Laboratory Risk Assessment

Below are listed the risks involved in using equipment in the Mechanical Controls Systems lab.

1. **Motomatic**
   
   a. Rotating parts – Use eye protection whenever running the Motomatic. Keep long hair and loose jewelry away from the spinning motor.
   
   b. The small connection pieces that couple the motor to the speed reduction pulleys can fly off if not properly secured before the Motomatic is run.
   
   c. Beware of overspeeding the Motomatic’s electric motor. If too much voltage is applied to the motor or its feedback connection is lost during closed-loop operation, the motor can overspeed, possibly destroying itself and flinging loose parts away from the motor base.
   
   d. This system does not have a large, red, obvious kill switch. If anything untoward occurs, shut the experiment down by switching off the white power switch in the lower left corner of the control console.

2. **Pneumatic Positioner**

   a. Compressed air – Compressed air stores a lot of energy. Do not turn the compressed air on until you are ready to run the experiment. Do not leave the compressed air on while you are not running the experiment. The compressed air supply to the experiment is supplied by a ball valve on the copper pipe leading to the experiment set-up. Like all ball valves, it is off when the handle is 90º to the pipe. It is on when the handle is lined up with the pipe.
   
   b. Pneumatic cylinder – Under the influence of compressed air, this cylinder can move rapidly from one end of its stroke to the other. Never operate the experiment with the plastic protection pieces removed. Never place any part of your body along the line of travel of the cylinder.
   
   c. Beware of possible pinch points beyond the range of the plastic shield. It is possible to get a finger crushed by the moving mass in the area not protected by the plastic shield. Since you run the experiment using the mouse and keyboard from the computer, just keep your distance from it when performing a step response.
   
   d. Do not tinker with or remove any of the hoses or fittings on the experiment set-up. If they are loaded with compressed air, energy could be released suddenly.
   
   e. Beware of what your lab partner(s) is doing. Make sure your lab partner stays away from the dangers mentioned above. Do not induce a step input unless and until you are aware of your partner’s location and unless and until your partner is aware that you are running a step response.
   
   f. After you are done running the experiment, shut off the power to the servo amp by turning off the switch on the plug strip. Also shut off pneumatic pressure at the supply ball valve.
All Labs

a. Any electrical equipment should be turned off except when you are actually running the lab. To avoid forgetting this, turn the equipment off just as you are finished running the lab.

b. For the Motomatic and Hydraulic/Pneumatic Positioner, wear safety glasses when the equipment is being run.