Industrial Robotic System Integration

Unit Code: ASC/N8352

Version: 1.0

NSQF Level: 5.5

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Description

This NOS unit is about performing tasks related to, setup and installation of robots and commissioning.

Scope

The scope covers the following :

- Layout marking and positioning of components in the robotic cell.
- Perform robot installation and setup

Elements and Performance Criteria

Layout marking and positioning of components in the robotic cell

To be competent, the user/individual on the job must be able to:

PC1. determine area required for system implementation and availability of power, pneumatic and coolant supply

PC2. plan material space, trolleys, supply of material to line side & material handling equipment

PC3. find the position of equipment and finalize the robot positions according to it

PC4. finalize the required work tables of fixtures, orientation of loading and unloading and material flow in the robotic cell

PC5. mount and place all the components of robotic cell like robot, tip dressers, jigs/fixture/grippers, docking units, sensor and cable trays etc. as per the design document

Perform robot installation and commissioning

To be competent, the user/individual on the job must be able to:

PC6. install robot controller, licenses, tool, sensors and pneumatics into the system by following organisational procedures

PC7. integrate robot controller and robot as per SOP and design document

PC8. integrate safety fencing and controller panel as per SOP and design document

PC9. turn on the power of robot, do first operation, look for any warnings/errors in it and rectify the same as per organisational guidelines

PC10. check for sensors and external device connections with controller in case of any malfunction or no operation

PC11. fix the TCP and mount the frame on tool as per design and project document

PC12. create a trial program in robot.

PC13. carry out tool configuration and data mapping in the system as per SOP

PC14. test run to ensure communication between robot and connected machines (Power source in case of MIG welding)

PC15. check all safety interlocks and ensure all equipment are working.

PC16. create logic and sequence according to process flow and incorporate the sequence in final robot program.

PC17. run robot auto program with all safety interlocks and alarms.

PC18. perform dry-run of the robot to check its functioning.

PC19. optimise and validate all the parameters of the robot and associated equipment as per organisation guidelines.

Knowledge and Understanding (KU)

The individual on the job needs to know and understand:

KU1. organisation procedures for health, safety and security, individual role and responsibilities in this context

KU2. software and 3D tools used in organisation.

KU3. basics of electrical safety

KU4. safe operation of electronic equipment like computers and printers

KU5. data safety and non-discloser's norms

KU6. cyber safety and work confidentiality good practices

KU7. robot anatomy and Robot applications

KU8. EOAT anatomy and pneumatic systems

KU9. pay load requirements, reachability requirements and accuracy requirements

KU10. criteria and parameters for the selection of robot, EOAT and other accessories needed

KU11. procedure of designing and layouting of robotic cell and its positions

KU12. criteria for writing the new equipment specification manual

KU13. accuracy, speed and motion of robot

KU14. mechanism of linear and circular motion types

KU15. motion and time taken for different activity

Generic Skills (GS)

User/individual on the job needs to know how to:

GS1. follow instructions, guidelines, procedures, rules, and service level agreements

GS2. listen effectively and communicate information accurately

GS3. follow rule-based decision-making processes

GS4. make decisions on suitable courses

GS5. plan and organize the work to achieve targets and meet deadlines

GS6. apply problem-solving approaches to different situations

GS7. analyse the business impact and disseminate relevant information to others

GS8. apply balanced judgments to different situations

GS9. check the work is complete and free from errors

Assessment Criteria

Assessment Criteria for Outcomes	Theory Marks	Practical Marks	Project Marks	Viva Marks
Layout marking and positioning of components in the robotic cell	**11**	**11**	**-**	**7**
PC1. determine area required for system implementation and availability of power, pneumatic and coolant supply	2	1	-	1
PC2. plan material space, trolleys, supply of material to line side & material handling equipment	2	2	-	1
PC3. find the position of equipment and finalize the robot positions according to it	2	2	-	2
PC4. finalize the required work tables of fixtures, orientation of loading and unloading and material flow in the robotic cell	2	3	-	1
PC5. mount and place all the components of robotic cell like robot, tip dressers, jigs/fixture/grippers, docking units, sensor and cable trays etc. as per the design document	3	3	-	2
Perform robot installation and commissioning	**19**	**39**	**-**	**13**
PC6. install robot controller, licenses, tool, sensors and pneumatics into the system by following organisational procedures	2	3	-	1
PC7. integrate robot controller and robot as per SOP and design document	1	3	-	1
PC8. integrate safety fencing and controller panel as per SOP and design document	2	2	-	1
PC9. turn on the power of robot, do first operation, look for any warnings/errors in it and rectify the same as per organisational guidelines	1	2	-	1
PC10. check for sensors and external device connections with controller in case of any malfunction or no operation	1	2	-	1
PC11. fix the TCP and mount the frame on tool as per design and project document	2	4	-	1
PC12. create a trial program in robot.	2	4	-	1

Assessment Criteria for Outcomes	Theory Marks	Practical Marks	Project Marks	Viva Marks
PC13. carry out tool configuration and data mapping in the system as per SOP	1	3	-	1
PC14. test run to ensure communication between robot and connected machines (Power source in case of MIG welding)	1	2	-	1
PC15. check all safety interlocks and ensure all equipment are working.	2	4	-	1
PC16. create logic and sequence according to process flow and incorporate the sequence in final robot program.	1	3	-	1
PC17. run robot auto program with all safety interlocks and alarms.	1	3	-	1
PC18. perform dry-run of the robot to check its functioning.	1	2	-	-
PC19. optimise and validate all the parameters of the robot and associated equipment as per organisation guidelines.	1	2	-	1
NOS Total	**30**	**50**	**-**	**20**

National Occupational Standards (NOS) Parameters

NOS Code	ASC/N8352
NOS Name	Industrial Robotic System Integration
Sector	Automotive
Sub-Sector	Research & Development
Occupation	Automotive Product Development
NSQF Level	5.5
Credits	2
Minimum Educational Qualification & Experience	Certificate-NSQF (in Industrial Robotic System Planning, level 5.5)
Version	1.0
Next Review Date	NA
CCN Category	1