## Robotics and Manufacturing Automation Laboratory (Mechanical Eng'g Dept.)
## STANDARD OPERATING PROCEDURE (SOP)

| Name of SOP | PUMA 560 Robot Arm |
|---|---|
| Effective Date | June 1, 2004 |
| Author | Dr. G. Bone |
| Reason for SOP | Risk of injury from contact with moving robot arm |
| Approved by (supervisor) | Dr. G. Bone |
| Date reviewed by JHSC | May 12, 2010 |

**Definitions**

| Terms | none |
|---|---|
| acronyms | RMM – Risk Management Manual<br>JHSC  - Joint Health and Safety Committee<br>EOHSS - Environmental Occupational Health & Safety Service |

**Requirements**

| **Applicable OHSA regulations and / or codes of practice.**<br>  1. OHSA code.<br>  2. ANSI/RIA R15.06-1999 Standard for Industrial Robots and Robot Systems - Safety Requirements<br>  3. McMaster University Risk Management Policies:<br>    a) RMM #301 Standard Operating Procedure<br>    b) RMM #300 Safety Orientation and Training Program<br>    c) RMM #309 Laboratory safety manual |
|---|
| **Training and competency.**<br>  1. Training provided by the laboratory supervisor, Dr. G. Bone in the Mechanical Engineering Department.<br>  2. Competency to be demonstrated by the individual after training |

**Description of the Task**

| **Location and time of work** | JHE A104 during normal working hours |
|---|---|
| **Individuals and skills required** | Graduate Students & Research Staff, none |
| **Equipment and supplies required** | PUMA 560 Robot Arm controlled by either the teach pendent or a VAL2 program running on the robot control unit |
| **Personal protective equipment required** | none |

**Sequential steps to complete the work safely.**

**General safety instructions**

1. All users must obey the safety instructions listed in the Unimate PUMA Mark II Robot 500 Series Equipment Manual and in the Unimate Industrial Robot - User's Guide to VAL2.
2. The operator should only access the robot arm's working space when the robot arm power is turned off.
3. When operating the robot arm always have an emergency stop button close at hand. This can be either the emergency stop button on the teach pendent or the emergency stop button on the front of the control unit.
4. Never place yourself in a location that confines you between the robot arm and another object.
5. If another person is inside or approaches the robot arm's working space and the arm power is on then press an emergency stop button immediately.

**Specific instructions for the operation of the PUMA 560 robot arm:**
1. Place yourself in a location safely outside the robot arm's operating zone.
2. Turn on the robot control unit.
3. If operating with the teach pendent then refer to the Unimate PUMA Mark II Robot 500 Series Equipment Manual for detailed operating instructions.
4. If operating the robot using a VAL2 program then refer to the Unimate Industrial Robot - User's

Guide to VAL2 for detailed operating instructions.
5.  Set the motion speed to be less than 250 mm/s.
6.  When it is required to move the robot arm then turn on the arm power.
7.  When done working with the robot arm move it to a retracted position.
8.  Turn off the arm power by pressing the arm power off button.

**Contingency Plan and Reporting**

**Accident / injury response**

**Minor Cuts and Bruises:**
1.  Go to nearest first aid station for treatment.
2.  Write and submit a safety incident report.

**Critical Injuries:**
1.  Shutdown equipment, secure area to prevent further injury
2.  Immediately arrange for medical and emergency assistance by calling Security at "88". Phone in JHE A104
3.  Apply first aid as required
4.  Notify laboratory supervisor (Dr. G. Bone) immediately
5.  For all injuries complete a "Injury/Incident Report" and provide a copy to the Chair and EOHSS
6.  In case of critical injury notify EOHSS immediately, ext 24352

**Spill response**
N/A

**Equipment shutdowns**
1.  Push one of the emergency stop buttons (either the emergency stop button on the teach pendent or the emergency stop button on the front of the control unit).

**Environmental Responsibility**

**Waste disposal procedures**
Procedure does not require disposal

**Building air quality**
Procedure does not effect air quality

**References** (OHSA/ regulations, EPA and Municipal environmental regulations, McMaster University Program/ Policy, Material Data Sheets (MSDS).
1.  RMM #301 Standard Operating Procedure
2.  RMM #300 Safety Orientation and Training Program
3.  RMM #309 Laboratory safety manual

**Distribution**
1.  Dr. G. Bone who is the lab supervisor
2.  Technical Staff of Mechanical Engineering
3.  Mechanical Engineering Chair
4.  Faculty of Engineering JHSC