

ROBOT PROJECT IMPLEMENTATION & SAFETY

**Dr. S. RAMABALAN,
PRINCIPAL,
E. G. S. PILLAY ENGINEERING COLLEGE,
NAGAPATTINAM.**

IMPLEMENTING ROBOT PROJECT: STEPS

1. Initial familiarization with the technology
2. Plant survey to identify potential applications
3. Selection of the application
4. Selection of the robot
5. Detailed economic analysis and capital authorization
6. Planning and engineering the installation
7. Installation

Safety in Robotics

2 aspects- 1. Justification of robots (hazards in the workplace include heat, noise, fumes and other discomforts, toxic atmospheres, and other health hazards).

2. Potential hazards to humans posed by the robot itself.

(3 occasions when humans are close enough to the machine to be exposed to danger these are : 1. During programming the robot, 2. During operation of the robot cell when humans work in the cell, and 3. During maintenance of the robot)

Workplace Design Considerations for Safety

Include physical barriers to limit intrusion into the cell, emergency stop buttons to halt the cell operation and laying out the equipment in the cell for maximum safety

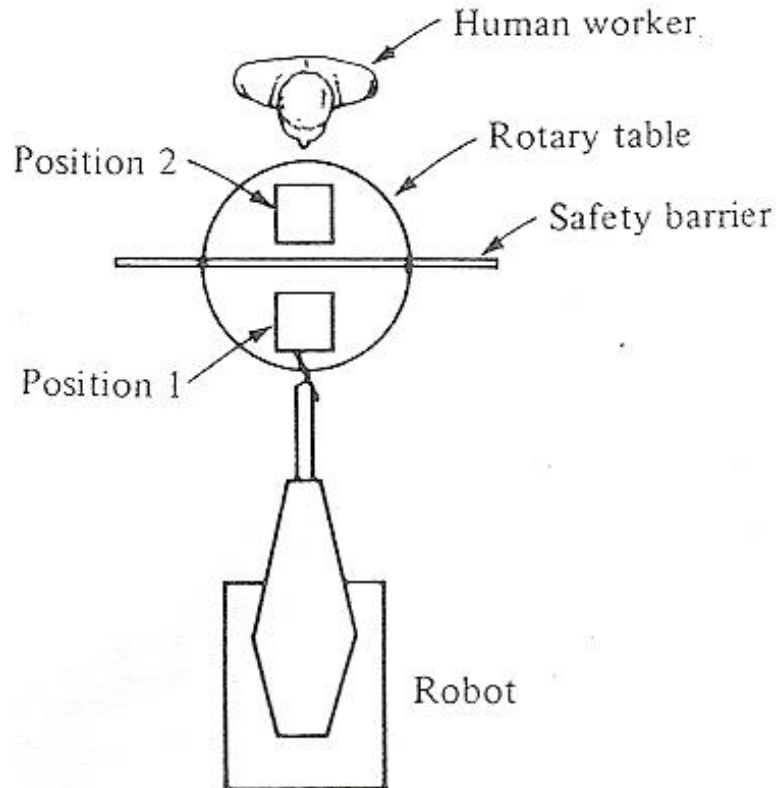


Figure 17-1 Cell layout using part manipulator to separate human worker from robot for safety and production efficiency.

Safety Sensors

3 levels of safety sensors

Level 1 – Perimeter Penetration detection

Level 2 – Intruder detection inside the work cell

Level 3 - Intruder detection in the immediate vicinity of the robot.

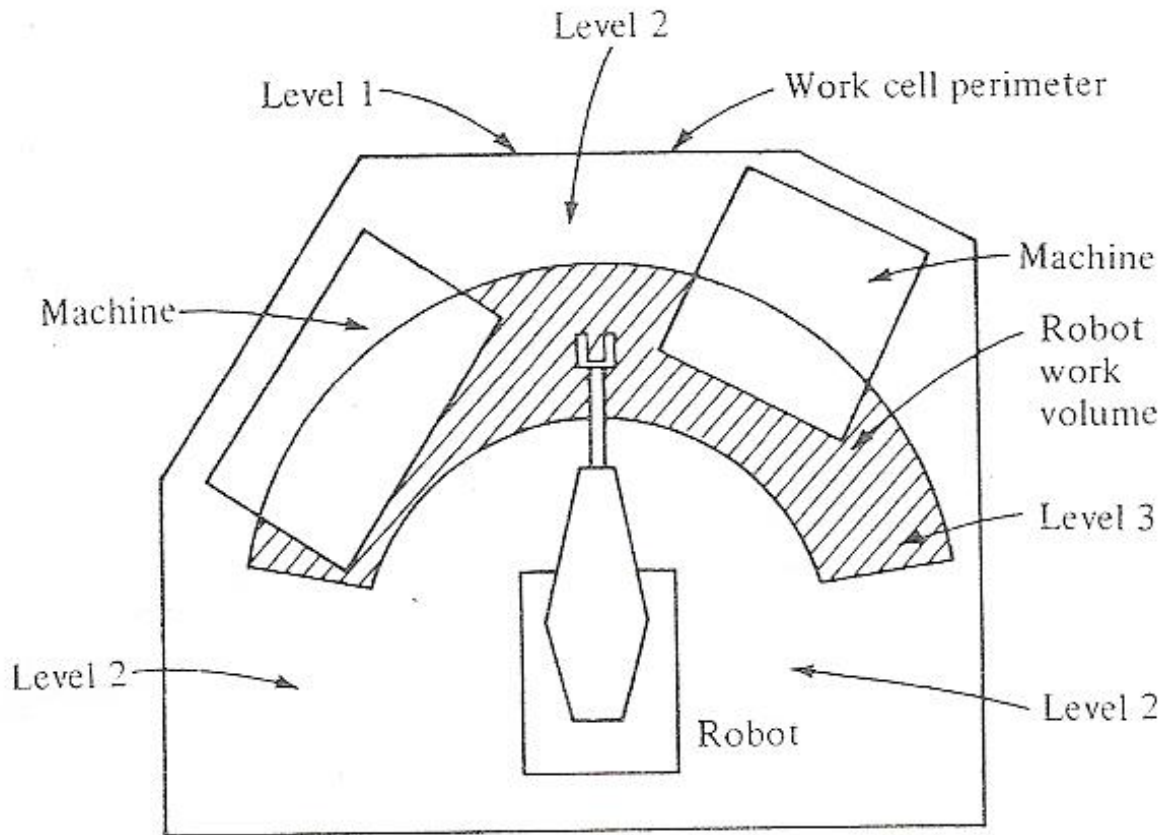


Figure 17-2 Three levels of safety sensor systems: Level 1—perimeter penetration; Level 2—intruder detection in the workcell; Level 3—intruder detection inside the robot work volume.

Safety Monitoring Strategies

1. Complete shutdown of the robot upon detection of an intruder.
2. Activation of warning alarms.
3. Reduction in the speed of the robot to a “safe” level.
4. Directing the robot to move its arm away from the intruder to avoid collision. –
“obstacle avoidance”
5. Directing the robot to perform tasks in another region of the work cell from the intruder.

* More sophisticated system used in safety monitoring is called a “fail safe hazard detector:

* other devices – panic button, dead man switch

THANK YOU FOR YOUR PATIENCE AND
TIME

