Model Curriculum

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

QP Code: IAS/Q0204

QP Version: 1.0

NSQF Level: 4

Model Curriculum Version: 1.0

Instrumentation Automation Surveillance & Communication Sector Skill Council
201-202 STBP NSIC Complex (Gate No. 02), Okhla Industrial Area, New Delhi-110020

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Training Parameters

Sector	Instrumentation Automation Surveillance and Communication
Sub-Sector	Broadcast Communication
Occupation	Installation and Commissioning
Country	India
NSQF Level	4
Aligned to NCO/ISCO/ISIC Code	NCO-2015/NIL
Minimum Educational Qualification & Experience	ITI Electronics or relevant trade
Pre-Requisite License or Training	NA
Minimum Job Entry Age	19 Years
Last Reviewed On	21/01/2020
Next Review Date	21/01/2025
NSQC Approval Date	
Version	1.0
Model Curriculum Creation Date	21/01/2020
Model Curriculum Valid Up to Date	21/01/2025
Model Curriculum Version	1.0
Minimum Duration of the Course	280 Hours, 0 Minutes
Maximum Duration of the Course	280 Hours, 0 Minutes

Program Overview

This section summarizes the end objectives of the program along with its duration.

Training Outcomes

At the end of the program, the learner should have acquired the listed knowledge and skills.

- Identify the role, responsibilities and scope of work of an Installation and Commissioning Technician (AM/FM Radio Station)
- Perform installation of AM/FM Radio Broadcasting Station
- Provide assistance to Radio Broadcast Engineer in testing of AM/FM Radio Broadcasting Station
- Demonstrate working effectively in a team
- Adhere to the health and safety practices at workplace

Compulsory Modules

The table lists the modules and their duration corresponding to the Compulsory NOS of the QP.

NOS and Module Details	Theory Duration	Practical Duration	On-the-Job Training Duration (Mandatory)	On-the-Job Training Duration (Recommended)	Total Duration
Introduction to the role of Installation and Commissioning Technician (AM / FM Radio Station) *Bridge Module*	24:00	00:00	-	-	24:00
IAS/N0215 - Install AM/FM radio broadcasting station **NOS Version No. 1.0** **NSQF Level 4**	**32:00**	**72:00**	**-**	**-**	**104:00**
Install AM/FM Broadcasting Station	32:00	72:00	-	-	104:00
IAS/N0216 - Assist in testing of AM/FM radio broadcasting station **NOS Version No. 1.0** **NSQF Level 4**	**32:00**	**72:00**	**-**	**-**	**104:00**
Assist in Testing of AM/FM Radio Broadcasting Station	32:00	72:00	-	-	104:00
IAS/N9001 - Work effectively with teams **NOS Version No. 1.0** **NSQF Level 4**	**08:00**	**16:00**	**-**	**-**	**24:00**
Soft Skills and Work Ethics	08:00	16:00	-	-	24:00

IAS/N9002 - Health and safety in workplace **NOS Version No. 1.0** **NSQF Level 4**	**08:00**	**16:00**	**-**	**-**	**24:00**
Basic Health & Safety Practices	08:00	16:00	-	-	24:00
Total Duration	**104:00**	**176:00**	**-**	**-**	**280:00**

Module Details

Introduction to the role of Installation and Commissioning Technician (AM/FM Radio Station)

Terminal Outcomes:

- Identify the role, responsibilities an Installation and Commissioning Technician (AM/FM Radio Station)

Duration: *24:00*	**Duration**: *00:00*
Theory – Key Learning Outcomes	**Practical – Key Learning Outcomes**
• Define the role and responsibilities of Installation and Commissioning Technician (AM / FM Radio Station) • Define radio broadcasting and the difference between AM / FM radio broadcasting • Explain the workflow of radio broadcasting transmission chain • Describe the technologies involved in radio broadcasting • Explain the basics of electronics, electrical communication equipment, electrical panel and wiring w.r.t. radio broadcasting • List the basics of computers, human machine interface and application software • Describe the significance of applicable rules and regulations, including emergencies	
Classroom Aids:	
Laptop, white board, marker, projector, guidelines	
Tools, Equipment and Other Requirements	
Electric panel, station layout, hand tools, accessories, equipment	

Install AM/FM Broadcasting Station
Mapped to IAS/N0215

Terminal Outcomes:

- Identify the scope of work
- Perform installation of AM/FM Radio Broadcasting Station

Duration: *32:00*	**Duration**: *72:00*
Theory – Key Learning Outcomes	**Practical – Key Learning Outcomes**
• Identify the layout of the station, the facilities, their condition and their effect on installation / maintenance work • Identify the areas for positioning of power supply equipment, air-conditioning equipment, server rack, cable harness, transmitter, coaxial switch, etc. at studio and transmitter site • Interpret drawing as well as technical and installation manuals • Plan the cable routing / conduiting for the floor and wall at the studio and transmitter station site • List the types of tools, accessories, measuring instrument, to be used in installation and commissioning • Identify the connection of earth strips with all high power equipment • Ensure that the electrical installation is carried out as per the plan and proper arrangements are made to keep captive power source • Describe the quality, standards, codes of practice and guidelines to be followed during installation	• Demonstrate the functioning of the equipment and operating conditions for the maintenance • Perform installation of raceways, cable trays, audio and networking cables as per the drawing, at both centres • Perform the laying of rigid lines, RF feeder cables, etc. at the transmitter station site • Demonstrate termination of all the cables with appropriate lugs, ferrules, etc. and label them as per the drawing • Execute the plan to fix connectors for power supply cables and microphone cables • Inspect the polarity of audio connectors in conformity with the standard notation • Demonstrate sealing of the conduit ends with approved material such as glass wood buds, etc. • Execute plan for installation of LT distribution kiosk, cabling, earthing and other LT power supply works at both sites • Install UPS and its power back up for all equipment including computer, audio, etc. at both sites • Demonstrate the wiring and installation of all equipment such as computers, studio transmitter link, mixers, audio, etc. along with earthing • Perform installation of studio automation software with all functionalities in place • Install RF rigid line / RF change over output, cable dehydrator and the associated plumbing for FM transmitter site / transmitter centre • Install transmission line for AM transmitter site

	• Perform installation and wiring of broadcast processor, the codec for STL link, AM / FM Demodulator, monitoring equipment, etc.
Classroom Aids:	
Laptop, white board, marker, projector	
Tools, Equipment and Other Requirements	
Cables, cable trays, raceways, conduits, connectors, lugs, ferrules, power supply cables, microphone cables, LT distribution kiosk, UPS, audio equipment, earth wires, mixers, telephone hybrid, studio transmitter link, transmitter, cable dehydrator, AM/FM demodulator, monitoring equipment, high power RF equipment DG/Solar Panel, glass wool buds Studio automation software Drawings, manuals, floor plan	

Assist in Testing of AM/FM Radio Broadcasting Station
Mapped to IAS/N0216

Terminal Outcomes:

- Provide assistance to Radio Broadcast Engineer in testing of AM/FM Radio Broadcasting Station

Duration: *32:00*	**Duration**: *72:00*
Theory – Key Learning Outcomes	**Practical – Key Learning Outcomes**
• List the steps of final testing and commissioning • Identify ways to perform physical inspection of all electric, audio (polarity of hot, cold and ground points), RF, data connectivity, power supply line, etc. • Explain ways to assist Radio Broadcast Engineer in testing the equipment, which includes measuring and recording the performance of audio / RF equipment • List the parameters and procedures of testing the equipment and entire chain • Maintain record of all parameters as per transmitter's front panel • Organise training of the station staff on operation and maintenance of the set up	• Demonstrate inspecting the power supply voltage, equipment voltage, AC voltage, and earth connectivity (if needed) using the appropriate equipment • Illustrate troubleshooting the error with the recommendation of consultant in case of any deviation • Demonstrate balancing the power by distributing the load on all three phases • Execute the plan to maintain conditions, such as air flow, temperatures, humidity, etc., for optimum working of air conditioning plants • Demonstrate assisting Radio Broadcast Engineer in measuring all imp. parameters of sound recording studio and carrying out RF measurements • Perform verification of the whole set up, including listening tests of chain / broadcast, to ensure its normal functioning
Classroom Aids:	
Laptop, white board, marker, projector	
Tools, Equipment and Other Requirements	
Multimeter, clip-on ammeter, measuring tools and equipment, SPL meter, RT60 measurement and STI	

Soft Skills and Work Ethics
Mapped to IAS/N9001

Terminal Outcomes:

- Work effectively at the workplace

Duration: *08:00*	**Duration**: *16:00*
Theory – Key Learning Outcomes	**Practical – Key Learning Outcomes**
• Explain the importance of working towards team objectives and goals • Identify the code of conduct towards team members w.r.t. their culture, preferences, roles and responsibilities • Identify the importance of effective communication and interpersonal skills • Identify the common reasons for interpersonal conflicts and ways of managing them effectively • Identify the importance of standard operating procedures of the company w.r.t. privacy, confidentiality and security • Identify the issues with process flow improvements, quality of output, product defects received from previous process, repairs and maintenance of tools and machinery and handle them • Identify the need for implementing standards, guidelines and practices pertaining to gender sensitivity, including work ethics and workplace etiquettes • Identify the need for implementing standards, guidelines and practices pertaining to sensitivity towards Persons with Disabilities (PwD) • Explain the specific ways to help persons with disability overcome the challenges • List organisational guidelines for dress code, time schedules, language and other soft skill aspects	• Apply team building skills and assist colleagues to maximise effectiveness and efficiency in carrying out tasks • Apply appropriate communication skills and etiquettes while interacting with others • Demonstrate use of inclusive language irrespective of disability and the gender of the person • Demonstrate active listening skills while communicating • Illustrate how to interact with supervisor to receive instructions and report problems that need escalation • Demonstrate ideal workplace ethics while interacting with colleagues • Demonstrate working effectively with colleagues by assisting them whenever required • Illustrate appropriate behaviour towards all genders and differently abled people
Classroom Aids:	
White board/ black board marker / chalk, duster, computer or Laptop attached to LCD projector	
Tools, Equipment and Other Requirements	
Sample of escalation matrix, organisation structure.	

Basic Health and Safety Practices
Mapped to IAS/N9002

Terminal Outcomes:

- Apply health and safety practices at the workplace

Duration: *08:00*	**Duration**: *16:00*
Theory – Key Learning Outcomes	**Practical – Key Learning Outcomes**
• Explain the importance of health and safety guidelines • List the components of a basic first-aid kit, safety tools and equipment • Identify the practices for maintaining safe and secure workplace • List the precautions for handling different types of cables and electrical equipment • List the daily safety instructions and the other recommended safety procedures for work—before starting work, while working, after finishing work • Describe the safety drills and health related activities scheduled in the organisation • Identify the types of fire and use correct fire extinguishers • Identify the general safety procedures and standard safety procedures for handling tools, equipment and hazardous materials • Identify the importance of good postures for lifting heavy objects • Explain the importance of efficient utilisation of material and water • Identify common practices of conserving electricity • List the common sources of pollution and ways to minimise it • Describe the concept of waste management and methods of waste disposal • List the different categories of waste for the purpose of segregation	• Apply methods of accident prevention in the work environment • Demonstrate using proper techniques for disposal of hazardous chemicals, tools and materials by following prescribed environmental norms or as per company policy • Report any abnormal situation/behaviour of any equipment/system to relevant authorities • Apply emergency rescue techniques during fire hazard • Apply first aid and bandage to victims • Illustrate the steps to free a person from electrocution, and artificial respiration and the CPR Process • Demonstrate correct use of fire extinguishers at the time of emergency • Illustrate the administration of basic first-aid at the time of emergency • Use defined emergency procedures such as raising alarm, safe/efficient, evacuation, correct means of escape and so on • Use protective equipment suitable to tasks and work conditions • Demonstrate correct posture while sitting, standing, and handling heavy materials • Comply with the procedures for minimising waste and processes specified for disposal of hazardous waste
Classroom Aids:	
White board/ black board marker / chalk, duster, computer or Laptop attached to LCD projector	

Tools, Equipment and Other Requirements
Personal Protection Equipment: safety glasses, head protection, rubber gloves, safety footwear, warning signs and tapes, fire extinguisher and first aid kit

Annexure

Trainer Requirements

Trainer Prerequisites						
Minimum Educational Qualification	**Specialization**	**Relevant Industry Experience**		**Training Experience**		**Remarks**
		Years	***Specialization***	***Years***	***Specialization***	
12th pass	AM/FM Radio Station – Installation & Commissioning	3	AM/FM Radio Station – Installation & Commissioning	2-3	AM/FM Radio Station – Installation & Commissioning	**NA**

Trainer Certification	
Domain Certification	**Platform Certification**
Certified for Job Role: "Installation and Commissioning Technician (AM/FM Radio Station)" mapped to QP: "IAS/Q0204". Minimum accepted score is 80%	Recommended that the Trainer is certified for the Job Role: "Trainer", mapped to the Qualification Pack: "MEP/Q2601".Minimum accepted score is 80%

Assessor Requirements

Assessor Prerequisites						
Minimum Educational Qualification	**Specialization**	**Relevant Industry Experience**		**Training Experience**		**Remarks**
		Years	***Specialization***	***Years***	***Specialization***	
12th pass	AM/FM Radio Station – Installation & Commissioning	3	AM/FM Radio Station – Installation & Commissioning	2-3	AM/FM Radio Station – Installation & Commissioning	**NA**

Assessor Certification	
Domain Certification	**Platform Certification**
Certified for Job Role: "Installation and Commissioning Technician (AM/FM Radio Station)" mapped to QP: "IAS/Q0204". Minimum accepted score is 80%	Recommended that the Trainer is certified for the Job Role: "Assessor", mapped to the Qualification Pack: "MEP/Q2701". Minimum accepted score is 80%

Assessment Strategy

1. Assessment System Overview:

    - Batches assigned to the assessment agencies for conducting the assessment on SDSM/SIP or email
    - Assessment agencies send the assessment confirmation to VTP/TC looping SSC
    - Assessment agency deploys the ToA certified Assessor for executing the assessment
    - SSC monitors the assessment process & records

2. Testing Environment:

    - Confirm that the centre is available at the same address as mentioned on SDMS or SIP
    - Check the duration of the training.
    - Check the Assessment Start and End time to be as 10 a.m. and 5 p.m.
    - If the batch size is more than 30, then there should be 2 Assessors.
    - Check that the allotted time to the candidates to complete Theory & Practical Assessment is correct.
    - Check the mode of assessment—Online (TAB/Computer) or Offline (OMR/PP).
    - Confirm the number of TABs on the ground are correct to execute the Assessment smoothly.
    - Check the availability of the Lab Equipment for the particular Job Role.

3. Assessment Quality Assurance levels / Framework:

    - Question papers created by the Subject Matter Experts (SME)
    - Question papers created by the SME verified by the other subject Matter Experts
    - Questions are mapped with NOS and PC
    - Question papers are prepared considering that level 1 to 3 are for the unskilled & semi-skilled individuals, and level 4 and above are for the skilled, supervisor & higher management
    - Assessor must be ToA certified & trainer must be ToT Certified
    - Assessment agency must follow the assessment guidelines to conduct the assessment

4. Types of evidence or evidence-gathering protocol:
    - Time-stamped & geotagged reporting of the assessor from assessment location
    - Center photographs with signboards and scheme specific branding
    - Biometric or manual attendance sheet (stamped by TP) of the trainees during the training period
    - Time-stamped & geotagged assessment (Theory + Viva + Practical) photographs & videos

5. Method of verification or validation:
    - Surprise visit to the assessment location
    - Random audit of the batch
    - Random audit of any candidate

6. Method for assessment documentation, archiving, and access
    - Hard copies of the documents are stored
    - Soft copies of the documents & photographs of the assessment are uploaded / accessed from Cloud Storage
    - Soft copies of the documents & photographs of the assessment are stored in the Hard Drives