravity to move water downwards into the exhalation counterlung
2. Exhaust fluid through the exhaust valve on the exhalation counterlung by purging the diluent addition valve if applicable on unit

- **Manual Control**
  - Practice flying unit under manual control by lowering the PO_2 setpoint and manually maintaining a higher setpoint monitor PO_2
  - Practice flying unit manually by turning oxygen cylinder valve on and off
- **Semi-Closed Circuit (SCR) Operation**
  - Fly unit as SCR using diluent addition
  - Exhale and do a diluent flush every 3 to 5 breaths
- **Metabolism Exercise**
  - Instruct divers to adjust to a PO_2 above where the setpoint is
  - Monitor how long it takes for the PO_2 to drop 2 points at rest (i.e. 0.7 to 0.5)
  - Repeat the above exercise while swimming
- **Post-Dive Procedures & System Clean Up**

