Industrial Robotic Arm & Automation Cell Safety Inspection Checklist

Site / Project		**Address**	
Inspector name		**Company**	
Date		**Time**	

Documentation aid only. Adapt this resource to the site, manufacturer instructions, and applicable local requirements. It does not replace a competent person, professional judgment, legal advice, or a required statutory form.

Inspection checklist

Perimeter Guarding & Safety Devices

☐ Verify light curtain functionality by interrupting the beam; robot motion should cease immediately. Record response time.	☐ Pass	☐ Fail	☐ N/A	Notes:	
☐ Confirm light curtains are positioned at a safe distance from the robot's maximum reach, based on stopping time calculations. Document calculations.	☐ Pass	☐ Fail	☐ N/A	Notes:	
☐ Test all emergency stop buttons (E-stops) within the cell; robot motion should cease immediately and reliably. Verify correct wiring and functionality.	☐ Pass	☐ Fail	☐ N/A	Notes:	
☐ Inspect safety gate interlocks; opening the gate should immediately stop robot motion. Check for physical damage and proper alignment.	☐ Pass	☐ Fail	☐ N/A	Notes:	
☐ Examine physical barriers (fences, walls) for damage, gaps, or modifications that could compromise safety. Measure barrier height (min. 1.4 meters).	☐ Pass	☐ Fail	☐ N/A	Notes:	
☐ Check the Safety PLC status indicators for any errors or faults. Review the PLC program for unauthorized modifications.	☐ Pass	☐ Fail	☐ N/A	Notes:	
☐ If equipped, verify two-hand control devices require simultaneous activation to initiate robot motion. Test anti-tie-down and anti-repeat functions.	☐ Pass	☐ Fail	☐ N/A	Notes:	
☐ Inspect any presence-sensing devices (e.g., laser scanners) for proper function and coverage area. Verify correct configuration and response time.	☐ Pass	☐ Fail	☐ N/A	Notes:	

- [ ] Ensure adequate warning signage is present and clearly visible, indicating robot operation and potential hazards. Verify compliance with ANSI Z535 standards. ☐ Pass ☐ Fail ☐ N/A Notes:

- [ ] Verify the robot cell perimeter is clearly marked with floor tape or paint, indicating the restricted area. Check for wear and tear. ☐ Pass ☐ Fail ☐ N/A Notes:

Teach Pendant & Programming Safety

- [ ] Inspect the teach pendant for physical damage (cracked screen, damaged cable, broken buttons). Replace if necessary. ☐ Pass ☐ Fail ☐ N/A Notes:

- [ ] Verify the teach pendant enable switch functions correctly; robot motion should only be possible when the switch is depressed. ☐ Pass ☐ Fail ☐ N/A Notes:

- [ ] Confirm the robot operates in reduced speed mode (250 mm/s or less) when using the teach pendant inside the cell. Measure actual speed. ☐ Pass ☐ Fail ☐ N/A Notes:

- [ ] Verify access to robot programming is restricted to authorized personnel only. Check password protection and user access levels. ☐ Pass ☐ Fail ☐ N/A Notes:

- [ ] Confirm that robot programs are regularly backed up and stored securely. Verify backup procedures are documented and followed. ☐ Pass ☐ Fail ☐ N/A Notes:

- [ ] Review robot collision detection settings; ensure they are properly configured to prevent damage to the robot and surrounding equipment. ☐ Pass ☐ Fail ☐ N/A Notes:

- [ ] Verify the robot has a defined safe home position that is free from obstructions. Check the home position accuracy. ☐ Pass ☐ Fail ☐ N/A Notes:

- [ ] Observe manual mode operation; ensure operators are trained and follow safe procedures. Check for jerky or erratic movements. ☐ Pass ☐ Fail ☐ N/A Notes:

- [ ] Confirm all personnel using the teach pendant have received adequate training and are competent in its operation. Review training records. ☐ Pass ☐ Fail ☐ N/A Notes:

- [ ] Verify a change log is maintained for all robot program modifications, documenting the changes, date, and author. ☐ Pass ☐ Fail ☐ N/A Notes:

Lockout/Tagout (LOTO) Procedures

- [ ] Verify that written Lockout/Tagout (LOTO) procedures are readily available at the robot cell. Check for clarity and completeness. ☐ Pass ☐ Fail ☐ N/A Notes:

Identify all energy isolation points (electrical, pneumatic, hydraulic) for the robot and associated equipment. Ensure they are clearly labeled.	Pass	Fail	N/A	Notes:	
Ensure sufficient LOTO devices (locks, tags) are available and in good working condition. Check for proper identification and traceability.	Pass	Fail	N/A	Notes:	
Observe LOTO procedures being followed during maintenance; verify proper application of locks and tags at all energy isolation points.	Pass	Fail	N/A	Notes:	
Verify that stored energy (e.g., pneumatic pressure, capacitor charge) is properly released or blocked before starting maintenance. Document verification.	Pass	Fail	N/A	Notes:	
If group LOTO is used, verify that procedures are in place to ensure each worker has individual control over the lockout. Check for accountability.	Pass	Fail	N/A	Notes:	
Confirm all personnel performing maintenance on the robot have received adequate LOTO training. Review training records.	Pass	Fail	N/A	Notes:	
Verify LOTO procedures are reviewed and updated at least annually, or whenever there are changes in equipment or processes. Document review date.	Pass	Fail	N/A	Notes:	
If contractors are performing maintenance, verify that LOTO procedures are coordinated between the contractor and the facility. Document coordination.	Pass	Fail	N/A	Notes:	
Verify that LOTO devices are removed only by the person who applied them, following established procedures. Document removal process.	Pass	Fail	N/A	Notes:	

Collaborative Robot (Cobot) Specific Checks

If the cobot uses force/torque sensors for safety, verify that they are properly calibrated and functioning correctly. Document calibration date.	Pass	Fail	N/A	Notes:	
Verify that the cobot's power and force limiting functions are enabled and properly configured to prevent injury in case of contact. Test force limits.	Pass	Fail	N/A	Notes:	
If using speed and separation monitoring, verify that the safety-rated monitoring system is functioning correctly and maintains a safe distance between the cobot and human workers. Measure minimum safe distance.	Pass	Fail	N/A	Notes:	
Test the cobot's safety-rated stop function; robot motion should cease immediately and reliably upon activation. Verify correct wiring and functionality.	Pass	Fail	N/A	Notes:	

- [ ] If using hand guiding, verify that the cobot responds smoothly and predictably to human guidance. Check for excessive force or jerky movements. Pass Fail N/A Notes:
- [ ] Verify that a thorough risk assessment has been conducted for the specific collaborative application, addressing potential hazards and mitigation measures. Review risk assessment documentation. Pass Fail N/A Notes:
- [ ] Assess the workcell layout to ensure that it minimizes the risk of collisions between the cobot and human workers. Check for adequate workspace and clear pathways. Pass Fail N/A Notes:
- [ ] Confirm that all operators working with the cobot have received specific training on collaborative robot safety and operation. Review training records. Pass Fail N/A Notes:
- [ ] Determine if any additional protective equipment (e.g., padding, sensors) is required to mitigate specific hazards identified in the risk assessment. Verify equipment is in place and functioning. Pass Fail N/A Notes:
- [ ] Verify that a regular maintenance schedule is in place for the cobot, including checks of safety-related components. Review maintenance records. Pass Fail N/A Notes:

Electrical Safety

- [ ] Verify grounding continuity of all robot components and electrical enclosures. Measure resistance to ground (should be less than 1 ohm). Pass Fail N/A Notes:
- [ ] Inspect electrical panels for damage, corrosion, or loose connections. Ensure panels are properly labeled and secured. Pass Fail N/A Notes:
- [ ] Examine wiring for signs of damage, abrasion, or deterioration. Replace any damaged wiring immediately. Pass Fail N/A Notes:
- [ ] Verify that overcurrent protection devices (fuses, circuit breakers) are properly sized and functioning correctly. Check for correct amperage ratings. Pass Fail N/A Notes:
- [ ] Test the Emergency Power Off (EPO) circuit; verify that it de-energizes all robot-related equipment immediately. Check for proper wiring and functionality. Pass Fail N/A Notes:
- [ ] Verify that an arc flash hazard assessment has been conducted for the robot cell. Review assessment results and ensure appropriate PPE is available. Pass Fail N/A Notes:
- [ ] Confirm that all personnel working on or near the robot's electrical systems have received adequate electrical safety training. Review training records. Pass Fail N/A Notes:

- [ ] Inspect conduit and cable management systems for proper support and protection. Check for loose or damaged components. Pass Fail N/A Notes:
- [ ] Ensure that high-voltage areas are clearly marked with appropriate warning signs. Verify compliance with ANSI Z535 standards. Pass Fail N/A Notes:
- [ ] Verify that surge protection devices are installed to protect sensitive electronic equipment from voltage spikes. Check for proper grounding. Pass Fail N/A Notes:

Findings

#	Item	Location	Severity	Action required
1				
2				
3				
4				
5				
6				
7				
8				

Signature

Inspector signature _____ **Name** _____

Date _____