

**GENERAL RISK ASSESSMENT TEMPLATE**

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| **Work area / operation** | Denso Robot Vs, hamper packer operations | **Assessors name** | Alexander Perry, Thanh Tung Vu |
| **Other persons consulted** |  | **Date** | 28/09/2020 |

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| **ACTIVITY**  - Describe hazardous activities related to the work area or operation. | **ASSOCIATED HAZARDS** | **INHERENT RISK**  - Harm that could occur from these hazards if controls fail or are not in place. | **PROPOSED CONTROL MEASURES**  - Proposed action to minimise risk to an acceptable level. | **RESIDUAL RISK LEVEL** (H,M,L) |
| General activities in an area where other people and a robot are working | Working in an industrial setting | General injuries | * Restrict access to the area around the robot to those who have completed an induction/training | L |
| Working in the area around the robot  Working with the robot  Completing maintenance on the robot | Moving parts of the robot arm | General injuries  Damage to property, materials, or equipment | * Restrict access to the area around the robot * Guarding/barriers around the robots’ immediate work area * Redesign the workspace/workflow so that the area around the robot can be avoided as much as possible (i.e. move the robot to one side of the larger worker area so that workers can move around/do their required tasks without entering its area) * Install an emergency stop button which can be pressed to immediately stop robot operation | L |
| Completing maintenance on the robot | Electrical equipment | Electrocution injuries | * Test and tag electrical equipment | L |
| Operating robot in close proximity to external objects | Collisions, potential crush points, heat generated by overworked motors fighting one another in collision | Burn, motor burnout, lacerations, cuts and bruising low degree trauma | * Train user/people that are present and make aware the hazard and the risks of potential crush locations. Pre simulate the code in a safe environment such as MATLAB to ensure that the robot arms will carry out the correct motions. Run this in conjunction with a well-tested prerequisite test in simulation, to ensure the code will properly command the robot joint states correctly and check DH parameters are indeed correct | M |
| Commanding robots with code that has undergone minimal checks and testing. | Collision, potential crush point, heat generated by overworked motors, object thrown at speed. | Burns, motor burnout, lacerations, cuts and bruising low degree trauma. | * Pre simulate the code in a safe environment such as MATLAB to ensure that the robot arms will carry out the correct motions. | M |
| Moving furniture/objects to suit demonstration conditions | Lifting strain, awkward movements. | Muscle strain due to incorrect lifting procedures. | * Ensure all furniture is removed or well positioned prior to the demonstration day and ensure any furniture or objects required to be move are done correctly and with assistance if required. | L |

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| **Supervisor approval of assessment** | | I am satisfied that the residual risk with existing controls is acceptable ☐Yes ☐No  OR  I am satisfied that that the proposed controls will reduce risk to an acceptable level. ☐Yes ☐No | | | | |
| Supervisors Name | Gavin Paul | | Signature |  | Date |  |