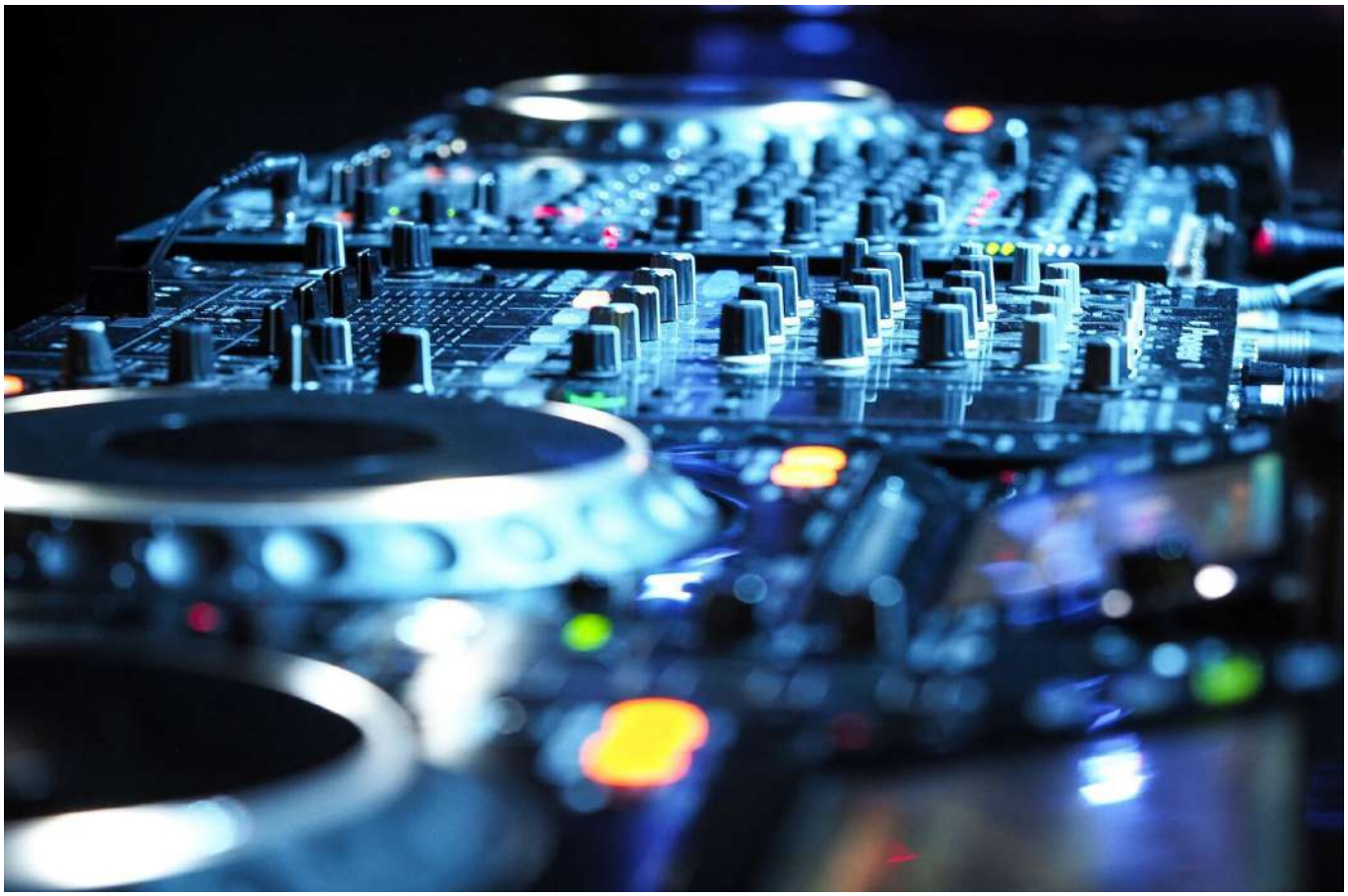

Installation and Commissioning Technician (AM/FM Radio Station)

QP Code: IAS/Q0204

Version: 1.0

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/Q0204: Installation and Commissioning Technician (AM/FM Radio Station)

Brief Job Description

The installation and commissioning technician is responsible for the installation of subsystems of AM/FM Radio Broadcasting Transmitters and Sound Recording Studios. The individual also assists the Installation & Commissioning Engineer in testing and commissioning.

Personal Attributes

This job requires discipline and attention to detail, interdisciplinary aptitude and ability to learn. The person should be willing to work for long hours to meet deadlines and be able to cope with pressure.

Applicable National Occupational Standards (NOS)

Compulsory NOS:

1. IAS/N0215: Install AM/FM radio broadcasting station
2. IAS/N0216: Assist in testing of AM/FM radio broadcasting station
3. IAS/N9001: Work effectively with teams
4. IAS/N9002: Health and safety in workplace

Qualification Pack (QP) Parameters

Sector	Instrumentation
Sub-Sector	Communication (Broadcast)
Occupation	Installation and Commissioning
Country	India
NSQF Level	4
Aligned to NCO/ISCO/ISIC Code	NCO-2015/NIL
Minimum Educational Qualification & Experience	I.T.I (Electronics) with NA of experience
Minimum Level of Education for Training in School	Not Applicable
Pre-Requisite License or Training	NA
Minimum Job Entry Age	19 Years

Last Reviewed On	22/04/2020
Next Review Date	22/04/2025
Deactivation Date	22/04/2025
NSQC Approval Date	
Version	1.0

IAS/N0215: Install AM/FM radio broadcasting station

Description

This unit is about installing various sub systems of AM/FM Transmitter and Sound Recording Studio, according to the design, BoQ and the material provided.

Scope

The scope covers the following :

- Prepare for installation
- Perform laying of cable trays, cables, raceways and conduits
- Fix connectors and terminate cables
- Install equipment and software at studio
- Install equipment and software at transmission centre
- Install electric power supply

Elements and Performance Criteria

Prepare for installation

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

PC1. identify the workflow of the entire broadcast chain and facility

PC2. analyse the floor plan of studio and transmitter station site

PC3. interpret the content of technical and installation manual of all equipment to be installed

PC4. select the best suitable area for placement of power supply equipment, systems and other equipment in studio and transmitter station site

PC5. mark the placement of ventilation and air conditioning equipment at the studio and transmitter centre

PC6. plan the placement of server rack, cable harness, etc. at the studio and transmitter centre

Perform laying of cable trays, cables, raceways and conduits

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

PC7. mark the position for equipment and cable routing on the floor and wall at studio and transmitter station centre

PC8. install raceways, cable trays and conduiting work as per the drawing for electrical power wires/cables for both the centres

PC9. install conduits as per the drawing for routing the audio and networking cables for both the centre

PC10. install cable trays/raceways/wall support structure as per the drawing for laying the rigid lines, RF feeder cables etc. at the transmitter centre

PC11. perform laying and termination of all the cables with appropriate sized lugs, ferrules, etc. as per the installation manual at both the centres

Fix connectors and terminate cables

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

PC12. prepare connection for power supply cables as per the installation manual

PC13. fix connectors and terminate microphone cables, audio cables, data cables and RF rigid lines / cables as per the installation manual

PC14. plan laying and routing of microphone cables for interconnecting the audio equipment

PC15. perform labelling of all microphone cables using standard notation and legends

PC16. verify polarity of audio connectors in conformity with standard notation

PC17. perform sealing of conduit ends using approved material/device

Install equipment and software at studio

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

PC18. prepare a plan for installation of LT distribution kiosk, cabling, earthing and other LT power supply works

PC19. provide UPS back up power connection to all equipment as per the consultant's drawing

PC20. install and wire the audio equipment, computer, studio transmitter link equipment and network-enabled devices like mixers, telephone hybrid, etc.

PC21. follow appropriate procedure to securely connect earth wires with the equipment

PC22. install studio automation software for recording, postproduction, playlist creation, playback and archiving functions

Install equipment and software at transmission centre

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

PC23. prepare a plan for installing LT distribution kiosk, cabling, earthing and doing other LT power supply works

PC24. provide UPS back up power connection to all equipment as per the OEM's recommendation

PC25. plan for positioning the transmitter, coaxial switch, RF rigid line feeders, UPS, LT switchgear, etc. on the floor as per the installation manual

PC26. install RF rigid line from transmitter/RF change over output to the outdoor coaxial feeder cable through a wall feed using an insulator at the FM transmitter site

PC27. install the transmission line (feeder line) from the wall through an insulator (transmitter) to the ATU at the AM transmitter site

PC28. install cable dehydrator and the associated plumbing for the outdoor coaxial feeder cable at FM transmitter site

PC29. install and wire the broadcast processor, the codec for the STL link, the transmitter (along with standby transmitter, if provided), the RF change over switch and dummy load

PC30. install and wire the AM/FM demodulator, remote monitoring equipment and monitoring equipment as per the installation manual

PC31. verify that the earth strips are securely connected to high power equipment viz. UPS and AM/FM transmitter

PC32. install the indoor RF rigid lines/transmission lines at the transmitter centre for interconnecting transmitter, combiner and feeder cable

Install electric power supply

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

PC33. implement the plan of electrical installation for interconnecting ESCOM incoming supply, captive power source, main distribution board, UPS, switch boards for lighting, equipment and general purpose power points

PC34. install UPS system and power distribution as per recommended procedures and drawings

PC35. route electric wires in conduits for the luminaries over the false ceiling

PC36. label all cables as per the drawing for ease of identification
PC37. seal conduits with glass wool buds to prevent sound leakage and ingress of insects

Knowledge and Understanding (KU)

The individual on the job needs to know and understand:

KU1. organisation's hierarchy and reporting structure
KU2. organisation's code of conduct
KU3. organisation's culture
KU4. organisation's documentation policy
KU5. organisation's policy on quality and standards
KU6. organisation's business, locations, products, services and clients
KU7. organisation's website, contact personnel and related details
KU8. purpose of the project, the workflow and the procedure involved
KU9. layout of the station and location of various facilities
KU10. site conditions and how these impact the installation works and the operational and maintenance activities
KU11. rules and regulations to be followed under normal and emergency conditions
KU12. type of equipment / installation material used and how these impact the site conditions
KU13. types of hand tools, accessories and their locations

Generic Skills (GS)

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

GS1. read and write e-mails, letters and other official documents
GS2. read and use formats and checklist for site readiness planning and reports
GS3. read and prepare schedules and timelines
GS4. read organisation's policy related to site safety precaution
GS5. read and interpret instructions received from installation engineer
GS6. read all documents such as drawings, manuals, instructions, technical specifications, etc.
GS7. read standards and regulatory compliance documents
GS8. interact with co-workers regarding work and schedule
GS9. co-ordinate with customers, vendors and partners about work progress
GS10. describe issues and problems to the supervisor / engineer
GS11. communicate with the supervisor / engineer about work progress
GS12. take decisions pertaining to the installation
GS13. take pragmatic decisions to keep the project on track when issues arise in the work done by partners or vendors, without compromising on the quality
GS14. execute the plan for the installation and detail its activities so that it can be finished on time
GS15. help the I&C engineer in preparing the installation plan

GS16. identify needs of the customer and suggest most appropriate solution

GS17. support customers when needed

GS18. evaluate the possible solution(s) to a problem and suggest an optimum solution

GS19. identify immediate solution(s) to avoid delays

GS20. use existing information to arrive at course of actions

GS21. use existing information for improving customer satisfaction

GS22. use existing information to optimise solution and company business

GS23. analyse problems, identify the causes and provide possible solutions

GS24. apply, analyse and evaluate the information gathered from observation, experience, reasoning, or communication as a guide for thought and action

GS25. analyse the operations of the existing facility layout and suggest economically feasible measures for optimisation

Assessment Criteria

Assessment Criteria for Outcomes	Theory Marks	Practical Marks	Project Marks	Viva Marks
Prepare for installation	**8**	**22**	**-**	**2**
PC1. identify the workflow of the entire broadcast chain and facility	1	3	-	1
PC2. analyse the floor plan of studio and transmitter station site	2	4	-	-
PC3. interpret the content of technical and installation manual of all equipment to be installed	1	4	-	-
PC4. select the best suitable area for placement of power supply equipment, systems and other equipment in studio and transmitter station site	1	4	-	-
PC5. mark the placement of ventilation and air conditioning equipment at the studio and transmitter centre	1	4	-	-
PC6. plan the placement of server rack, cable harness, etc. at the studio and transmitter centre	2	3	-	1
Perform laying of cable trays, cables, raceways and conduits	**11**	**23**	**-**	**2**
PC7. mark the position for equipment and cable routing on the floor and wall at studio and transmitter station centre	2	4	-	1
PC8. install raceways, cable trays and conduiting work as per the drawing for electrical power wires/cables for both the centres	2	4	-	1
PC9. install conduits as per the drawing for routing the audio and networking cables for both the centre	2	5	-	-
PC10. install cable trays/raceways/wall support structure as per the drawing for laying the rigid lines, RF feeder cables etc. at the transmitter centre	2	5	-	-
PC11. perform laying and termination of all the cables with appropriate sized lugs, ferrules, etc. as per the installation manual at both the centres	3	5	-	-

Assessment Criteria for Outcomes	Theory Marks	Practical Marks	Project Marks	Viva Marks
Fix connectors and terminate cables	**13**	**15**	**-**	**2**
PC12. prepare connection for power supply cables as per the installation manual	3	3	-	1
PC13. fix connectors and terminate microphone cables, audio cables, data cables and RF rigid lines / cables as per the installation manual	3	3	-	1
PC14. plan laying and routing of microphone cables for interconnecting the audio equipment	2	3	-	-
PC15. perform labelling of all microphone cables using standard notation and legends	2	2	-	-
PC16. verify polarity of audio connectors in conformity with standard notation	1	2	-	-
PC17. perform sealing of conduit ends using approved material/device	2	2	-	-
Install equipment and software at studio	**12**	**15**	**-**	**1**
PC18. prepare a plan for installation of LT distribution kiosk, cabling, earthing and other LT power supply works	1	2	-	-
PC19. provide UPS back up power connection to all equipment as per the consultant’s drawing	2	3	-	-
PC20. install and wire the audio equipment, computer, studio transmitter link equipment and network-enabled devices like mixers, telephone hybrid, etc.	5	4	-	1
PC21. follow appropriate procedure to securely connect earth wires with the equipment	2	3	-	-
PC22. install studio automation software for recording, postproduction, playlist creation, playback and archiving functions	2	3	-	-
Install equipment and software at transmission centre	**21**	**30**	**-**	**3**
PC23. prepare a plan for installing LT distribution kiosk, cabling, earthing and doing other LT power supply works	2	2	-	-

Assessment Criteria for Outcomes	Theory Marks	Practical Marks	Project Marks	Viva Marks
PC24. provide UPS back up power connection to all equipment as per the OEM's recommendation	2	2	-	-
PC25. plan for positioning the transmitter, coaxial switch, RF rigid line feeders, UPS, LT switchgear, etc. on the floor as per the installation manual	2	2	-	-
PC26. install RF rigid line from transmitter/RF change over output to the outdoor coaxial feeder cable through a wall feed using an insulator at the FM transmitter site	2	5	-	-
PC27. install the transmission line (feeder line) from the wall through an insulator (transmitter) to the ATU at the AM transmitter site	2	4	-	-
PC28. install cable dehydrator and the associated plumbing for the outdoor coaxial feeder cable at FM transmitter site	2	4	-	1
PC29. install and wire the broadcast processor, the codec for the STL link, the transmitter (along with standby transmitter, if provided), the RF change over switch and dummy load	3	4	-	1
PC30. install and wire the AM/FM demodulator, remote monitoring equipment and monitoring equipment as per the installation manual	2	3	-	-
PC31. verify that the earth strips are securely connected to high power equipment viz. UPS and AM/FM transmitter	2	2	-	-
PC32. install the indoor RF rigid lines/transmission lines at the transmitter centre for interconnecting transmitter, combiner and feeder cable	2	2	-	1
Install electric power supply	**10**	**10**	**-**	**-**
PC33. implement the plan of electrical installation for interconnecting ESCOM incoming supply, captive power source, main distribution board, UPS, switch boards for lighting, equipment and general purpose power points	3	2	-	-
PC34. install UPS system and power distribution as per recommended procedures and drawings	2	2	-	-

Assessment Criteria for Outcomes	Theory Marks	Practical Marks	Project Marks	Viva Marks
PC35. route electric wires in conduits for the luminaries over the false ceiling	2	2	-	-
PC36. label all cables as per the drawing for ease of identification	1	2	-	-
PC37. seal conduits with glass wool buds to prevent sound leakage and ingress of insects	2	2	-	-
NOS Total	**75**	**115**	**-**	**10**

National Occupational Standards (NOS) Parameters

NOS Code	IAS/N0215
NOS Name	Install AM/FM radio broadcasting station
Sector	Instrumentation
Sub-Sector	Communication (Broadcast)
Occupation	Installation and Commissioning,
NSQF Level	4
Credits	TBD
Version	1.0
Last Reviewed Date	NA
Next Review Date	NA
NSQC Clearance Date	

IAS/N0216: Assist in testing of AM/FM radio broadcasting station

Description

This unit is about supporting I&C Engineer in testing all subsystems of AM/FM Radio Transmitter and Studios and the integrated system for best performance

Scope

The scope covers the following :

- Prepare for testing
- Inspect electric power supply and air conditioning
- Test audio / IT equipment and RF equipment
- Prepare for commissioning and hands-on training

Elements and Performance Criteria

Prepare for testing

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

PC1. identify the testing process of the entire setup based on the documents provided by the respective OEM and consultant

PC2. identify the operating conditions and functioning of each of the equipment

Inspect electric power supply and air conditioning

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

PC3. inspect all electric, audio, RF and data connectivity

PC4. verify that polarity for the hot (positive/red), cold (negative/black) and ground (green) points for audio are connected as per the standard practice

PC5. test to ensure that power supply line, Neutral and Earth are connected as per the standard practice

PC6. monitor and log the power supply voltage and current drawn by all the major equipment using multimeter and clip-on ammeter

PC7. test and log the AC voltage between Neutral and Earth of incoming supply, distribution board and every point socket

PC8. examine earth connectivity in case AC voltage is more than 1 V

PC9. inspect the balancing of electric power loads on all the three phases

PC10. measure and log the air flow, outdoor and indoor temperatures and relative humidity to ascertain optimum working of air conditioning

Test audio / IT equipment and RF equipment

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

PC11. assist the Radio Broadcast engineer test the condition and functionality of the equipment across all important parameters such as THD, SNR, response, insertion loss, etc.

PC12. assist the Radio Broadcast Engineer in the measurement and documentation (logging) of all vital parameters in the audio/RF equipment like return loss of the combined feeder cable/antenna during cold condition and forward/reflected power during the operating condition of the transmitter and transfer switch, etc.

PC13. prepare log of important parameters displayed by the transmitter's front panel for reference

Prepare for commissioning and hands-on training

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

PC14. check the entire system visually to ensure its normal performance

PC15. arrange for listening tests of the chain and final broadcast

PC16. organise hands-on training for the station staff based on the operation and maintenance of the setup

Knowledge and Understanding (KU)

The individual on the job needs to know and understand:

KU1. organisation’s hierarchy and reporting structure

KU2. organisation’s code of conduct

KU3. organisation’s culture

KU4. organisation’s documentation policy

KU5. organisation’s policy on quality and standards

KU6. organisation’s business, locations, products, services and clients

KU7. organisation’s partners and their products and services

KU8. organisation’s website, contact personnel and related details

KU9. organisation’s sales and after-sales policy

KU10. basics of electrical, electronics and electrical communication equipment

KU11. basics of computers and human machine interface (HMI)

KU12. normal electrical safety precautions and special safety procedure and precaution to be followed while working on RF equipment and high rise transmission towers

KU13. quality, standards and guidelines to be followed during the installation of high power broadcast communication equipment

KU14. basics of radio broadcast transmission chain consisting of audio input equipment, transmitter, change over equipment, antenna, dummy load, monitoring chain, etc.

KU15. the process of installation of application software used for preparation of playlist, post production, commercial logging, etc.

KU16. the use of test and measuring equipment like Audio Analyser, RF Network Analyser, etc.

KU17. electrical panel components and wiring process

KU18. process and parameters involved in the testing of individual equipment and entire chain

KU19. relevant regulations, standards and codes of practice and their implications on the installation

KU20. the setup and operation of test and measurements used in the final testing and commissioning to help the Radio Broadcast Engineer

Generic Skills (GS)

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

GS1. write e-mails, letters and other official documents
GS2. fill test reports in prescribed format
GS3. write or edit user training related material
GS4. read technical specifications, drawings, manuals, instructions
GS5. read standards and regulatory compliance documents
GS6. read schedules and timelines
GS7. interact with co-workers regarding work and schedule
GS8. co-ordinate with customers, vendors and partners about work progress
GS9. describe issues and problems to the supervisor / engineer
GS10. communicate with the supervisor / engineer about work progress
GS11. take decisions pertaining to the project while installing, testing and commissioning
GS12. take pragmatic decisions to keep the project on track when issues arise with the work done by partners or vendors, without compromising on the quality
GS13. co-ordinate with the team and management regarding necessary adjustments to be made in schedules and timelines
GS14. execute the plan for the installation and detail its activities so that it can be finished on time
GS15. allocate and supervise work of the team members
GS16. identify needs of the customer and suggest most appropriate solution
GS17. support customers when needed
GS18. evaluate the possible solution(s) to a problem and suggest an optimum solution
GS19. identify immediate solution(s) to avoid delays
GS20. use existing information to arrive at course of actions
GS21. use existing information for improving customer satisfaction
GS22. use existing information to optimise solution and company business
GS23. analyse problems, identify the causes and provide possible solutions
GS24. apply, analyse and evaluate the information gathered from observation, experience, reasoning, or communication as a guide for thought and action
GS25. analyse the operations of the existing facility layout and suggest economically feasible measures for optimisation

Assessment Criteria

Assessment Criteria for Outcomes	Theory Marks	Practical Marks	Project Marks	Viva Marks
Prepare for testing	**5**	**5**	**-**	**2**
PC1. identify the testing process of the entire setup based on the documents provided by the respective OEM and consultant	3	3	-	1
PC2. identify the operating conditions and functioning of each of the equipment	2	2	-	1
Inspect electric power supply and air conditioning	**9**	**18**	**-**	**2**
PC3. inspect all electric, audio, RF and data connectivity	2	3	-	1
PC4. verify that polarity for the hot (positive/red), cold (negative/black) and ground (green) points for audio are connected as per the standard practice	1	2	-	-
PC5. test to ensure that power supply line, Neutral and Earth are connected as per the standard practice	1	2	-	-
PC6. monitor and log the power supply voltage and current drawn by all the major equipment using multimeter and clip-on ammeter	1	2	-	-
PC7. test and log the AC voltage between Neutral and Earth of incoming supply, distribution board and every point socket	1	2	-	-
PC8. examine earth connectivity in case AC voltage is more than 1 V	1	2	-	-
PC9. inspect the balancing of electric power loads on all the three phases	1	3	-	1
PC10. measure and log the air flow, outdoor and indoor temperatures and relative humidity to ascertain optimum working of air conditioning	1	2	-	-
Test audio / IT equipment and RF equipment	**16**	**14**	**-**	**3**

Assessment Criteria for Outcomes	Theory Marks	Practical Marks	Project Marks	Viva Marks
PC11. assist the Radio Broadcast engineer test the condition and functionality of the equipment across all important parameters such as THD, SNR, response, insertion loss, etc.	5	5	-	1
PC12. assist the Radio Broadcast Engineer in the measurement and documentation (logging) of all vital parameters in the audio/RF equipment like return loss of the combined feeder cable/antenna during cold condition and forward/reflected power during the operating condition of the transmitter and transfer switch, etc.	8	5	-	1
PC13. prepare log of important parameters displayed by the transmitter's front panel for reference	3	4	-	1
Prepare for commissioning and hands-on training	**10**	**13**	**-**	**3**
PC14. check the entire system visually to ensure its normal performance	4	5	-	1
PC15. arrange for listening tests of the chain and final broadcast	3	3	-	1
PC16. organise hands-on training for the station staff based on the operation and maintenance of the setup	3	5	-	1
NOS Total	**40**	**50**	**-**	**10**

National Occupational Standards (NOS) Parameters

NOS Code	IAS/N0216
NOS Name	Assist in testing of AM/FM radio broadcasting station
Sector	Instrumentation
Sub-Sector	Communication (Broadcast)
Occupation	Installation and Commissioning,
NSQF Level	4
Credits	TBD
Version	1.0
Last Reviewed Date	NA
Next Review Date	NA
NSQC Clearance Date	

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
Occupation	Generic
NSQF Level	4
Credits	TBD
Version	1.0
Last Reviewed Date	02/05/2019
Next Review Date	01/05/2023
NSQC Clearance Date	

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
Occupation	Generic
NSQF Level	4
Credits	TBD
Version	1.0
Last Reviewed Date	02/05/2019
Next Review Date	01/05/2023
NSQC Clearance Date	

Assessment Guidelines and Assessment Weightage

Assessment Guidelines

1. Each Performance Criteria (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 the SSC.

3. Assessment will be conducted for all compulsory NOS, and where applicable, on the selected elective/option NOS/set of NOS.

4. Individual assessment agencies will create unique question papers for theory part for each candidate at each examination/training centre (as per assessment criteria below).

5. Individual assessment agencies will create unique evaluations for skill practical for every student at each examination/training centre based on this criterion.

6. To pass the Qualification Pack, every trainee should score a minimum of 70% of aggregate marks to successfully clear the assessment.

7. 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/N0215.Install AM/FM radio broadcasting station	75	115	-	10	200	50
IAS/N0216.Assist in testing of AM/FM radio broadcasting station	40	50	-	10	100	25
IAS/N9001.Work effectively with teams	30	45	-	-	75	15

National Occupational Standards	Theory Marks	Practical Marks	Project Marks	Viva Marks	Total Marks	Weightage
IAS/N9002.Health and safety in workplace	20	30	-	-	50	10
Total	**165**	**240**	**-**	**20**	**425**	**100**

Acronyms

NOS	National Occupational Standard(s)
NSQF	National Skills Qualifications Framework
QP	Qualifications Pack
TVET	Technical and Vocational Education and Training
AM	Amplitude Modulation
FM	Frequency Modulation
ATU	Antenna Tuning Unit
BoQ	Bill of Quantities
CCTV	Closed Circuit Television
ESD	Electro Static Discharge
RF	Radio Frequency
ESCOM	Electricity Supply Company
HVAC	Heating, Ventilation and Air Conditioning
I&C	Installation & Commissioning
GI	Galvanized iron
XLR	Standard professional audio connector
SPL	Sound pressure level
RT60	A term used for defining the Reverberation time of a space
STI	Speech Transmission Index
THD	Total Harmonic Distortion
SNR	Signal to Noise Ratio
STL	Studio-transmitter-link
ATP	Acceptance Test Protocol
HT/LT	High Tension / Low Tension AC Power Supply

Glossary

Sector	Sector is a conglomeration of different business operations having similar business and interests. It may also be defined as a distinct subset of the economy whose components share similar characteristics and interests.
Sub-sector	Sub-sector is derived from a further breakdown based on the characteristics and interests of its components.
Occupation	Occupation is a set of job roles, which perform similar/ related set of functions in an industry.
Job role	Job role defines a unique set of functions that together form a unique employment opportunity in an organisation.
Occupational Standards (OS)	OS specify the standards of performance an individual must achieve when carrying out a function in the workplace, together with the Knowledge and Understanding (KU) they need to meet that standard consistently. Occupational Standards are applicable both in the Indian and global contexts.
Performance Criteria (PC)	Performance Criteria (PC) are statements that together specify the standard of performance required when carrying out a task.
National Occupational Standards (NOS)	NOS are occupational standards which apply uniquely in the Indian context.
Qualifications Pack (QP)	QP comprises the set of OS, together with the educational, training and other criteria required to perform a job role. A QP is assigned a unique qualifications pack code.
Unit Code	Unit code is a unique identifier for an Occupational Standard, which is denoted by an 'N'
Unit Title	Unit title gives a clear overall statement about what the incumbent should be able to do.
Description	Description gives a short summary of the unit content. This would be helpful to anyone searching on a database to verify that this is the appropriate OS they are looking for.
Scope	Scope is a set of statements specifying the range of variables that an individual may have to deal with in carrying out the function which have a critical impact on quality of performance required.
Knowledge and Understanding (KU)	Knowledge and Understanding (KU) are statements which together specify the technical, generic, professional and organisational specific knowledge that an individual needs in order to perform to the required standard.

Organisational Context	Organisational context includes the way the organisation is structured and how it operates, including the extent of operative knowledge managers have of their relevant areas of responsibility.
Technical Knowledge	Technical knowledge is the specific knowledge needed to accomplish specific designated responsibilities.
Core Skills/ Generic Skills (GS)	Core skills or Generic Skills (GS) are a group of skills that are the key to learning and working in today's world. These skills are typically needed in any work environment in today's world. These skills are typically needed in any work environment. In the context of the OS, these include communication related skills that are applicable to most job roles.
Electives	Electives are NOS/set of NOS that are identified by the sector as contributive to specialization in a job role. There may be multiple electives within a QP for each specialized job role. Trainees must select at least one elective for the successful completion of a QP with Electives.
Options	Options are NOS/set of NOS that are identified by the sector as additional skills. There may be multiple options within a QP. It is not mandatory to select any of the options to complete a QP with Options.