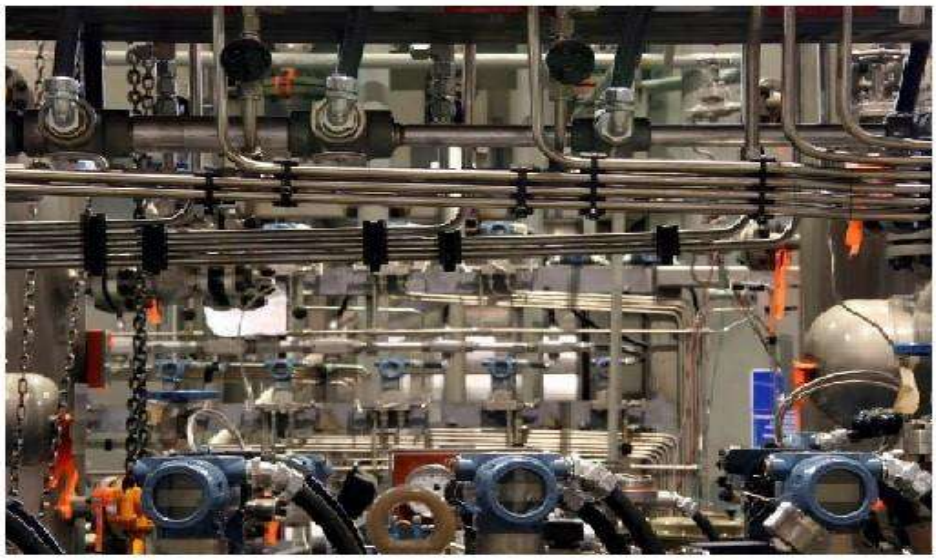

Instrumentation Technician (Process Control)

QP Code: IAS/Q3102

NSQF Level: 4

Instrumentation, Automation, Surveillance & Communication Sector Skill Council || IASC SSC, 201-202, STBP NSIC Complex, Okhla Industrial Estate, New Delhi 110020

Contents

IAS/Q3102: Instrumentation Technician (Process Control)

Brief Job Description

The Instrumentation Technician (Process Control) carries out duties related to operation, preventive maintenance and breakdown maintenance of instrumentation and control systems in process plants

Personal Attributes

This job requires the individual to be disciplined, assertive, team player, possess analytical skills and problem solving ability, effective communicator and have the ability to work for long hours and under pressure.

Applicable National Occupational Standards (NOS)

Compulsory NOS:

1. IAS/N3103: Maintain site readiness and instrument usability as applicable for process control industry
2. IAS/N3104: Perform process control preventive maintenance
3. IAS/N3106: Perform predictive, corrective and shutdown maintenance for process control
4. IAS/N3107: Perform installation of instruments and loop testing as per instructions
5. IAS/N3108: Perform process control reporting tasks
6. IAS/N9001: Work effectively with teams
7. IAS/N9002: Health and safety in workplace

Qualification Pack (QP) Parameters

Sector	Instrumentation
Sub-Sector	Instrumentation & Automation
Primary Occupation	Operation and Maintenance
Secondary Occupation	
Country	India
NSQF Level	4
Aligned to NCO/ISCO/ISIC Code	NCO-2015/7311.0101

Minimum Educational Qualification & Experience	12th Class (PCM subjects) OR I.T.I (Instrumentation/Electrical/Electronics)

Minimum Level of Education for Training in School	
Pre-Requisite License or Training	Basic and Advance Training course on Instrumentation, PLC and Control Loops and Maintenance (Preferable)
Minimum Job Entry Age	18 Years
Last Reviewed On	02/05/2019
Next Review Date	01/05/2023
NSQC Approval Date	22/08/2019
Version	1.0

IAS/N3103: Maintain site readiness and instrument usability as applicable for process control industry

Description

The OS unit is about maintaining general site readiness and instrument usability as applicable for process control industry

Scope

This unit/ task covers the following: Perform servicing and routine checks as instructed Identify and locate various equipment and devices Perform visual integrity checks of field installations Perform housekeeping and lighting related checks Monitor and maintain Consumables and perform follow-up

Elements and Performance Criteria

Follow plant working and instrumentation documents

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

PC1. read, interpret and follow the process plant related instructions and directives, including equipment required, location, lay out, procedures etc.

PC2. read, interpret and follow the the rules regarding various permits to work and use the right one depending on the job he/she undertakes.

PC3. make the check list consisting of site hygiene, calibration, preventive maintenance etc. and use it in instrumentation & maintenance work

PC4. verify and use the plant working and instrument document relevant to a particular Instrument tag/control loop being worked uponPlant working: Main process plants; package units such as boilers, heaters, compressors chillers etc.Instrument documents: P and I diagram; instrument index/data sheets/hook up diagram/loop diagram/instrument layout diagram/wiring diagrams/cause and effect diagram

Perform servicing and routine checks as instructed

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

PC5. check the maintenance requests for instruments connected with process control and resolve the problems as per instructionsInstruments connected with process control problem solving: Measurement sensors and associated impulse lines/sensor cables/Pneumatic/electronic transmitters etc.; Controllers and control room receivers/ Control valves and other final control elements etc.

PC6. perform basic overhaul and testing of process control equipment as per instructions. Instruments connected with process control for overhaul and testing: Control Valve accessories, Solenoid Valves, Fail safe shut down devices Pneumatic and Digital Valve positioners /Control Valve Data Sheet, control Valve characteristics /Overhaul, testing and calibration of Control Valves etc.

PC7. carry out routine checks of Analyzer sampling system/ Sensor and electronics section (liquid analyzers, Gas analyzers, Gas Chromatograph and accessories in Analyzer house/Calibration Gas cylinders storage and procedures etc.

Identify and locate various equipment and devices

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

PC8. check the field devices and identifies the interface units able to work on the system with guidance.

PC9. locate and identify faults in Package Units Boilers, Heaters, Compressors, Chillers etc. relating to operation of package units, location, etc.

PC10. undertake routines checks and perform basic trouble shooting in process package units.

PC11. locate and identify faults in the fire and gas field devices, identify interface units

PC12. perform maintenance work on the fire and gas system with guidance

Perform visual integrity checks of field installations

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

PC13. check for visible damage or wrong installation of specified field Instruments by various causes (in an inventory list otherwise provided by the Supervisor Various causes: prominent damage to accessories of the specified Instruments caused by impact of an external body; Check for water ingress in indoor working are a due to seepage/roof leaks /damaged windows; misuse of installation by other agencies for example, using instrumentals on a support or for scaffolding buildup; prominent deterioration due to environment for example, corrosion / proximity to hot surfaces / process leaks etc

PC14. check for improper closure of junction boxes, panels, cable termination/ tubing /impulse piping connection etc.

PC15. check for unauthorized /unexplained cable connection, disconnection/ process impulse lines / instrument air connection/disconnectio

PC16. check for potential electrical problems due to deviation from standard electrical practice

PC17. check for unused flood light/ field plug connections with trailing cable/ bare, untagged or uninsulated wires

PC18. check for any modifications or deviation in explosion proof closures and intrinsic safety installation

Perform housekeeping and lighting related checks

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

PC19. check for wet/slippery work areas, improper storage of items and cluttering of items on work areas. These are potential safety hazards

PC20. check for lighting and their operation. Check for unsafe temporary wiring of lighting

Monitor and maintain Consumables and perform follow-up

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

PC21. check for excessive consumption /visible wastage of cleaning solvents, lubrication oil and grease/related consumables such as waste cloth and gloves

PC22. check for proper storage of solvent and waste cloth (potential fire hazard).

PC23. perform follow-up action as per assigned areas of responsibility and stipulated instructions. Items found unusual outside this boundary to be reported to supervisor and obtain required approval/endorsement

Take actions to resolve areas of concern

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

PC24. prepare a list of problems identified

PC25. follow standard procedure and instruction manual to rectify the problems

PC26. report to supervisor that problems that could not be rectified promptly

Knowledge and Understanding (KU)

The individual on the job needs to know and understand:

KU1. the purpose of the process plant and its operations.

KU2. the layout of the plant and the location of various facilities.

KU3. the site conditions and how these impact the operation of instrumentation and control equipment.

KU4. the organization and reporting structure.

KU5. rules and regulations to be followed under normal and emergency conditions.

KU6. working hours, shifts, off days and leave entitlements.

KU7. the job description and responsibility, if any.

KU8. type of chemicals and other process material used in the organization and how these impact the site conditions.

KU9. hazardous chemicals and their handling procedures.

KU10. type of instruments and controllers used in the plant.

KU11. type of instruments, accessories and their locations that falls under the individuals domain of work.

KU12. how instrumentation is located using plant layout drawings.

KU13. how instrumentation maintenance is performed in the organization

Generic Skills (GS)

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

GS1. use formats and check list for site readiness planning and reports **GS2.** write emails and messages about site related issues.

GS3. read company policy related to site readiness.

GS4. read formats for site readiness check sheets, list.

GS5. describe condition of instruments and accessories and issues to co-workers and supervisor.

GS6. communicate to the management in meetings about site issues which need management attention.

GS7. interact with co-workers and gather information related to process and instruments conditions.

GS8. make decisions pertaining to the scope of work

GS9. make decisions about the site, in consultation with the supervisor

GS10. prioritize daily tasks to conduct site survey effectively

GS11. capture and real needs of the customer and suggest most appropriate solution.

GS12. support customer when they need help

GS13. diagnoses reasons for down time due to instrument failure.

GS14. track recurring failures in instruments for reasons and concludes.

GS15. identify immediate or temporary solutions to resolve delays and discuss with the supervisor **GS16.** use the existing information to optimize solution and company business.

GS17. analyze problems and identify causes and possible solutions

GS18. analyze and evaluate the information gathered from observation, experience, reasoning, or communication, as a guide to thought and action.

GS19. anticipate problems, risks and opportunities and utilize these for mitigation and business optimization

Assessment Criteria

Assessment Criteria for Outcomes	Theory Marks	Practical Marks	Project Marks	Viva Marks
Follow plant working and instrumentation documents	**9**	**9**	-	-
PC1. read, interpret and follow the process plant related instructions and directives, including equipment required, location, lay out, procedures etc.	2	2	-	-
PC2. read, interpret and follow the the rules regarding various permits to work and use the right one depending on the job he/she undertakes.	2	2	-	-
PC3. make the check list consisting of site hygiene, calibration, preventive maintenance etc. and use it in instrumentation & maintenance work	2	2	-	-
PC4. verify and use the plant working and instrument document relevant to a particular Instrument tag/control loop being worked uponPlant working: Main process plants; package units such as boilers, heaters, compressors chillers etc.Instrument documents: P and I diagram; instrument index/data sheets/hook up diagram/loop diagram/instrument layout diagram/wiring diagrams/cause and effect diagram	3	3	-	-
Perform servicing and routine checks as instructed	**9**	**9**	-	-
PC5. check the maintenance requests for instruments connected with process control and resolve the problems as per instructionsInstruments connected with process control problem solving: Measurement sensors and associated impulse lines/sensor cables/Pneumatic/electronic transmitters etc.; Controllers and control room receivers/ Control valves and other final control elements etc.	3	3	-	-
PC6. perform basic overhaul and testing of process control equipment as per instructions. Instruments connected with process control for overhaul and testing: Control Valve accessories, Solenoid Valves, Fail safe shut down devices Pneumatic and Digital Valve positioners /Control Valve Data Sheet, control Valve characteristics /Overhaul, testing and calibration of Control Valves etc.	3	3	-	-

Assessment Criteria for Outcomes	Theory Marks	Practical Marks	Project Marks	Viva Marks
PC7. carry out routine checks of Analyzer sampling system/ Sensor and electronics section (liquid analyzers, Gas analyzers, Gas Chromatograph and accessories in Analyzer house/Calibration Gas cylinders storage and procedures etc.	3	3	-	-
Identify and locate various equipment and devices	**10**	**10**	**-**	**-**
PC8. check the field devices and identifies the interface units able to work on the system with guidance.	2	2	-	-
PC9. locate and identify faults in Package Units Boilers, Heaters, Compressors, Chillers etc. relating to operation of package units, location, etc.	2	2	-	-
PC10. undertake routines checks and perform basic trouble shooting in process package units.	2	2	-	-
PC11. locate and identify faults in the fire and gas field devices, identify interface units	2	2	-	-
PC12. perform maintenance work on the fire and gas system with guidance	2	2	-	-
Perform visual integrity checks of field installations	**8**	**12**	**-**	**-**
PC13. check for visible damage or wrong installation of specified field Instruments by various causes (in an inventory list otherwise provided by the Supervisor Various causes: prominent damage to accessories of the specified Instruments caused by impact of an external body; Check for water ingress in indoor working are a due to seepage/roof leaks /damaged windows; misuse of installation by other agencies for example, using instrumentals on a support or for scaffolding buildup; prominent deterioration due to environment for example, corrosion / proximity to hot surfaces / process leaks etc	2	2	-	-
PC14. check for improper closure of junction boxes, panels, cable termination/ tubing /impulse piping connection etc.	2	2	-	-
PC15. check for unauthorized /unexplained cable connection, disconnection/ process impulse lines / instrument air connection/disconnectio	1	2	-	-

Assessment Criteria for Outcomes	Theory Marks	Practical Marks	Project Marks	Viva Marks
PC16. check for potential electrical problems due to deviation from standard electrical practice	1	2	-	-
PC17. check for unused flood light/ field plug connections with trailing cable/ bare, untagged or uninsulated wires	1	2	-	-
PC18. check for any modifications or deviation in explosion proof closures and intrinsic safety installation	1	2	-	-
Perform housekeeping and lighting related checks	**2**	**4**	-	-
PC19. check for wet/slippery work areas, improper storage of items and cluttering of items on work areas. These are potential safety hazards	1	2	-	-
PC20. check for lighting and their operation. Check for unsafe temporary wiring of lighting	1	2	-	-
Monitor and maintain Consumables and perform followup	**3**	**6**	-	-
PC21. check for excessive consumption /visible wastage of cleaning solvents, lubrication oil and grease/related consumables such as waste cloth and gloves	1	2	-	-
PC22. check for proper storage of solvent and waste cloth (potential fire hazard).	1	2	-	-
PC23. perform follow-up action as per assigned areas of responsibility and stipulated instructions. Items found unusual outside this boundary to be reported to supervisor and obtain required approval/endorsement	1	2	-	-
Take actions to resolve areas of concern	**3**	**6**	-	-
PC24. prepare a list of problems identified	1	2	-	-
PC25. follow standard procedure and instruction manual to rectify the problems	1	2	-	-
PC26. report to supervisor that problems that could not be rectified promptly	1	2	-	-

NOS Total	**44**	**56**	-	-

National Occupational Standards (NOS) Parameters

NOS Code	IAS/N3103
NOS Name	Maintain site readiness and instrument usability as applicable for process control industry
Sector	Instrumentation
Sub-Sector	Instrumentation & Automation
Primary Occupation	Operation and Maintenance
Secondary Occupation	
NSQF Level	4
Credits	TBD
Version	1.0
Last Reviewed Date	02/05/2019
Next Review Date	01/05/2023
NSQC Clearance Date	22/08/2019

IAS/N3104: Perform process control preventive maintenance

Description

The OS unit is about performing preventive maintenance for general instrumentation in process controls under guidance.

Scope

This unit/task covers the following:

- Organize PM preparatory tasks
- Plan and execute PM schedule
- Perform PM visual checks & actions

Elements and Performance Criteria

Organize PM preparatory tasks

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

PC1. obtain work permit (mandatory) from the Process supervisor before commencing maintenance work.

PC2. perform the days preventive maintenance tasks and report Preventive maintenance tasks: Check sheets and related documents; check tools and tackles and calibrating equipment; wear personal protective safety equipment.

Plan and execute PM Schedule

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

PC3. prepare Preventive maintenance Process list as per instructions from process supervisor.

PC4. prepare plan for next days preventive maintenance schedule.

PC5. perform Preventive maintenance jobs as per available Preventive Maintenance Schedule.

PC6. check preventive maintenance schedule list of Field Instrumentation and controls to ensure that all jobs listed in schedule are completed

Perform PM visual checks & actions

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

PC7. perform the Visual Checks & takes corrective actions wherever possible or else transfer job to shut down list

PC8. check for abnormal vibration locates source- corrects /informs supervisor

PC9. check for gland leak /instrument air leaks/ control valve bonnet and body flange leaks and report to Process supervisor& Instrument supervisor.

PC10. check pneumatic and electric connections to solenoid valve/pneumatic connections in Pneumatic transmitters etc. and rectifies fault after informing process supervisor

PC11. prepare and consolidate daily-diagnostic messages from control valves and record the same in either Preventive Maintenance list or opportunistic shut down list for execution.

PC12. perform preventive maintenance jobs during annual shut down or opportunistic shut down list.

Knowledge and Understanding (KU)

The individual on the job needs to know and understand:

KU1. preventive Maintenance norms as defined by the company

KU2. production targets and production loss figures for the month and contribution by control valves

KU3. aware of Maintenance Policy of the company with respect to control valve maintenance strategy

KU4. trouble Shooting of Control valve body including valve movement and glands

KU5. trouble Shooting of Actuator section and valve positioners and diagnostic messages from Digital Valve controller

KU6. trouble Shooting of Control valve accessories

KU7. trouble Shooting of Solenoid valve and Limit switches **KU8.** hazardous area zone classification and process media hazards.

KU9. use of Control Valve Manual when required. **KU10.** PST, a feature of DCS

Generic Skills (GS)

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

GS1. use formats and check list for site readiness planning and reports **GS2.** write emails and messages about site related issues.

GS3. read company policy related to preventive maintenance

GS4. read monthly down time and resulting production loss

GS5. use of work permit system

GS6. read formats for preventive maintenance check sheets, predictive maintenance list

GS7. describe condition of control valves and accessories and issues to coworkers and supervisor

GS8. communicate to the management in meetings about maintenance issues which need management attention

GS9. interact with co-workers and gather information related to process and control valve conditions

GS10. make decisions about timing and extent of preventive maintenance, in consultation with the supervisor

GS11. prioritize daily tasks to conduct preventive maintenance effectively

GS12. capture real needs of the customer and suggest most appropriate solution

GS13. support customer when they need help

GS14. diagnoses reasons for down time due to control valve failure

GS15. track recurring failures in control valves and analyses reasons and concludes

GS16. identify immediate or temporary solutions to resolve delays and discuss with the supervisor **GS17.** use the existing information to optimize solution and company business.

GS18. analyze problems and identify causes and possible solutions

GS19. analyze, and evaluate the information gathered from observation, experience, reasoning, or communication, as a guide to thought and action

GS20. anticipate problems, risks and opportunities and utilize these for mitigation and business optimization

Assessment Criteria

Assessment Criteria for Outcomes	Theory Marks	Practical Marks	Project Marks	Viva Marks
Organize PM preparatory tasks	**10**	**10**	-	-
PC1. obtain work permit (mandatory) from the Process supervisor before commencing maintenance work.	5	5	-	-
PC2. perform the days preventive maintenance tasks and report Preventive maintenance tasks: Check sheets and related documents; check tools and tackles and calibrating equipment; wear personal protective safety equipment.	5	5	-	-
Plan and execute PM Schedule	**16**	**16**	-	-
PC3. prepare Preventive maintenance Process list as per instructions from process supervisor.	4	4	-	-
PC4. prepare plan for next days preventive maintenance schedule.	4	4	-	-
PC5. perform Preventive maintenance jobs as per available Preventive Maintenance Schedule.	4	4	-	-
PC6. check preventive maintenance schedule list of Field Instrumentation and controls to ensure that all jobs listed in schedule are completed	4	4	-	-
Perform PM visual checks & actions	**24**	**24**	-	-
PC7. perform the Visual Checks & takes corrective actions wherever possible or else transfer job to shut down list	4	4	-	-
PC8. check for abnormal vibration locates sourcecorrects /informs supervisor	4	4	-	-
PC9. check for gland leak /instrument air leaks/ control valve bonnet and body flange leaks and report to Process supervisor& Instrument supervisor.	4	4	-	-
PC10. check pneumatic and electric connections to solenoid valve/pneumatic connections in Pneumatic transmitters etc. and rectifies fault after informing process supervisor	4	4	-	-

Assessment Criteria for Outcomes	Theory Marks	Practical Marks	Project Marks	Viva Marks
PC11. prepare and consolidate daily-diagnostic messages from control valves and record the same in either Preventive Maintenance list or opportunistic shut down list for execution.	4	4	-	-
PC12. perform preventive maintenance jobs during annual shut down or opportunistic shut down list.	4	4	-	-
NOS Total	**50**	**50**	**-**	**-**

National Occupational Standards (NOS) Parameters

NOS Code	IAS/N3104
NOS Name	Perform process control preventive maintenance
Sector	Instrumentation
Sub-Sector	Instrumentation & Automation
Primary Occupation	Operation and Maintenance
Secondary Occupation	
NSQF Level	4
Credits	TBD
Version	1.0
Last Reviewed Date	02/05/2019
Next Review Date	01/05/2023
NSQC Clearance Date	22/08/2019

IAS/N3106: Perform predictive, corrective and shutdown maintenance for process control

Description

The OS unit is about performing predictive, corrective and shutdown maintenance for process control instrumentation.

Scope

This unit/task covers the following: Prepare Predictive Maintenance Plan and Include in schedule Prepare / Follow Corrective Maintenance Plan and Schedule Identify Corrective Maintenance Needs and Spares Execute Corrective Maintenance Schedule Support Shutdown Maintenance and Overhaul Complete Corrective Maintenance Check List / Report and Close CM fault list Brief Supervisor on Corrective Maintenance

Elements and Performance Criteria

Prepare Predictive Maintenance Plan and Include in schedule

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

PC1. check and analyze the observations of preventive maintenance visits for any recurrent issues or behavior which points to a possible problem or failure in near future

PC2. check and Identify items (instruments, control elements, cabling and other accessories) which are in conditions that need repair or replacement

PC3. prepare a list and discuss with the engineer or supervisor and identify items that need maintenance/replacement

PC4. check and identify the items needs for corrective maintenance and incorporate in list along with the schedule

Prepare / Follow Corrective Maintenance Plan and Schedule

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

PC5. prepare corrective maintenance plan from the identified needs.

PC6. prepare the schedule for execution of corrective maintenance list

Identify Corrective Maintenance Needs and Spares

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

PC7. check and analyze the observations, reports and behavior of the field instruments and Identify needs for corrective maintenance in the plant. Create Corrective Maintenance List.

PC8. check and identify spares required for corrective maintenance and prepare list

PC9. ensure the availability of spares and Share the list with the designated persons

Execute Corrective Maintenance Schedule

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

PC10. carry out maintenance of items in the Corrective maintenance list

PC11. obtain work permit from the process supervisor before commencing maintenance work

PC12. check and identify necessary documents and equipment: Documents and equipment: Check sheets and related documents; tools, tackles and calibrating equipment; spares parts, complete instruments/assemblies and consumables; required for corrective maintenance; personal protective safety equipment;

PC13. perform adjustment/ calibration/part replacement/ instrument replacement as specified

Support Shutdown Maintenance and Overhaul

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

PC14. perform corrective maintenance jobs during annual shut down or opportunistic shut down list.

PC15. perform requested services relating to instruments, controllers, field wiring, calibration, testing and adjustments during shutdown and overhaul.

PC16. check with other departments (such as cranes, workshop and process operations, mechanical, electrical, central stores) to complete extremely time critical activities and support start up.

Complete Corrective Maintenance Check List / Report and Close CM fault list To be competent, the user/individual on the job must be able to:

PC17. ensure entry of corrective maintenance check lists and prepare reports.

PC18. perform all faults reported

PC19. perform corrective maintenance schedule list of Field Instrumentation and controls. Close the list.

Brief Supervisor on Corrective Maintenance

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

PC20. report supervisor about corrective maintenance performed.

PC21. report to supervisor about Faults / issues if any.

Knowledge and Understanding (KU)

The individual on the job needs to know and understand:

KU1. PM, CM and PRM norms of the company.

KU2. the impact of CM on productivity and the importance of avoiding delays/production loss

KU3. how to prioritize and synchronize the timing for corrective maintenance work. during Opportunistic shut downs /annual shut down.

KU4. production targets and production loss figures for the month and contribution by instruments and control valves.

KU5. the critical role of inter personal skills during shut down activities due to strict time line for completion and start-up. Extensive coordination with multiple departments is needed (such asCranes, Workshop and Process operations, Mechanical, Electrical, Central stores).

KU6. possesses functional knowledge of all types of instrumentation and control hardware in the plant

KU7. how to use the right instrumentation documentation for maintenance **KU8.**

critical control loops associated with various emergency shut down systems **KU9.**

how to use calibrators, associated test equipment and test pumps.

KU10. importance of material of construction of sensing elements and control valves in process media

KU11. vendor manuals, drawings and documents including:a) P & I Diagramb) Hook up & Loop Diagramsc) Layout diagramsd) Instrument liste) Circuit diagram

KU12. critical control loops associated with various Emergency Shut Down systems (ESD).

KU13. trouble shooting of: Control valve body including valve movement and glands. Actuator section and valve positioners and diagnostic messages from Digital Valve controller Control valve accessories Solenoid valve and Limit switches

KU14. hazardous area zone classification and process media hazards.

KU15. use of control valve manual when required.

KU16. partial stroke test of control valve (PST), a feature of DCS.

Generic Skills (GS)

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

GS1. use formats and check list for site readiness planning and reports.

GS2. write emails and messages about site related issues **GS3.**

company policy related to preventive maintenance.

GS4. monthly down time and resulting production loss.

GS5. use of work permit system.

GS6. formats for preventive maintenance check sheets, predictive maintenance list.

GS7. describe condition of field instruments and control valves and accessories and issues to coworkers and supervisor.

GS8. communicate to the management in meetings about maintenance issues which need management attention

GS9. interact with co-workers and gather information related to process and control valve conditions

GS10. make decisions about timing and extent of preventive maintenance, in consultation with the supervisor

GS11. prioritize daily tasks to conduct preventive maintenance effectively

GS12. capture real needs of the customer and suggest most appropriate solution

GS13. support customer when they need help

GS14. diagnoses reasons for down time due to control valve failure

GS15. track recurring failures in field instruments, control valves and analyses reasons and concludes

GS16. identify immediate or temporary solutions to resolve delays and discuss with the supervisor

GS17. use the existing information to optimize solution and company business

GS18. analyze problems and identify causes and possible solutions

GS19. analyze, and evaluate the information gathered from observation, experience, reasoning, or communication, as a guide to thought and action

GS20. anticipate problems, risks and opportunities and utilize these for mitigation and business optimization

Assessment Criteria

Assessment Criteria for Outcomes	Theory Marks	Practical Marks	Project Marks	Viva Marks
Prepare Predictive Maintenance Plan and Include in schedule	**8**	**12**	-	-
PC1. check and analyze the observations of preventive maintenance visits for any recurrent issues or behavior which points to a possible problem or failure in near future	2	3	-	-
PC2. check and Identify items (instruments, control elements, cabling and other accessories) which are in conditions that need repair or replacement	2	3	-	-
PC3. prepare a list and discuss with the engineer or supervisor and identify items that need maintenance/replacement	2	3	-	-
PC4. check and identify the items needs for corrective maintenance and incorporate in list along with the schedule	2	3	-	-
Prepare / Follow Corrective Maintenance Plan and Schedule	**4**	**6**	-	-
PC5. prepare corrective maintenance plan from the identified needs.	2	3	-	-
PC6. prepare the schedule for execution of corrective maintenance list	2	3	-	-

Identify Corrective Maintenance Needs and Spares	**6**	**9**	-	-
PC7. check and analyze the observations, reports and behavior of the field instruments and Identify needs for corrective maintenance in the plant. Create Corrective Maintenance List.	2	3	-	-
PC8. check and identify spares required for corrective maintenance and prepare list	2	3	-	-
PC9. ensure the availability of spares and Share the list with the designated persons	2	3	-	-
Execute Corrective Maintenance Schedule	**8**	**12**	-	-
PC10. carry out maintenance of items in the Corrective maintenance list	2	3	-	-

Assessment Criteria for Outcomes	Theory Marks	Practical Marks	Project Marks	Viva Marks
PC11. obtain work permit from the process supervisor before commencing maintenance work	2	3	-	-
PC12. check and identify necessary documents and equipment: Documents and equipment: Check sheets and related documents; tools, tackles and calibrating equipment; spares parts, complete instruments/assemblies and consumables; required for corrective maintenance; personal protective safety equipment;	2	3	-	-
PC13. perform adjustment/ calibration/part replacement/ instrument replacement as specified	2	3	-	-
Support Shutdown Maintenance and Overhaul	**6**	**9**	-	-
PC14. perform corrective maintenance jobs during annual shut down or opportunistic shut down list.	2	3	-	-
PC15. perform requested services relating to instruments, controllers, field wiring, calibration, testing and adjustments during shutdown and overhaul.	2	3	-	-

PC16. check with other departments (such as cranes, workshop and process operations, mechanical, electrical, central stores) to complete extremely time critical activities and support start up.	2	3	-	-
Complete Corrective Maintenance Check List / Report and Close CM fault list	**6**	**6**	-	-
PC17. ensure entry of corrective maintenance check lists and prepare reports.	2	2	-	-
PC18. perform all faults reported	2	2	-	-
PC19. perform corrective maintenance schedule list of Field Instrumentation and controls. Close the list.	2	2	-	-
Brief Supervisor on Corrective Maintenance	**4**	**4**	-	-
PC20. report supervisor about corrective maintenance performed.	2	2	-	-
PC21. report to supervisor about Faults / issues if any.	2	2	-	-

Assessment Criteria for Outcomes	Theory Marks	Practical Marks	Project Marks	Viva Marks
NOS Total	**42**	**58**	-	-

National Occupational Standards (NOS) Parameters

NOS Code	IAS/N3106
NOS Name	Perform predictive, corrective and shutdown maintenance for process control
Sector	Instrumentation
Sub-Sector	Instrumentation & Automation
Primary Occupation	Operation and Maintenance
Secondary Occupation	
NSQF Level	4
Credits	TBD
Version	1.0
Last Reviewed Date	02/05/2019
Next Review Date	01/05/2023
NSQC Clearance Date	22/08/2019

IAS/N3107: Perform installation of instruments and loop testing as per instructions

Description

The OS unit is about installing instruments and performing loop testing under the guidance of the process engineer and instrumentation engineer. generally done before the plant start-up or after any major upgrade or overhaul.

Scope

This unit/task covers the following:

- Obtaining appropriate work permit
- Installation of instruments
- Organizing loop testing preparatory tasks
- Performing Loop Test
- Performing rework and verifying the loop

Elements and Performance Criteria

Obtaining appropriate work permit

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

PC1. obtain work permit of the right kind from the process supervisor before commencing work *Installation of instruments*

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

PC2. verify for each loop listed for Loop Test, perform operational check of the field instrument, controller and HMI elements etc.

PC3. ensure the continuity test of signal from the instruments to the control panel namely PLC, DCS, ESD or any other logical system

PC4. ensure that the field instrument is calibrated according to specifications.

PC5. ensure that the field instrument is properly connected to PLC, DCS or any other system.

PC6. check the logic in the DCS is ranged according to the field instruments and engineering units

PC7. ensure the range of calibration, alarms, set points and any signal included in the loop folder

PC8. ensure the testing of DCS signal from/to all instruments and actuators using appropriate signal generator such as HART communicator, temperature generator or 4-20mA generator, depending instrument type.

PC9. ensure testing ESD operation with specified tools to generate the required pressure, level or other parameter

PC10. ensure the testing of Loops for different type of control action such as direct, reverse, split range etc and record all data in the loop folder

PC11. check the signal from the field instrument is received by the control algorithm and the appropriate corrective output signal is generated and received by the final control element. **PC12.** perform the calibration of field control device according to specifications **PC13.** prepare the Loop Test report as defined in the SOP.

Organizing loop testing preparatory tasks

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

PC14. identify the scope and the plan of the Loop Testing as per Loop test list

PC15. co-ordinate with the team working at the end with PLC/DCS/other system, as per the loop testing procedure

PC16. ensure availability of installation drawings, documents, specifications, along with the tag numbers, configurations and other details needed for loop test

PC17. ensure availability of the instruments, calibrating equipments and accessories, needed for the loop test

Performing Loop Test

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

PC18. check the list of corrections required to be carried out.

PC19. identify the type of correction needed adjustment, refitting, cleaning, overhaul, recalibration, wiring change, replacement

PC20. perform the desired action and verify the performance of the device and maintain records **PC21.** ensure drawings/circuits incorporate changes during rework as per SOP.

Performing rework and verifying the loop

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

PC22. check the list of corrections required to be carried out.

PC23. identify the type of correction needed adjustment, refitting, cleaning, overhaul, recalibration, wiring change, replacement or any other action.

PC24. perform the desired action and verify the performance of the device and maintain records **PC25.** ensure drawings/circuits incorporate changes during rework as per SOP.

Knowledge and Understanding (KU)

The individual on the job needs to know and understand:

KU1. verify the Installation policies and norms as defined by the company
KU2. loop Testing policies and norms as defined by the company
KU3. types and specifications for Instruments used in the process plant.
KU4. installation procedures for instruments used in the process plant
KU5. calibration procedures for instruments used in the process plant.
KU6. trouble shooting of instruments used in the process plant
KU7. types and specifications for control elements used in the process plant **KU8.** tools and equipment used for installation and calibration.
KU9. installation procedures for control elements used in the process plant.
KU10. calibration procedures for control elements used in the process plant.
KU11. trouble shooting of control elements used in the process plant **KU12.** loop testing procedure defined for the process plant.
KU13. hazardous area zone classification and process media hazards
KU14. safety norms for installation and testing

Generic Skills (GS)

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

GS1. use formats and check list for installation planning and reports
GS2. formats and check list for loop test planning and reports
GS3. write emails and messages about site related issues
GS4. specifications, documents, drawings, lists, formats for instrument installation and testing and reporting
GS5. specifications, documents, drawings, lists, formats for loop testing
GS6. describe clearly the condition, values, settings and other details of instruments and accessories and issues to members of loop testing team
GS7. follow the instructions passed on by the members of loop testing team
GS8. communicate to the management in meetings about technical issues which need management attention.
GS9. interact with co-workers and gather information related to conditions of the instruments and process
GS10. make decisions about the proper functioning of instruments and sharing the information with co-workers
GS11. plan and prioritize installation work effectively
GS12. plan and prioritize loop testing work effectively.
GS13. capture real needs of the other teams (who request services) and suggest most appropriate solution.
GS14. support other teams when they need help.
GS15. diagnoses reasons for down time due to instrument malfunction or failure
GS16. track recurring failures in instrument and analyses reasons and concludes
GS17. identify immediate or temporary solutions to resolve delays and discuss with the supervisor

GS18. use the existing information to optimize solution and company business

GS19. analyze problems and identify causes and possible solutions

GS20. analyze, and evaluate the information gathered from observation, experience, reasoning, or communication, as a guide to thought and action

GS21. anticipate problems, risks and opportunities and utilize these for mitigation and business optimization

Assessment Criteria

Assessment Criteria for Outcomes	Theory Marks	Practical Marks	Project Marks	Viva Marks
Obtaining appropriate work permit	**2**	**3**	-	-
PC1. obtain work permit of the right kind from the process supervisor before commencing work	2	3	-	-
Installation of instruments	**24**	**36**	-	-
PC2. verify for each loop listed for Loop Test, perform operational check of the field instrument, controller and HMI elements etc.	2	3	-	-
PC3. ensure the continuity test of signal from the instruments to the control panel namely PLC, DCS, ESD or any other logical system	2	3	-	-
PC4. ensure that the field instrument is calibrated according to specifications.	2	3	-	-
PC5. ensure that the field instrument is properly connected to PLC, DCS or any other system.	2	3	-	-
PC6. check the logic in the DCS is ranged according to the field instruments and engineering units	2	3	-	-
PC7. ensure the range of calibration, alarms, set points and any signal included in the loop folder	2	3	-	-
PC8. ensure the testing of DCS signal from/to all instruments and actuators using appropriate signal generator such as HART communicator, temperature generator or 4-20mA generator, depending instrument type.	2	3	-	-
PC9. ensure testing ESD operation with specified tools to generate the required pressure, level or other parameter	2	3	-	-

PC10. ensure the testing of Loops for different type of control action such as direct, reverse, split range etc and record all data in the loop folder	2	3	-	-
PC11. check the signal from the field instrument is received by the control algorithm and the appropriate corrective output signal is generated and received by the final control element.	2	3	-	-

Assessment Criteria for Outcomes	Theory Marks	Practical Marks	Project Marks	Viva Marks
PC12. perform the calibration of field control device according to specifications	2	3	-	-
PC13. prepare the Loop Test report as defined in the SOP.	2	3	-	-
Organizing loop testing preparatory tasks	**8**	**9**	-	-
PC14. identify the scope and the plan of the Loop Testing as per Loop test list	2	3	-	-
PC15. co-ordinate with the team working at the end with PLC/DCS/other system, as per the loop testing procedure	2	2	-	-
PC16. ensure availability of installation drawings, documents, specifications, along with the tag numbers, configurations and other details needed for loop test	2	2	-	-
PC17. ensure availability of the instruments, calibrating equipments and accessories, needed for the loop test	2	2	-	-
Performing Loop Test	**5**	**4**	-	-
PC18. check the list of corrections required to be carried out.	1	1	-	-
PC19. identify the type of correction needed adjustment, refitting, cleaning, overhaul, recalibration, wiring change, replacement	1	1	-	-
PC20. perform the desired action and verify the performance of the device and maintain records	1	1	-	-

PC21. ensure drawings/circuits incorporate changes during rework as per SOP.	2	1	-	-
Performing rework and verifying the loop	**5**	**4**	-	-
PC22. check the list of corrections required to be carried out.	1	1	-	-
PC23. identify the type of correction needed adjustment, refitting, cleaning, overhaul, recalibration, wiring change, replacement or any other action.	1	1	-	-

Assessment Criteria for Outcomes	Theory Marks	Practical Marks	Project Marks	Viva Marks
PC24. perform the desired action and verify the performance of the device and maintain records	1	1	-	-
PC25. ensure drawings/circuits incorporate changes during rework as per SOP.	2	1	-	-
NOS Total	**44**	**56**	-	-

National Occupational Standards (NOS) Parameters

NOS Code	IAS/N3107
NOS Name	Perform installation of instruments and loop testing as per instructions
Sector	Instrumentation
Sub-Sector	Instrumentation & Automation
Primary Occupation	Operation and Maintenance
Secondary Occupation	
NSQF Level	4
Credits	TBD
Version	1.0
Last Reviewed Date	02/05/2019
Next Review Date	01/05/2023
NSQC Clearance Date	22/08/2019

IAS/N3108: Perform process control reporting tasks

Description

The OS unit is about reporting and record keeping as per company processes and job description for Instrumentation Technicians

Scope

This unit/task covers the following:

- Perform process control reporting tasks

Elements and Performance Criteria

Perform process control reporting tasks

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

PC1. report the faults/issues to immediate supervisor

PC2. ensure complete entry of preventive maintenance check lists/reports

PC3. ensure complete entry of corrective maintenance check lists /reports

PC4. report on noticing of any visible changes in control valve installation or its accessories. report for immediate attention of supervisor

PC5. report any theft in control valve assembly/spares to supervisor

PC6. report suspicious movement of new persons near control valve installation to security and supervisor

Knowledge and Understanding (KU)

The individual on the job needs to know and understand:

KU1. basic company policy and maintenance strategy as applied to control valves.

KU2. importance of reporting potential failures during site readiness visits / preventive maintenance checks/observation to supervisor

KU3. accurate time for jobs undertaken especially during opportunistic/annual shut down to supervisor.

KU4. status on critical spares consumption so that supervisor can take proactive steps **KU5.** prepare daily log and failure reports.

KU6. furnish basic data to supervisor related to specification of control valve **KU7.** send internal mails related to PM or corrective maintenance to supervisor **KU8.** record maintenance history.

Generic Skills (GS)

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

GS1. write mails about work

GS2. write reports and logs in company prescribed formats

GS3. make notes about the observations in the plant and share with the supervisor and coworkers as appropriate

GS4. write to management about feedback and unresolved issues

GS5. read and comprehend formats and check lists for preventive and corrective maintenance

GS6. read and understand company policies

GS7. communicate the issues / faults / corrective actions / warnings / suggestions

GS8. with complete details to the supervisor and co-workers as appropriate

GS9. make decisions on a suitable course of action or response keeping in view resource utilization while meeting commitments

GS10. prioritize jobs during multiple breakdown situations.

GS11. plan and organize work to achieve targets and deadlines

GS12. capture reel needs of the customer and suggest most appropriate solution

GS13. support customer when they need help

GS14. can diagnose control valve faults and communicate effectively to process and instrumentation supervisor.

GS15. use the existing information to arrive at actionable decision points.

GS16. use the existing information for improving the customer satisfaction.

GS17. use the existing information to optimize solution and company business.

GS18. analyze problems and identify causes and possible solutions

GS19. analyze, and evaluate the information gathered from observation, experience, reasoning, or communication, as a guide to thought and action

GS20. anticipate problems, risks and opportunities and utilize these for mitigation and business optimization

Assessment Criteria

Assessment Criteria for Outcomes	Theory Marks	Practical Marks	Project Marks	Viva Marks
Perform process control reporting tasks	**30**	**30**	**-**	**-**
PC1. report the faults/issues to immediate supervisor	5	5	-	-
PC2. ensure complete entry of preventive maintenance check lists/reports	5	5	-	-
PC3. ensure complete entry of corrective maintenance check lists /reports	5	5	-	-
PC4. report on noticing of any visible changes in control valve installation or its accessories. report for immediate attention of supervisor	5	5	-	-
PC5. report any theft in control valve assembly/spares to supervisor	5	5	-	-
PC6. report suspicious movement of new persons near control valve installation to security and supervisor	5	5	-	-
NOS Total	**30**	**30**	**-**	**-**

National Occupational Standards (NOS) Parameters

NOS Code	IAS/N3108
NOS Name	Perform process control reporting tasks
Sector	Instrumentation
Sub-Sector	Instrumentation & Automation
Primary Occupation	Operation and Maintenance
Secondary Occupation	
NSQF Level	4
Credits	TBD
Version	1.0
Last Reviewed Date	02/05/2019

Next Review Date	01/05/2023
NSQC Clearance Date	22/08/2019

IAS/N9001: Work effectively with teams

Description

This NOS unit is about building relationships and working with people and groups inside and outside the organization, using skills and habits, to achieve the team goals and objectives.

Scope

This unit/task covers the following: Creating team environment Communicating giving and receiving Working cooperatively Participating in team decision making Demonstrating Sense of Responsibility Showing respect for opinions, customs and preferences

Elements and Performance Criteria

Create Team Environment

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

PC1. know and understand the team objectives and goals

PC2. know team members by name. Greet them appropriately and respond to their greetings.

PC3. know the roles and responsibilities of team members. Ensure others know about you and your role in the team

PC4. learn about the culture and preferences of team members especially if they belong to other organizations or nationalities

PC5. follow organizations policies and procedures for working with team members within and outside the organization especially relating to privacy, confidentiality and security.

PC6. create an environment of trust and mutual respect

Communicate Give and Receive

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

PC7. use appropriate mode of communication verbal, written, mail, phone or text and clearly articulate your message to ensure that the recipient understands the message

PC8. listen to team members and try to understand what they are wanting to say. Seek or provide clarifications if you see any gap in understanding

PC9. communicate professionally and follow organization protocols. Do not overload the team members with unnecessary and unsolicited information **PC10.** share important information with the team timely.

PC11. respond to communications promptly.

Work Cooperatively

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

PC12. perform own role and produce output in time for other team members to consume

PC13. receive inputs from others and work upon it per role requirement

PC14. make adjustments within the permissible rules so that work flows smoothly

PC15. help team members to perform their role effectively and provide any clarifications and support they need

PC16. share tools and common resources fairly, taking cognizance of others needs and schedules **PC17.** resolve any contentious issues amicably, involving the team lead or the supervisor if needed

PC18. let team members know in good time if you cannot carry out your commitments, explaining the reasons and alternate solutions, if any. Let the team lead know about this.

Participate in Team Decision making

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

PC19. think positively and make constructive suggestions to meet the goals

PC20. accept and give suggestions with open mind

PC21. take initiatives and volunteer to contribute

PC22. help team members with facts and figures to arrive at workable decisions

PC23. accept decisions professionally and support these, even if these do not match your suggestions and personal views

Demonstrate Sense of Responsibility

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

PC24. act in the interest of the team and the organization to ensure that things do not fall through the gap and team goals are achieved.

PC25. take initiative to correct the situation if something seems to be going wrong

PC26. seek help or escalate if the situation demands

Show Respect for Opinions, Customs and Preferences

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

PC27. follow organizations and statutory guidelines about making references or comments to social customs or preferences

PC28. refrain from making any comments to hurt sentiments

PC29. accommodate team members preferences to the extent feasible. If these come in the way of fulfilling team goals, discuss with the supervisor/ team leader

PC30. seek information and clarifications from others if you do not understand any customs

Knowledge and Understanding (KU)

The individual on the job needs to know and understand:

KU1. the organizations policies and procedures for working with colleagues, roles and responsibilities in relation to this

KU2. the importance of effective communication and establishing good working relationships with colleagues

KU3. different methods of communication and the circumstances in which it is appropriate to use these

KU4. the importance of creating an environment of trust and mutual respect

KU5. the implications of own work on the work and schedule of others

KU6. different types of information that colleagues might need and the importance of providing this information when it is required

KU7. the importance of helping colleagues with problems, in order to meet quality and time standards as a team

Generic Skills (GS)

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

GS1. complete written work with attention to detail

GS2. read instructions, guidelines/procedures

GS3. listen effectively and orally communicate information

GS4. ask for clarification and advice from the concerned person

GS5. make decisions on a suitable course of action or response keeping in view resource utilization while meeting commitments

GS6. plan and organize work to achieve targets and deadlines

GS7. understand real needs of the customer and suggest most appropriate solution

GS8. support customer when they need help

GS9. apply problem solving approaches in different situations

GS10. use the existing information to arrive at actionable decision points

GS11. use the existing information for improving the customer satisfaction

GS12. use the existing information to optimize solution and company business

GS13. analyze problems and identify causes and possible solutions

GS14. apply balanced judgments to different situations

Assessment Criteria

Assessment Criteria for Outcomes	Theory Marks	Practical Marks	Project Marks	Viva Marks
Create Team Environment	**6**	**11**	-	-
PC1. know and understand the team objectives and goals	1	2	-	-
PC2. know team members by name. Greet them appropriately and respond to their greetings.	1	1	-	-
PC3. know the roles and responsibilities of team members. Ensure others know about you and your role in the team	1	1	-	-
PC4. learn about the culture and preferences of team members especially if they belong to other organizations or nationalities	1	4	-	-
PC5. follow organizations policies and procedures for working with team members within and outside the organization especially relating to privacy, confidentiality and security.	1	1	-	-
PC6. create an environment of trust and mutual respect	1	2	-	-
Communicate Give and Receive	**5**	**10**	-	-
PC7. use appropriate mode of communication verbal, written, mail, phone or text and clearly articulate your message to ensure that the recipient understands the message	1	1	-	-
PC8. listen to team members and try to understand what they are wanting to say. Seek or provide clarifications if you see any gap in understanding	1	2	-	-
PC9. communicate professionally and follow organization protocols. Do not overload the team members with unnecessary and unsolicited information	1	3	-	-
PC10. share important information with the team timely.	1	2	-	-
PC11. respond to communications promptly.	1	2	-	-

Assessment Criteria for Outcomes	Theory Marks	Practical Marks	Project Marks	Viva Marks
Work Cooperatively	**7**	**8**	-	-
PC12. perform own role and produce output in time for other team members to consume	1	2	-	-
PC13. receive inputs from others and work upon it per role requirement	1	1	-	-
PC14. make adjustments within the permissible rules so that work flows smoothly	1	1	-	-
PC15. help team members to perform their role effectively and provide any clarifications and support they need	1	1	-	-
PC16. share tools and common resources fairly, taking cognizance of others needs and schedules	1	1	-	-
PC17. resolve any contentious issues amicably, involving the team lead or the supervisor if needed	1	1	-	-
PC18. let team members know in good time if you cannot carry out your commitments, explaining the reasons and alternate solutions, if any. Let the team lead know about this.	1	1	-	-
Participate in Team Decision making	**5**	**7**	-	-
PC19. think positively and make constructive suggestions to meet the goals	1	1	-	-
PC20. accept and give suggestions with open mind	1	1	-	-
PC21. take initiatives and volunteer to contribute	1	1	-	-
PC22. help team members with facts and figures to arrive at workable decisions	1	1	-	-
PC23. accept decisions professionally and support these, even if these do not match your suggestions and personal views	1	3	-	-
Demonstrate Sense of Responsibility	**3**	**5**	-	-

Assessment Criteria for Outcomes	Theory Marks	Practical Marks	Project Marks	Viva Marks
PC24. act in the interest of the team and the organization to ensure that things do not fall through the gap and team goals are achieved.	1	3	-	-
PC25. take initiative to correct the situation if something seems to be going wrong	1	1	-	-
PC26. seek help or escalate if the situation demands	1	1	-	-
Show Respect for Opinions, Customs and Preferences	**4**	**4**	-	-
PC27. follow organizations and statutory guidelines about making references or comments to social customs or preferences	1	1	-	-
PC28. refrain from making any comments to hurt sentiments	1	1	-	-
PC29. accommodate team members preferences to the extent feasible. If these come in the way of fulfilling team goals, discuss with the supervisor/ team leader	1	1	-	-
PC30. seek information and clarifications from others if you do not understand any customs	1	1	-	-
NOS Total	**30**	**45**	-	-

National Occupational Standards (NOS) Parameters

NOS Code	IAS/N9001
NOS Name	Work effectively with teams
Sector	Instrumentation
Sub-Sector	Instrumentation & Automation
Primary Occupation	Generic
Secondary Occupation	
NSQF Level	4
Credits	TBD

Version	1.0
Last Reviewed Date	02/05/2019
Next Review Date	01/05/2023
NSQC Clearance Date	22/08/2019

IAS/N9002: Health and safety in workplace

Description

This OS unit is about following adequate safety procedures to make work environment safe

Scope

This unit/ task cover the following: Follow standard safety procedures of the company Maintain good health and posture

Elements and Performance Criteria

Follow standard safety procedures of the company and safety

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

PC1. comply with general safety procedures followed in the company

PC2. Follow standard safety procedures while handling an equipment, hazardous material or tool

PC3. remove finger rings or any other metal objects which may interfere with the work before working on the unit

PC4. use safety materials such as goggles, gloves, ear plugs, caps, ESD pins, covers, shoes, etc

PC5. escalate about any hazardous materials or things found in the premises

PC6. report about any breach of safety procedure in the company

PC7. ensure zero accidents at work

PC8. avoid damage of components due to negligence in ESD procedures

PC9. participate regularly in fire drills or other safety related workshops organized by the company

PC10. ensure no loss for company due to safety negligence

Maintain good health and posture

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

PC11. maintain appropriate posture, especially in long hours of sitting or standing position and in handling heavy materials

PC12. participate in company organized health sessions such as yoga, physiotherapy or games

PC13. handle heavy and hazardous materials with care and using appropriate tools and handling equipment such as trolleys, jacks and ladders

Knowledge and Understanding (KU)

The individual on the job needs to know and understand:

KU1. companys policies on: incentives, delivery standards, and personnel management
KU2. company occupational safety and health policy followed
KU3. company emergency evacuation procedure
KU4. companys medical policy
KU5. how to maintain the work area safe and secure
KU6. how to handle hazardous materials, tools and equipment
KU7. emergency procedures to be followed such as fire accidents, electrocution etc.
KU8. long term value of good posture and use of appropriate handling equipment
KU9. safety regulations and standards and how to apply these **KU10.**
electrical grounding practices

Generic Skills (GS)

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

GS1. compose e mails, letters, memos, reminders, and other documents clearly
GS2. share knowledge, issues, problems and resolutions relating to safety and health
GS3. read mails, messages, alerts
GS4. read pictures, drawings, notes relating to safety and health
GS5. question co-workers in order to understand the safety and health issues
GS6. inform co-workers about safety and health issues
GS7. report issues and problems relating to safety and health to managers in clear terms
GS8. make decisions pertaining to safety and health issues at workplace
GS9. make decisions about escalating safety and health issues at workplace to managers
GS10. plan and organize work conforming to the safety and health norms of the company
GS11. understand real needs of the customer and suggest most appropriate solution
GS12. support customers when they need help
GS13. discuss problems relating to the safety and health, evaluate the possible solution(s) and arrive at optimum /best possible solution(s)in consultation with concerned people
GS14. use the existing information to arrive at actionable decision points
GS15. use the existing information for improving the customer satisfaction
GS16. use the existing information to optimize solution and company business
GS17. analyze problems and identify causes and possible solutions
GS18. apply, analyze, and evaluate the information gathered from observation, experience, reasoning, or communication, as a guide to thought and action
GS19. anticipate problems, risks and opportunities and utilize these for mitigation and business optimization

Assessment Criteria

Assessment Criteria for Outcomes	Theory Marks	Practical Marks	Project Marks	Viva Marks
Follow standard safety procedures of the company and safety	**14**	**24**	-	-
PC1. comply with general safety procedures followed in the company	2	1	-	-
PC2. Follow standard safety procedures while handling an equipment, hazardous material or tool	1	1	-	-
PC3. remove finger rings or any other metal objects which may interfere with the work before working on the unit	2	2	-	-
PC4. use safety materials such as goggles, gloves, ear plugs, caps, ESD pins, covers, shoes, etc	1	3	-	-
PC5. escalate about any hazardous materials or things found in the premises	1	3	-	-
PC6. report about any breach of safety procedure in the company	1	2	-	-
PC7. ensure zero accidents at work	2	3	-	-
PC8. avoid damage of components due to negligence in ESD procedures	1	3	-	-
PC9. participate regularly in fire drills or other safety related workshops organized by the company	2	3	-	-
PC10. ensure no loss for company due to safety negligence	1	3	-	-
Maintain good health and posture	**6**	**6**	-	-
PC11. maintain appropriate posture, especially in long hours of sitting or standing position and in handling heavy materials	2	2	-	-
PC12. participate in company organized health sessions such as yoga, physiotherapy or games	2	2	-	-

Assessment Criteria for Outcomes	Theory Marks	Practical Marks	Project Marks	Viva Marks
PC13. handle heavy and hazardous materials with care and using appropriate tools and handling equipment such as trolleys, jacks and ladders	2	2	-	-
NOS Total	**20**	**30**	**-**	**-**

National Occupational Standards (NOS) Parameters

NOS Code	IAS/N9002
NOS Name	Health and safety in workplace
Sector	Instrumentation
Sub-Sector	Instrumentation & Automation
Primary Occupation	Generic
Secondary Occupation	
NSQF Level	4
Credits	TBD
Version	1.0
Last Reviewed Date	02/05/2019
Next Review Date	01/05/2023
NSQC Clearance Date	22/08/2019

Assessment Guidelines and Assessment Weightage

Assessment Guidelines

1. Criteria for assessment for each Qualification Pack will be created by the Sector Skill Council. EachPerformance Criteria (PC) (PC) will be assigned marks proportional to its importance in NOS. SSC will also lay down proportion of marks for Theory and Skills Practical for each PC.
2. The assessment for the theory part will be based on knowledge bank of questions created by theSSC.
3. Individual assessment agencies will create unique question papers for theory part for eachcandidate at each examination/training center (as per assessment criteria below).
4. Individual assessment agencies will create unique evaluations for skill practical for every studentat each examination/ training center based on these criteria.
5. In case of successfully passing only certain number of NOSs, the trainee is eligible to takesubsequent assessment on the balance NOS's to pass the Qualification Pack.
6. In case of unsuccessful completion, the trainee may seek reassessment on the Qualification Pack

Recommended Pass % : 70

Assessment Weightage

Compulsory NOS

National Occupational Standards	Theory Marks	Practical Marks	Project Marks	Viva Marks	Total Marks	Weightage
IAS/N3103.Maintain site readiness and instrument usability as applicable for process control industry	44	56	-	-	100	17
IAS/N3104.Perform process control preventive maintenance	50	50	-	-	100	17
IAS/N3106.Perform predictive, corrective and shutdown maintenance for process control	42	58	-	-	100	17

National Occupational Standards	Theory Marks	Practical Marks	Project Marks	Viva Marks	Total Marks	Weightage
IAS/N3107.Perform installation of instruments and loop testing as per instructions	44	56	-	-	100	17
IAS/N3108.Perform process control reporting tasks	30	30	-	-	60	10
IAS/N9001.Work effectively with teams	30	45	-	-	75	13
IAS/N9002.Health and safety in workplace	20	30	-	-	50	9
Total	**260**	**325**	**-**	**-**	**585**	**100**