



# Model Curriculum

**QP Name: Compressor Operator**

Underground Metal/ Open Cast/ Underground Coal/ Rare Earth

**QP Code: MIN/Q3204**

**QP Version: 2.0**

**NSQF Level: 4**

**Model Curriculum Version: 2.0**



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## Training Parameters

<b>Sector</b>	Mining
<b>Sub-Sector</b>	Engineering Services
<b>Occupation</b>	Mechanical Services
<b>Country</b>	India
<b>NSQF Level</b>	4
<b>Aligned to NCO/ISCO/ISIC Code</b>	NCO-2015/3132.0300, NCO-2015/3132.0700
<b>Minimum Educational Qualification and Experience</b>	8th grade pass plus 2-year NTC plus 1 Year NAC OR 8th pass plus 1-year NTC plus 1-Year NAC plus CITS OR 10th grade pass and pursuing continuous schooling OR 10th grade pass with 2 years relevant experience OR Previous relevant Qualification (Jr. Compressor Operator) of NSQF Level 3.0 with minimum education as 5th Grade pass with 2 years relevant experience
<b>Pre-Requisite License or Training</b>	NA
<b>Minimum Job Entry Age</b>	20 years
<b>Last Reviewed On</b>	28/04/2022
<b>Next Review Date</b>	28/04/2025
<b>NSQC Approval Date</b>	28/04/2022
<b>QP Version</b>	2.0
<b>Model Curriculum Creation Date</b>	28/04/2022
<b>Model Curriculum Valid Up to Date</b>	28/04/2025
<b>Model Curriculum Version</b>	2.0
<b>Minimum Duration of the Course</b>	540 hours
<b>Maximum Duration of the Course</b>	540 hours

# 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 will be able to:

- Discuss how to recognize processes and equipment requirement for Compressor Operations
- Show how to prepare the compressor and related apparatus
- Demonstrate how to operate the compression apparatus
- Explain health, safety and environmental guidelines to be followed for underground Metalliferous mine
- Explain health, safety and environmental guidelines to be followed for underground mines
- Explain health, safety and environmental guidelines to be followed for open cast mines
- Explain health, safety and environmental guidelines to be followed for underground coal mines
- Explain health, safety and environmental guidelines to be followed for rare earth chemical plants

## Compulsory Modules

The table lists the modules, their duration and mode of delivery.

NOS and Module Details	Theory Duration	Practical Duration	On-the-Job Training Duration (Mandatory)	On-the-Job Training Duration (Recommended)	Total Duration
<b>Bridge Module(s)</b>	<b>10:00</b>	<b>00:00</b>	<b>00:00</b>		<b>10:00</b>
Module 1 - Introduction to the sector and the job role of <b>Compressor Operator</b>	10:00	00:00	00:00		10:00
<b>MIN/N3213: Recognize processes and equipment requirement for Compressor Operations</b> NOS Version No. 1 NSQF Level-4	<b>30:00</b>	<b>40:00</b>	<b>10:00</b>		<b>80:00</b>
Module 2: Recognize processes and equipment requirement for Compressor Operations	30:00	40:00	10:00		80:00
<b>MIN/N3214: Prepare the compressor and related apparatus</b> NOS Version No.1 NSQF Level-4	<b>30:00</b>	<b>40:00</b>	<b>50:00</b>		<b>120:00</b>
Module 3: Prepare the compressor and related apparatus	30:00	40:00	50:00		120:00

<b>MIN/N3215: Operate the compression apparatus</b> NOS Version No.1 NSQF Level-4	<b>30:00</b>	<b>50:00</b>	<b>100:00</b>		<b>180:00</b>
Module 4: Operate the compression apparatus	30:00	50:00	100:00		180:00
<b>DGT/VSQ/N0102: Employability Skills (60 Hours)</b> NOS Version No. 1 NSQF Level- 4	<b>24:00</b>	<b>36:00</b>	<b>00:00</b>	-	<b>60:00</b>
Introduction to Employability Skills	00:30	01:00	00:00	-	01:30
Constitutional values - Citizenship	00:30	01:00	00:00	-	01:30
Becoming a Professional in the 21st Century	01:00	01:30	00:00	-	02:30
Basic English Skills	04:00	06:00	00:00	-	10:00
Career Development & Goal Setting	01:00	01:00	00:00	-	02:00
Communication Skills	02:00	03:00	00:00	-	05:00
Diversity & Inclusion	01:00	01:30	00:00	-	02:30
Financial and Legal Literacy	02:00	03:00	00:00	-	05:00
Essential Digital Skills	04:00	06:00	00:00	-	10:00
Entrepreneurship	03:00	04:00	00:00	-	07:00
Customer Service	02:00	03:00	00:00	-	05:00
Getting Ready for Apprenticeship & Jobs	03:00	05:00	00:00	-	08:00
<b>Total Duration</b>	<b>124:00</b>	<b>166:00</b>	<b>160:00</b>	-	<b>450:00</b>

### Elective Modules- (mandatory to select at least one)

The table lists the elective modules, their duration and mode of delivery.

#### Elective 1: Underground Metal

NOS and Module Details	Theory Duration	Practical Duration	On-the-Job Training Duration (Mandatory)	On-the-Job Training Duration (Recommended)	Total Duration
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<b>MIN/N1702: Follow Health, Safety and Environmental Guidelines for Underground Metalliferous Mines UMM (Including Mine Vocational Training Rule and Mine Rescue Rule) NOS Version No. 1.0 NSQF Level-4</b>	<b>40:00</b>	<b>20:00</b>	<b>30:00</b>		<b>90:00</b>
Module 5: Follow Health, Safety and Environmental Guidelines for Underground Metalliferous Mines	40:00	20:00	30:00		90:00
<b>Total Duration</b>	<b>40:00</b>	<b>20:00</b>	<b>30:00</b>		<b>90:00</b>

### Elective 2: Open Cast

<b>NOS and Module Details</b>	<b>Theory Duration</b>	<b>Practical Duration</b>	<b>On-the-Job Training Duration (Mandatory)</b>	<b>On-the-Job Training Duration (Recommended)</b>	<b>Total Duration</b>
<b>MIN/N1703 : Follow Health, Safety and Environmental Guidelines for Opencast Mines (Including Mine Vocational Training Rule) NOS Version No. 1.0 NSQF Level-4</b>	<b>40:00</b>	<b>20:00</b>	<b>30:00</b>		<b>90:00</b>
Module 6: Follow Health, Safety and Environmental Guidelines for Opencast Mines	40:00	20:00	30:00		90:00
<b>Total Duration</b>	<b>40:00</b>	<b>20:00</b>	<b>30:00</b>		<b>90:00</b>

### Elective 3: Underground Coal

NOS and Module Details	Theory Duration	Practical Duration	On-the-Job Training Duration (Mandatory)	On-the-Job Training Duration (Recommended)	Total Duration
<b>MIN/N1704: Follow Health, Safety and Environmental Guidelines for Underground Coal Mines (Including Mine Vocational Training Rule and Mine Rescue Rule)</b> NOS Version No. 1.0 NSQF Level-4	40:00	20:00	30:00		90:00
Module 7: Follow Health, Safety and Environmental Guidelines for Underground Coal Mines	40:00	20:00	30:00		90:00
<b>Total Duration</b>	<b>40:00</b>	<b>20:00</b>	<b>30:00</b>		<b>90:00</b>

### Elective 4: Rare Earth

NOS and Module Details	Theory Duration	Practical Duration	On-the-Job Training Duration (Mandatory)	On-the-Job Training Duration (Recommended)	Total Duration
<b>MIN/N1705: Follow Health, Safety and Environmental guidelines for Rare Earth (RE) Chemicalplant</b> NOS Version No. 1.0 NSQF Level-4	40:00	20:00	30:00		90:00
Module 8: Follow Health, Safety and Environmental guidelines forRare Earth (RE) Chemical plant	40:00	20:00	30:00		90:00
<b>Total Duration</b>	<b>40:00</b>	<b>20:00</b>	<b>30:00</b>		<b>90:00</b>

## Module Details

### Module 1: Introduction to the sector and the job role of Dewatering pump operator

#### Bridge Module

#### Terminal Outcomes:

- Discuss the scope of mining industry
- Explain the role and responsibility of the compressor operator

<i>Duration:10:00</i>	<i>Duration: 00:00</i>
<b>Theory – Key Learning Outcomes</b>	<b>Practical – Key Learning Outcomes</b>
<ul style="list-style-type: none"> <li>• Describe the concept of Underground and Opencast Mining Process</li> <li>• Discuss the characteristic features of Metal mines, Coal Mines and rare earth chemical plants</li> <li>• Discuss the role and the importance of the compressor operator</li> <li>• Explain various types of risks and hazards involved in Mines</li> <li>• Discuss Regulatory context specified to work in Mines</li> <li>• Explain provision of wages, working hours and accident compensation</li> </ul>	
<b>Classroom Aids</b>	
LCD Projector, Laptop/Computer with internet, White Board, Flip Chart, Markers	
<b>Tools, Equipment and Other Requirements</b>	
Posters for describing different types of mines and associated processes.	



## Module 2: Recognize processes and equipment requirement for Compressor Operations

Mapped to MIN/N3213, v1.0

### Terminal Outcomes:

- Discuss how to recognize processes and equipment required for Compressor Operations

<i>Duration:30:00</i>	<i>Duration:40:00</i>
<b>Theory – Key Learning Outcomes</b>	<b>Practical – Key Learning Outcomes</b>
<ul style="list-style-type: none"> <li>• Discuss about different types of mines and detail of the mine he is working in.</li> <li>• Explain how to maintain and operate right compression methodology conversant with use as per defined Standard Operating Procedures specified by the equipment manufacturer and statutory requirements.</li> <li>• Discuss about mine organisation, time keeping, need for discipline and punctuality.</li> <li>• Illustrate galleries in underground mine, dressing of roof, stable and unstable strata etc.</li> <li>• Discuss about the standing orders in force at the mine.</li> <li>• Throw light on the duties of workmen.</li> <li>• Illustrate how to ensure proper use, operation and maintenance of the compressor/ machine provided for operation and required output.</li> <li>• Throw light on the provision of wages, working hours and accident compensation as per Mines Act.</li> <li>• Illustrate the mine organisation and reporting hierarchy.</li> <li>• Discuss about blasting and safety regulations.</li> <li>• Elucidate the mining safety procedures.</li> <li>• Illuminate on the impact of violation of safety procedures.</li> <li>• Discuss about the standard operating procedures (SOP) followed in the company.</li> <li>• Throw light on the processes like Procurement, Store management, inventory management, quality management and key contact points for query resolution.</li> <li>• Discuss about different types of compression processes (reciprocating, rotary etc.) and associated equipment.</li> </ul>	<ul style="list-style-type: none"> <li>• Demonstrate how to check the material required and the equipment availability for executing the activity.</li> <li>• Show how to map the amount of compressed air needed in mine operation to drive varied pneumatic tools, hoists and other machine equipment.</li> <li>• Demonstrate how to set the parameters like temperature, pressure, process cycle time etc. before starting the process, as mentioned in the work Instructions/ SOP manual.</li> <li>• Show how to check the different components and safety features fitted in the machine.</li> <li>• Apply appropriate techniques to deal with safety hazards in the compression process and take precautionary measures.</li> <li>• Role-play a situation to interact with supervisor / Mine Sirdar / foreman about the planned work.</li> </ul>

- Elucidate application, quality and quantity of compressed air required for varied equipment in the industry.
- Discuss about the power sources (driving systems) electrical systems and mechanical driving systems.
- Illustrate normal vibration and sound level of the machine.
- Throw light on hazards and safety aspects involved in compression activities and usage of relevant PPEs (Personal Protective Equipment) and 5s around the work area.
- Describe the applications of compressed air in underground mines, including drilling short holes (especially for strata bolting), for pumping, for small tools (e.g. impact wrenches, power hacksaws, etc.) and occasionally for traction and for auxiliary ventilation (air fans or venturi's).
- Enlist different types of valves and their functioning (stop valve, non-return valve etc.)
- Discuss about gauges, dials, monitoring apparatus and their purpose.
- Discuss about power sources (driving systems) electrical systems & mechanical driving systems.
- Throw light on the impact of various physical parameters like temperature, pressure, etc. on the properties of final output.
- Illustrate the safety measures to be taken.

#### Classroom Aids

LCD Projector, Laptop/Computer with internet, White Board, Flip Chart, Markers

#### Tools, Equipment and Other Requirements

Multi Meter, Hydrometer, Power supply, Torque Wrenches ,Engine Assembly (Petrol Or Diesel), Cut model of engine assembly, Model of transmission system, Wrench, Grease, Pump, Hydraulic Jack, Diff Size of Spanner, Allen Key Set, Calliper Inside / Outside, centre Punch, Screw Driver, Hammer, file set, Screw Driver Set, Lathe Machine, Drill Machine, Milling machine, LCD Projector, Fire Extinguisher Cylinders, First Aid Box, Fire Fighting Charts, First Aid Charts Helmet, Dust Mask, Goggles, Ear Plug Gloves, Reflective Jacket, Safety Belt Gum Boots/ Safety shoes

## Module 3: Prepare the compressor and related apparatus

Mapped to MIN/N3214, v1.0

### Terminal Outcomes:

- Demonstrate how to conduct pre-operation check
- Show how to set up the equipment

<i>Duration:30:00</i>	<i>Duration:40:00</i>
<b>Theory – Key Learning Outcomes</b>	<b>Practical – Key Learning Outcomes</b>
<ul style="list-style-type: none"> <li>• Describe different types of mines and detail of the mine he is working in.</li> <li>• Discuss about mine organisation, time keeping, need for discipline and punctuality.</li> <li>• Elucidate galleries in underground mine, dressing of roof, stable and unstable strata etc.</li> <li>• Illustrate mine organisation and reporting hierarchy.</li> <li>• Explain about blasting and safety regulations.</li> <li>• Discuss about provision of Mines Act with reference to work site, safe working practices and precautionary measures to be taken before, during and after work execution.</li> <li>• Throw light on the standing orders in force at the mine.</li> <li>• Illuminate on the duties of workmen (KU8)</li> <li>• Throw light on the provision of wages, working hours and accident compensation as per Mines Act.</li> <li>• Discuss how to ensure periodic testing of compressed air line for rated pressure and of standard quality.</li> <li>• Summarize the mining safety procedures.</li> <li>• Discuss how to ensure approximate compressed air demand by different air tools connected to the line, including number of drilling machine, air hoists, ventilation system etc.</li> <li>• Illuminate on the impact of violation of safety procedures.</li> <li>• Discuss about the standard operating procedures (SOP) followed in the company.</li> <li>• Throw light on the processes like Procurement, Store management, inventory management, quality</li> </ul>	<ul style="list-style-type: none"> <li>• Demonstrate how to ensure correct oil level, status of the receiver with safety valve, air gauge, fuel level, radiator coolant, engine condition and condition of the drain cock/water trap, distribution system etc.</li> <li>• Show how to check for cracks, defects and anomalies in the compression apparatus.</li> <li>• Apply appropriate techniques to perform condition monitoring of the equipment as specified by the equipment manufacturer.</li> <li>• Demonstrate how to check for condition of piping on both suction and discharge sides.</li> <li>• Show how to check the condition of couplings in the equipment.</li> <li>• Demonstrate how to check electrical connections, and electrical system for proper functioning of the system.</li> <li>• Display how to check condition of engine for diesel operated compressor for the smooth operation of the pump drive.</li> <li>• Demonstrate how to check for cracks, leakage, seepage and oil spilling etc. in the compressor, receiver and distribution line.</li> <li>• Apply appropriate techniques to check for risk of any fire, bursting and collapse or production of any noxious gases.</li> <li>• Show how to check the material required and the equipment availability for executing the activity.</li> <li>• Demonstrate how to check the required material and tools before the start of the operations.</li> <li>• Display how to conduct necessary housekeeping around the work area to minimize risk of any mishap –e.g. fire, slippage etc.</li> <li>• Apply appropriate techniques to set-up the apparatus as per the selected process and the internal SOPs/ Work Instructions and the setting standard for the machine.</li> </ul>

<p>management and key contact points for query resolution.</p> <ul style="list-style-type: none"> <li>• Discuss about different types of compression processes (reciprocating, rotary, etc.) and associated equipment such as single stage and multi stage air compressors; different types of intercoolers.</li> <li>• Discuss about different types of suction and delivery valves, pressure relief valve, safety valve, drain valve.</li> <li>• Explain how to ensure the cleaning of the machine and its auxiliaries (compressor engines, accessories and auxiliary equipment), as mentioned in the Work Instructions/ Standard Operating Procedures (SOP).</li> <li>• Discuss about water separator, oil separator, mist lubricator.</li> <li>• Discuss about different types of inlet air filters, pressure gauge.</li> <li>• Illustrate periodical pressure test of air receiver as per statute.</li> <li>• Throw light on the application, quality and quantity of compressed air required for varied equipment in the industry.</li> <li>• Discuss about the power sources (driving systems) electrical systems and mechanical driving systems.</li> <li>• Explain normal vibration and sound level of the machine.</li> <li>• Discuss about the application of compressed air in the surface and subsurface mines, for power drilling and piling machinery, pneumatic tools, material conveyors and ventilation systems.</li> <li>• List different types of valves and their functioning (stop valve, non-return valve etc.)</li> <li>• Articulate the impact of various physical parameters like temperature, pressure, etc. on the properties of final output.</li> <li>• Describe the basic principles of safety and 5S around the work area.</li> <li>• Tell machine body temperature without thermometer.</li> <li>• Discuss about assessment of normal operating speed.</li> </ul>	
<p><b>Classroom Aids</b></p>	
<p>LCD Projector, Laptop/Computer with internet, White Board, Flip Chart, Markers</p>	
<p><b>Tools, Equipment and Other Requirements</b></p>	



Multi Meter, Hydrometer, Power supply, Torque Wrenches ,Engine Assembly (Petrol Or Diesel), Cut model of engine assembly, Model of transmission system, Wrench, Grease, Pump, Hydraulic Jack, Diff Size of Spanner, Allen Key Set, Calliper Inside / Outside, centre Punch, Screw Driver, Hammer, file set, Screw Driver Set, Lathe Machine, Drill Machine, Milling machine, LCD Projector, Fire Extinguisher Cylinders, First Aid Box, Fire Fighting Charts, First Aid Charts Helmet, Dust Mask, Goggles, Ear Plug Gloves, Reflective Jacket, Safety Belt Gum Boots/ Safety shoes

## Module 4: Operate the compression apparatus

Mapped to MIN/N3215, v1.0

### Terminal Outcomes:

- Demonstrate how to operate compressor
- Show how to perform basic maintenance

<i>Duration:30:00</i>	<i>Duration:50:00</i>
<b>Theory – Key Learning Outcomes</b>	<b>Practical – Key Learning Outcomes</b>
<ul style="list-style-type: none"> <li>• Describe different types of mines and detail of the mine he is working in.</li> <li>• Discuss about mine organisation, time keeping, need for discipline and punctuality.</li> <li>• Elucidate galleries in underground mine, dressing of roof, stable and unstable strata etc.</li> <li>• Explain standing orders in force at the mine. Safety in the vicinity of machinery.</li> <li>• Describe the duties of workmen.</li> <li>• Discuss about provision of wages, working hours and accident compensation as per Mines Act.</li> <li>• Describe mining safety procedures.</li> <li>• Illuminate on the impact of violation of safety procedures.</li> <li>• Discuss about relevant manufacturing standard and procedures followed in the company.</li> <li>• Throw light on the processes like Procurement, Store management, inventory management, quality management and contact points for query resolution.</li> <li>• Summarize the quality norms and standard prescribed in the Quality Manual by the organization for welding.</li> <li>• Describe different types of compression processes and associated equipment.</li> <li>• Discuss about various National and International standard, and statutory provisions, laws and by laws related to compressed gases handling in Mining sector in India.</li> <li>• Explain the physical/chemical properties of gases.</li> <li>• Discuss about the power sources (driving systems) electrical systems &amp; mechanical driving systems.</li> </ul>	<ul style="list-style-type: none"> <li>• Demonstrate how to clean any oil, grease and water seepage and leakage.</li> <li>• Show how to carry out daily lubrication and greasing.</li> <li>• Apply appropriate techniques to clean inlet filter, water separator, oil separator etc.</li> <li>• Show how to check level of coolant, lubricant oil, top up lubricant oil and clean air filter for diesel compressor.</li> <li>• Demonstrate how to check for operation of core equipment like compressor engines, accessories and auxiliary and safety equipment as per setup documentation and conduct preliminary operation when fully satisfied with the physical check.</li> <li>• Display how to feed gas/air in the compressor as per the defined schedule or as per requirements raised by users of compressed gas/air.</li> <li>• Demonstrate how to monitor meters and pressure gauges to determine consumption rate variations, temperatures, and pressures.</li> <li>• Show how to adjust valves and equipment to obtain specified performance.</li> <li>• Display how to check gas meters, and maintain records of the amounts of gas received and dispensed from holders.</li> <li>• Show how to record instrument readings and operational changes in operating logs/records/report books.</li> <li>• Practice how to take necessary precautions and care in using compressed air because of the possibility of generating sparks with sufficient power to ignite Methane from static electricity.</li> <li>• Show how to note any deviation in compressor vibration, noise and body temperature etc. and inform supervisor of</li> </ul>

<ul style="list-style-type: none"> <li>• Illustrate different types of defects/malfunctioning and their impact on the operating processes.</li> <li>• Describe potential health and safety hazards and related Safety measures.</li> <li>• Explain the precautions to be undertaken during the process.</li> <li>• Classify different types of fasteners, tools and tackles.</li> <li>• Discuss about standard spare parts.</li> <li>• Explain the reasons of bursting of air compressor cylinder and high pressure connectors.</li> <li>• Discuss about compressor prime movers.</li> <li>• Illuminate on the internal combustion (IC) engines.</li> <li>• Explain how to remove air lock in fuel line.</li> <li>• Discuss about electrical drive, lock out switch.</li> <li>• Explain the readings of three phase voltmeter, ampere meter.</li> <li>• Discuss about overload and earth fault, relay setting.</li> </ul>	<p>any inconsistency in the operation, process, quality issues etc.</p> <ul style="list-style-type: none"> <li>• Demonstrate how to move controls and turn valves to start compressor engines, accessories, and auxiliary equipment.</li> <li>• Show how to turn knobs or switches to regulate pressures.</li> <li>• Apply appropriate techniques to clean, lubricate, and adjust equipment, and replace filters and gaskets, using hand tools.</li> <li>• Display how to ensure that proper ventilation around the equipment is maintained and no overheating occurs.</li> <li>• Demonstrate how to monitor condition of equipment by noticing variations in sound, vibration and other parameters.</li> </ul>
<p><b>Classroom Aids</b></p>	
<p>LCD Projector, Laptop/Computer with internet, White Board, Flip Chart, Markers</p>	
<p><b>Tools, Equipment and Other Requirements</b></p>	
<p>Multi Meter, Hydrometer, Power supply, Torque Wrenches ,Engine Assembly (Petrol Or Diesel), Cut model of engine assembly, Model of transmission system, Wrench, Grease, Pump, Hydraulic Jack, Diff Size of Spanner, Allen Key Set, Calliper Inside / Outside, centre Punch, Screw Driver, Hammer, file set, Screw Driver Set, Lathe Machine, Drill Machine, Milling machine, LCD Projector, Fire Extinguisher Cylinders, First Aid Box, Fire Fighting Charts, First Aid Charts Helmet, Dust Mask, Goggles, Ear Plug Gloves, Reflective Jacket, Safety Belt Gum Boots/ Safety shoes</p>	

## Employability Skills (60 Hours)

Mapped to DGT/VSQ/N0102, v1.0

<i>Key Learning Outcomes</i>	
<b>Introduction to Employability Skills</b>	<b>Duration: 1.5 Hours</b>
<ol style="list-style-type: none"> <li>1. Discuss the Employability Skills required for jobs in various industries</li> <li>2. List different learning and employability related GOI and private portals and their usage</li> </ol>	
<b>Constitutional values - Citizenship</b>	<b>Duration: 1.5 Hours</b>
<ol style="list-style-type: none"> <li>3. Explain the constitutional values, including civic rights and duties, citizenship, responsibility towards society and personal values and ethics such as honesty, integrity, caring and respecting others that are required to become a responsible citizen</li> <li>4. Show how to practice different environmentally sustainable practices.</li> </ol>	
<b>Becoming a Professional in the 21st Century</b>	<b>Duration: 2.5 Hours</b>
<ol style="list-style-type: none"> <li>5. Discuss importance of relevant 21st century skills.</li> <li>6. Exhibit 21st century skills like Self-Awareness, Behavior Skills, time management, critical and adaptive thinking, problem-solving, creative thinking, social and cultural awareness, emotional awareness, learning to learn etc. in personal or professional life.</li> <li>7. Describe the benefits of continuous learning.</li> </ol>	
<b>Basic English Skills</b>	<b>Duration: 10 Hours</b>
<ol style="list-style-type: none"> <li>8. Show how to use basic English sentences for everyday conversation in different contexts, in person and over the telephone</li> <li>9. Read and interpret text written in basic English</li> <li>10. Write a short note/paragraph / letter/e-mail using basic English</li> </ol>	
<b>Career Development &amp; Goal Setting</b>	<b>Duration: 2 Hours</b>
<ol style="list-style-type: none"> <li>11. Create a career development plan with well-defined short- and long-term goals</li> </ol>	
<b>Communication Skills</b>	<b>Duration: 5 Hours</b>
<ol style="list-style-type: none"> <li>12. Demonstrate how to communicate effectively using verbal and nonverbal communication etiquette.</li> <li>13. Explain the importance of active listening for effective communication</li> <li>14. Discuss the significance of working collaboratively with others in a team</li> </ol>	
<b>Diversity &amp; Inclusion</b>	<b>Duration: 2.5 Hours</b>
<ol style="list-style-type: none"> <li>15. Demonstrate how to behave, communicate, and conduct oneself appropriately with all genders and PwD</li> <li>16. Discuss the significance of escalating sexual harassment issues as per POSH act.</li> </ol>	
<b>Financial and Legal Literacy</b>	<b>Duration: 5 Hours</b>
<ol style="list-style-type: none"> <li>17. Outline the importance of selecting the right financial institution, product, and service</li> <li>18. Demonstrate how to carry out offline and online financial transactions, safely and securely</li> <li>19. List the common components of salary and compute income, expenditure, taxes, investments etc.</li> <li>20. Discuss the legal rights, laws, and aids</li> </ol>	
<b>Essential Digital Skills</b>	<b>Duration: 10 Hours</b>
<ol style="list-style-type: none"> <li>21. Describe the role of digital technology in today's life</li> <li>22. Demonstrate how to operate digital devices and use the associated applications and features, safely and securely</li> <li>23. Discuss the significance of displaying responsible online behavior while browsing, using various social media platforms, e-mails, etc., safely and securely</li> <li>24. Create sample word documents, excel sheets and presentations using basic features</li> <li>25. Utilize virtual collaboration tools to work effectively</li> </ol>	
<b>Entrepreneurship</b>	<b>Duration: 7 Hours</b>
<ol style="list-style-type: none"> <li>26. Explain the types of entrepreneurship and enterprises</li> <li>27. Discuss how to identify opportunities for potential business, sources of funding and associated financial and legal risks with its mitigation plan</li> <li>28. Describe the 4Ps of Marketing-Product, Price, Place and Promotion and apply them as per requirement</li> </ol>	



29. Create a sample business plan, for the selected business opportunity	
<b>Customer Service</b>	<b>Duration: 5 Hours</b>
30. Describe the significance of analyzing different types and needs of customers 31. Explain the significance of identifying customer needs and responding to them in a professional manner. 32. Discuss the significance of maintaining hygiene and dressing appropriately	
<b>Getting Ready for apprenticeship &amp; Jobs</b>	<b>Duration: 8 Hours</b>
33. Create a professional Curriculum Vitae (CV) 34. Use various offline and online job search sources such as employment exchanges, recruitment agencies, and job portals respectively 35. Discuss the significance of maintaining hygiene and confidence during an interview 36. Perform a mock interview 37. List the steps for searching and registering for apprenticeship opportunities	

### Trainer Requirements

Trainer Prerequisites						
Minimum Educational Qualification	Specialization	Relevant Industry Experience		Training Experience		Remarks
		Years	Specialization	Years	Specialization	
Graduate/CITS	Any discipline	-	-	2	Teaching experience	Prospective ES trainer should: <ul style="list-style-type: none"> <li>• have good communication skills</li> <li>• be well versed in English</li> <li>• have digital skills</li> <li>• have attention to detail</li> <li>• be adaptable</li> <li>• have willingness to learn</li> </ul>
Current ITI trainers	Employability Skills Training (3 days full-time course done between 2019-2022)	-	-	-	-	
Certified current EEE trainers (155 hours)	from Management SSC (MEPSC)	-	-	-	-	
Certified Trainer	Qualification Pack: Trainer (MEP/Q0102)	-	-	-	-	

Trainer Certification	
Domain Certification	Platform Certification
<p>Certified in 60-hour Employability NOS (2022), with a minimum score of <b>80%</b></p> <p><b>OR</b></p> <p>Certified in 120-, 90-hour Employability NOS (2022), with a minimum score of <b>80%</b></p>	<p>MEP/Q2601, v2.0 Trainer (VET and Skills). Minimum accepted score as per SSC guideline is 80%.</p>

### Master Trainer Requirements

Master Trainer Prerequisites						
Minimum Educational Qualification	Specialization	Relevant Industry Experience		Training Experience		Remarks
		Years	Specialization	Years	Specialization	
Graduate/CITS	Any discipline	-	-	3	Employability Skills curriculum training experience with an interest to train as well as orient other peer trainers	<p>Prospective ES Master trainer should:</p> <ul style="list-style-type: none"> <li>• have good communication skills</li> <li>• be well versed in English</li> <li>• have basic digital skills</li> </ul>
Certified Master Trainer	Qualification Pack: Master Trainer (MEP/Q2602	-	-	3	EEE training of Management SSC (MEPSC) (155 hours)	<ul style="list-style-type: none"> <li>• have attention to detail</li> <li>• be adaptable</li> <li>• have willingness to learn</li> <li>• be able to grasp concepts fast and is creative with teaching practices and likes sharing back their learning with others</li> </ul>

Master Trainer Certification	
Domain Certification	Platform Certification
<p>Certified in 60-hour Employability NOS (2022), with a minimum score of <b>90%</b>.</p> <p><b>OR</b></p> <p>Certified in 120-, 90-hour Employability NOS (2022), with a minimum score of <b>90%</b></p>	<p>MEP/Q2602, v2.0 Master Trainer (VET and Skills). Minimum accepted score as per SSC guideline is 90%.</p>

### Assessment Strategy

The trainee will be tested for the acquired skill, knowledge and attitude through formative/summative assessment at the end of the course and as this NOS and MC is adopted across sectors and qualifications, the respective AB can conduct the assessments as per their requirements.

LIST OF TOOLS & EQUIPMENT FOR EMPLOYABILITY SKILLS		
S No.	Name of the Equipment	Quantity
1.	Computer (PC) with latest configurations – and Internet connection with standard operating system and standard word processor and worksheet software (Licensed) (all software should either be latest version or one/two version below)	As required
2.	UPS	As required
3.	Scanner cum Printer	As required
4.	Computer Tables	As required
5.	Computer Chairs	As required
6.	LCD Projector	As required
7.	White Board 1200mm x 900mm	As required

*Note: Above Tools & Equipment not required, if Computer LAB is available in the institute.*

#### Proposed Assessment Strategy/Guidelines:

- Individual assessment agencies will create unique question papers for theory part for each candidate at each examination/training center (as per assessment criteria mentioned above).
- Individual assessment agencies will create unique evaluations for skill practical for every student at each examination/ training center based on these criteria.

## Module 5: Follow Health, Safety and Environmental guidelines for Underground Metalliferous Mines

Mapped to MIN/N1702, v1.0

### Terminal Outcomes:

- Discuss about the worksite health and safety measures, and environmental guidelines

<i>Duration:40:00</i>	<i>Duration:20:00</i>
<b>Theory – Key Learning Outcomes</b>	<b>Practical – Key Learning Outcomes</b>
<ul style="list-style-type: none"> <li>• Explain how to undertake "The Take-5 (Personal Risk Assessment)" before commencement of any work (DGMS Tech. circulars 2/2014).</li> <li>• Discuss how to comply with safety, health and security-related regulations/guidelines at the mine e.g. follow Standard Operating Procedure (SOP) for material handling in underground (U/G) mine, safety guidelines specified by Directorate General of Mine Safety (DGMS).</li> <li>• List the precautions to be followed against U/G electrical appliances.</li> <li>• List appropriate safety practices while traveling on U/G haul roads, in case of post blast fumes and misfire.</li> <li>• Discuss the manufacturer’s instructions for care and safe operation of mine machinery and equipment.</li> <li>• Discuss about various types of gases found in the mine and their effect.</li> <li>• Discuss the laid out procedure to be followed in case of gas detecting alarm signal on leakage of inflammable gases.</li> <li>• Shed light on how to use appropriate PPE as per the requirement.</li> <li>• Discuss how to identify six directional hazards at workplace and take decisions accordingly.</li> <li>• Discuss how to check that roof supporting is as per Systematic Support Plan (SSP) and approved Systematic Support Rules (SSR) while undertaking work in an area.</li> <li>• Discuss how to follow appropriate Standard Operating Procedure while working near any isolated and sealed off area of the mine.</li> <li>• List the different types of machineries used in U/G mines.</li> </ul>	<ul style="list-style-type: none"> <li>• Demonstrate how to operate various types of fire extinguishers to control different types of fire at a worksite when required.</li> <li>• Show how to use self-rescue apparatus, appropriately when required.</li> <li>• Read line diagram of ventilation circuit to identify the working ventilation district, to direct air to the working face.</li> </ul>

- Throw light on provision of medical examination (IME & PME) of person employed as per Mines Rules 1955.
- State the importance of first aid and hygiene.
- Explain how to take precaution against occupational health hazards (like dust, water, mine gases etc.) due to U/G working environment.
- Discuss duties and rights of workers, as well as the safety and occupational health policy of organization.
- Throw light on the selection process of person for rescue training.
- Cite about the isolation and sealed off area of the mine.
- Discuss the various problems/incidents likely to occur and precautions to be taken when handling heavy equipment.
- State the mine safety standard including illumination level, noise levels, dust level, pollutants, etc. at the work-site.
- List the common sources of pollution in the mines and ways to minimize it.
- Discuss how to follow process for reporting any unsafe act/condition in work area to the concerned person.
- Describe how to use underground mine communication system.
- Throw light on how to ensure positive isolation near the work place if applicable.
- Describe about the safety appliances and rescue equipment.
- State how to report any symptoms of illness to the shift-in-charge.
- Outline the role of Internal Safety Organisation, safety committee, workman's inspector and DGMS.
- Discuss the mining area-specific signs, and other safety and emergency signals and the outcome of violation of safety procedures.
- List the role and responsibilities of rescue room and rescue station and how to contact them in case of emergency.
- State the importance of taking shelter at the miner's station during blasting operation.
- Discuss about the safety equipment like safety shoes, safety belt, tight fit clothing, hand gloves, safety goggles, Gas Detector, Safety Lamp, Self-Contained Breathing Apparatus, gum boots, ear plugs, Face Mask, etc. and importance of FAB (Fresh Air Base)

- Describe shot-firing / blasting related safety regulations including taking shelter during blasting.
- Throw light on the emergency response /disaster management plan prepared by the organization as per DGMS guideline.
- Explain the rules and regulations for safety and security while handling hazardous materials.
- Outline the basic provisions in Mines Creche Rules, 1966 (MCR) for females employed in the mines.
- Discuss the importance of sensitization towards different genders and persons with disabilities. (PWD).
- Explain the importance of following infection control policies, '5-S' practices, and waste management.
- Discuss the importance of water/material/energy conservation and management.
- Discuss Safety Management Plan (SMP) and Emergency Management Plan (EMP).
- Explain how to maintain hand hygiene by washing hands with alcohol based sanitisers/soap.
- Elucidate on how to maintain hygiene at the work site and disinfect the machine/tools before and after work/task.
- Discuss the environmental impact of mining related operations and steps to reduce those impacts.
- Throw light on the mineral conservation practices in U/G mining operations to achieve optimum ore or mineral recovery.
- Explain how to ensure that stowing practices produce minimum disturbance to the surface.
- Discuss how to ensure that the subgrade ore is carried out to surface and stacked separately at the earmarked place.
- Explain how to ensure the productivity of the machine for material/fuel conservation.

#### Classroom Aids

LCD Projector, Laptop/Computer with internet, White Board, Flip Chart, Markers

#### Tools, Equipment and Other Requirements

Helmet, gloves, harness, earplugs, Safety Goggles, Noise mask, Safety shoes, Fire extinguisher, Types of log book, First Aid box, MCDR, MCR, Company's SOP; Diagrams showing quarries, overhangs, fencing, etc.; samples of different types of rocks to be encountered; Mines Act; "5-S" Charts; Daily, Weekly, Monthly Maintenance/Defect sheets; Systematic Support Plan (SSP); Systematic Support Rules (SSR); self-rescue apparatus; Line Diagram of Ventilation Circuit; Alcohol based sanitisers; self-



rescue apparatus; Gas Detector, Safety Lamp, Self-Contained Breathing Apparatus, gum boots; Diagrams of Armored face conveyor; Charts of coal mines occupational diseases; CMR; MRR, Company's Safety Management Plan (SMP) and Emergency Management Plan (EMP)

## Module 6: Follow Health, Safety, and Environmental Guidelines for opencastmines

Mapped to MIN/N1703, v 1.0

### Terminal Outcomes:

- Discuss about the worksite health and safety measures and environmental guidelines

<i>Duration:40:00</i>	<i>Duration:20:00</i>
<b>Theory – Key Learning Outcomes</b>	<b>Practical – Key Learning Outcomes</b>
<ul style="list-style-type: none"> <li>• Explain how to comply with safety, health, and security-related regulations/guidelines at the open cast mine and safety instructions given by the workman's inspector.</li> <li>• Describe about various environmental awareness program related to mining, organized by the various government bodies/ company.</li> <li>• Discuss how to follow adequate safety while working at haul roads, heights, overburden dumps, sump area, stockyard, near moving parts, etc.</li> <li>• Recall the safety precautions to be taken while working on sites (sub-station, workshop etc.), with equipment, and conducting welding and cutting operations.</li> <li>• Discuss how to follow appropriate Safe Operating Procedure (SOP) while dealing with explosives.</li> <li>• Illustrate how to respond promptly and appropriately to an accident/ incident or an emergency situation, within limits of the role and responsibility.</li> <li>• Discuss usage of appropriate PPE as per the requirement.</li> <li>• Explain how to maintain hand hygiene by washing hands with alcohol based sanitizers/soap.</li> <li>• Elucidate on how to maintain hygiene at the work site and disinfect the machine/tools before and after work/task.</li> <li>• State how to report any symptoms of illness to the shift-in-charge.</li> <li>• Discuss the safety guidelines specified by Directorate General of Mine Safety (DGMS).</li> <li>• List basic mining terminologies and definitions.</li> <li>• Explain about the means of access and egress from the mines, location of workshop, haul roads and working face including dump yards.</li> </ul>	<ul style="list-style-type: none"> <li>• Show how to provide first aid to an injured person.</li> <li>• Display how to operate various types of fire extinguishers to control different types of fire at a worksite when required.</li> <li>• Role-play the situations on how to assist supervisor for reducing environmental impact caused due to related mining operations.</li> </ul>



- Outline about the shot-firing / blasting related safety regulations including taking shelter during blasting.
- Discuss the duties of workers, working hours and accident compensation as per under The Mines act-1952.
- Throw light on the hierarchy of the reporting.
- Recall the proper documents specific to the machine.
- Discuss about the machine operation, condition of the machine and worksite.
- Throw light on various problems/ incidents and precautions to be taken when handling heavy equipment.
- Throw light on the environmental impact of related opencast mining operations.
- Discuss how to follow the process for collecting, storing and disposing of the hazardous material and waste (like used oil, lubricant, battery, etc.) in compliance with worksite guidelines.
- Explain the process of top soil removal and management and ensure not to mix topsoil with waste in day to day tasks.
- Discuss how to ensure that HEMM is washed at the designated location.
- Illuminate on how to ensure the productivity of the machine for material/fuel conservation.
- Discuss the mineral conservation practices specified by the organization in accordance with MCDR-2017 (Mineral Conservation and Development Rules).
- Discuss the role of workmen inspector, safety committee and internal safety organization.
- Throw light on the signage, mining area-specific signs, and other safety and emergency signals.
- State the outcome of violation of safety procedures.
- Summarise the importance of sensitization towards different genders and PWD (Persons with Disabilities).
- Throw light on mine sump and pumping system of the mines.
- State the mine safety standard including illumination level, noise levels, dust level, pollutants, etc. at the work-site.
- List the common sources of pollution in the mines and ways to minimize it.

<ul style="list-style-type: none"> <li>• Enlist the safety equipment like safety shoes, safety belt, tight fit clothing, hand gloves, safety goggles, gas detector, safety lamp, self-contained breathing apparatus, gum boots, ear plugs, face mask, etc.</li> <li>• Discuss emergency response /disaster management plan prepared by the organization.</li> </ul>	
<p><b>Classroom Aids</b></p>	
<p>LCD Projector, Laptop/Computer with internet, White Board, Flip Chart, Markers</p>	
<p><b>Tools, Equipment and Other Requirements</b></p>	
<p>Helmet, gloves, harness, earplugs, Safety Goggles, Node mask, Safety shoes, Fire extinguisher, Types of log book, First Aid box, MCDR, MCR, Company’s SOP; Diagrams showing quarries, overhangs, fencing, etc.; samples of different types of rocks to be encountered; Mines Act; “5-S” Charts; Daily, Weekly, Monthly Maintenance/Defect sheets; Systematic Support Plan (SSP); Systematic Support Rules (SSR); self-rescue apparatus; Line Diagram of Ventilation Circuit; Alcohol based sanitizers; self-rescue apparatus; Gas Detector, Safety Lamp, Self-Contained Breathing Apparatus, gum boots; Diagrams of Armoured face conveyor; Charts of coal mines occupational diseases; CMR; MRR, Company’s Safety Management Plan (SMP) and Emergency Management Plan (EMP)</p>	

## Module 7: Follow Health, Safety, and Environmental guidelines for underground coal mines

Mapped to MIN/N1704, v1.0

### Terminal Outcomes:

- Follow worksite health and safety measures
- Follow environmental Guidelines

<i>Duration:40:00</i>	<i>Duration:20:00</i>
<b>Theory – Key Learning Outcomes</b>	<b>Practical – Key Learning Outcomes</b>
<ul style="list-style-type: none"> <li>• List the preventive measures against firedamp, white damp, blackdamp etc.</li> <li>• Explain how to undertake "The Take-5 (Personal Risk Assessment)" before commencement of any work (DGMS Tech. circulars 2/2014).</li> <li>• Discuss how to check that roof supporting is as per Systematic Support Plan (SSP) and approved Systematic Support Rules (SSR while undertaking work in an area.</li> <li>• Throw light on various types of gases available in the mine and their effects; and their control measures.</li> <li>• Discuss how to comply with safety, health and security-related regulations/guidelines at the mine e.g. SOP for material handling in underground (U/G) mine.</li> <li>• Describe how to ensure that oil, grease, canvas or other inflammable material are stored in fire-proof receptacle.</li> <li>• List the safety precautions to be followed against spontaneous heating of the coal.</li> <li>• Discuss how to ensure that no person is traveling / working/ staying under unsupported roof.</li> <li>• Throw light on how to take precaution against occupational health hazards (like dust, water, mine gases etc.) due to U/G working environment.</li> <li>• Discuss Safety Management Plan (SMP) and Emergency Management Plan (EMP) and precautions against U/G electrical appliances.</li> <li>• Discuss the safety guidelines specified by Directorate General of Mine Safety (DGMS) and selection process of person for rescue training.</li> <li>• Elucidate on how to take proper care against damage and accidents while loading,</li> </ul>	<ul style="list-style-type: none"> <li>• Show how to use the flame safety lamp for detecting the methane gas as per Standard Operating Procedure (SOP).</li> <li>• Demonstrate how to operate various types of fire extinguishers to control different types of fire at worksite, if required.</li> <li>• Display how to use self-rescue apparatus appropriately when required.</li> <li>• Read the line diagram of ventilation circuit to identify the working ventilation district to direct air to the working face.</li> <li>• Apply appropriate techniques to ensure that every instrument, apparatus and equipment are DGMS approved before these are used.</li> <li>• Demonstrate how to ensure that Armoured face conveyor (AFC) and chocks must be kept in straight line for every cycle of operations and tightened up to the setting pressure while keeping it in full contact with the roof, applicable for longwall mining.</li> <li>• Show how to provide first aid to an injured person.</li> <li>• Role-play the situations on how to report any symptoms of illness to the shift-incharge.</li> </ul>

transporting, dismantling and erecting of roof supports.

- Throw light on how to follow appropriate SOP while working near any isolated and sealed off area of the mine.
- Discuss the provision of medical examination (Initial Medical Examination (IME) & Periodical Medical Examination (PME)) of a person employed, as per Mines Rules 1955.
- List different types of machineries used in U/G mines.
- Enlist different types of supporting system used in U/G mines as per SSP and SSR.
- Cite precautions to be taken when handling heavy equipment.
- Discuss how to ensure that the roof and sidewalls of the mine face (or newly exposed area of the mines) have been scaled/ dressed properly.
- List relevant safety precautions to be taken during depillaring operation in UCM.
- Recall the safety precautions to be followed while traveling on U/G haul roads, incase of post blast fumes and misfire.
- Discuss the manufacturer's instructions for care and safe operation of mine machinery and equipment.
- Throw light on the laid out SOP in case of alarm signal for leakage of inflammable gases.
- Explain the process of reporting any unsafe act/condition in the working area to the concerned person.
- Discuss how to use underground mine communication system.
- Elucidate how to ensure positive isolation near the work place if applicable.
- Discuss how to use appropriate Personal Protective Equipment (PPE) as per the requirement and safety equipment.
- Explain how to maintain hand hygiene by washing hands with alcohol based sanitisers/soap, disinfect the machine/tools before and after work/task and maintain hygiene at the work site.
- Discuss how to identify six directional hazards at workplace and take decisions accordingly.
- Discuss the environmental impact of mining related operations and steps to reduce those impacts.

- Throw light on the mineral conservation practices in U/G mining operations to achieve optimum ore or mineral recovery.
- Describe how to ensure that the stowing practices produce minimum disturbance to the surface.
- Summarise how to ensure that the subgrade coal is carried out to surface and stacked separately at the earmarked place.
- Throw light on how to ensure the productivity of the machine for material/fuel conservation.
- Outline the process for collecting, storing and disposing of the hazardous material and waste (like used oil, lubricant, battery, etc.) in compliance with worksite guidelines.
- Discuss the "5-S" practice at work site like cleaning oil from ground (to avoid soil from getting damaged), etc.
- Discuss the duties and rights of workers.
- List the various problems/incidents likely to occur.
- Throw light on the role of Internal Safety Organization, safety committee, workman's inspector and DGMS.
- State mine safety standard including light illumination level, noise levels, dust level, pollutants, etc. at the work-site.
- List common sources of pollution in the mines and ways to minimize it.
- Discuss shot-firing / blasting related safety regulations including taking shelter during blasting.
- Recall mining area-specific signs, and other safety and emergency signals.
- Discuss the outcome of violation of safety procedures.
- List safety appliances and rescue equipment.
- Discuss the safety and occupational health policy of organisation.
- Explain the importance of FAB (Fresh Air Base).
- State basic provisions in Mines Creche Rules, 1966 (MCR) for any females employed in the mines.
- Discuss about basic safety regulations of Coal Mines Regulation, 2017 (CMR).
- List types of stone dust barrier and its importance.
- Explain coal dust explosion and its preventive measures.

<ul style="list-style-type: none"> <li>• Outline the classification of coal mines as per the degree of gassiness of coal seams such as first degree, second degree, and third-degree mines.</li> <li>• List the precautions as per the gassiness of the coal mines.</li> <li>• Discuss about coal mines occupational disease such as pneumoconiosis or 'black lung' and their preventive measures.</li> <li>• List the roles, duties and responsibilities of rescue team members, rescue room and rescue station and how to contact them in case of emergency.</li> <li>• Enlist the correct steps for conducting any rescue work as per Mine Rescue Rule (MRR)</li> <li>• Summarize the importance of sensitization towards different genders and persons with disabilities (PWD).</li> <li>• Discuss the importance of waste management, hazardous material safety, security rules and regulations.</li> <li>• Throw light on importance of water/material/energy conservation and management.</li> </ul>	
<b>Classroom Aids</b>	
LCD Projector, Laptop/Computer with internet, White Board, Flip Chart, Markers	
<b>Tools, Equipment and Other Requirements</b>	
Helmet, gloves, harness, earplugs, Safety Goggles, Node mask, Safety shoes, Fire extinguisher, Types of log book, First Aid box, MCDR, MCR, Company's SOP; Diagrams showing quarries, overhangs, fencing, etc.; samples of different types of rocks to be encountered; Mines Act; "5-S" Charts; Daily, Weekly, Monthly Maintenance/Defect sheets; Systematic Support Plan (SSP); Systematic Support Rules (SSR); self-rescue apparatus; Line Diagram of Ventilation Circuit; Alcohol based sanitisers; self-rescue apparatus; Gas Detector, Safety Lamp, Self-Contained Breathing Apparatus, gum boots; Diagrams of Armoured face conveyor; Charts of coal mines occupational diseases; CMR; MRR, Company's Safety Management Plan (SMP) and Emergency Management Plan (EMP)	

## Module 8: Follow Health, Safety and Environmental guidelines for RareEarth (RE) Chemical plant

Mapped to MIN/N1705, v1.0

### Terminal Outcomes:

- Discuss work site health and safety measures, and environmental guidelines

<i>Duration:40:00</i>	<i>Duration:20:00</i>
<b>Theory – Key Learning Outcomes</b>	<b>Practical – Key Learning Outcomes</b>
<ul style="list-style-type: none"> <li>• Discuss occupational health and safety regulations adopted by the employer.</li> <li>• Talk about Rare Earth (RE) Chemical Plant safety procedures and the outcome of violation of safety procedures.</li> <li>• Recall safety and occupational health policy of organization.</li> <li>• Explain the process for reporting any unsafe act/condition in work area.</li> <li>• Enlist the duties and rights of workers.</li> <li>• Describe the provision of wages, working hours and accident compensation as per Atomic Energy Factory Rules.</li> <li>• Explain different types of Rare Earth (RE) Chemical factories.</li> <li>• List various types of chemical processes carried out in the plant.</li> <li>• Discuss about fencing, guarding, spillage control etc. in relation to Rare Earth (RE) Chemical Plant.</li> <li>• List the correct safety steps in case of accident or major failure.</li> <li>• Enlist safety precautions required while handling cables; working near electrical installations, over headlines and while working with various electrical equipment in the plant.</li> <li>• Discuss the usage of appropriate PPE as per the requirement.</li> <li>• Explain how to maintain hand hygiene by washing hands with alcohol based sanitizers/soap and how to disinfect and maintain hygiene of the site/panel/tools.</li> <li>• Describe how to report any symptoms of illness like COVID etc. to the shift-in charge.</li> <li>• Describe about Internal Safety Organization and role of safety committee, workman’s inspector and AERB.</li> <li>• Explain the importance of ‘5-S’ practices and waste management.</li> </ul>	<ul style="list-style-type: none"> <li>• Demonstrate how to operate various grades of fire extinguishers.</li> <li>• Demonstrate how to provide first-aid to an injured person.</li> <li>• Perform steps for the process of collecting, storing and disposing of the hazardous material and waste (like used oil, lubricant, battery, etc.) in compliance with worksite guidelines and safety guidelines, as prescribed by regulatory authorities like Atomic Energy Regulatory Board (AERB), etc.</li> <li>• Demonstrate installation and handling of safety devices.</li> <li>• Display how to identify the hazards and risks.</li> <li>• Demonstrate how to comply with Safety Management Plan (SMP) and Emergency Management Plan (EMP).</li> <li>• Demonstrate how to identify six directional hazards at workplace and take decisions accordingly.</li> <li>• Apply appropriate techniques to identify the environmental impact of operations related to Rare Earth (RE) Chemical plant and to reduce the impact.</li> <li>• Show how to ensure the productivity of the machine for material/fuel conservation.</li> <li>• Demonstrate the code of practice for safe handling and transport of dangerous material and heavy equipment.</li> </ul>

<ul style="list-style-type: none"><li>• Discuss the importance of water/material/energy conservation and management.</li></ul>	
<b>Classroom Aids</b>	
LCD Projector, Laptop/Computer with internet, White Board, Flip Chart, Markers	
<b>Tools, Equipment and Other Requirements</b>	
Posters describing the process flow for separation of Rare Earths; Reagents- samples; Hydrometer; Handheld pH Meter; Prescribed plant uniform; Safety PPE- Helmet, gloves, harness, earplugs, Safety Goggles, Nose/Face mask, Safety shoes; Fire extinguisher, Types of log book, First Aid box; Slide wrench; Spanner Set; Company's SOPs; Principal components like valves, bends, tees; controls such as switches, inter locks, alarms, etc.; Different types of pumps & valves and control units	



# Annexure

## Trainer Requirements

Trainer Prerequisites						
Minimum Educational Qualification	Specialization	Relevant Industry Experience		Training Experience		Remarks
		Years	Specialization	Years	Specialization	
Class X	NA	6	Relevant experience required in Compressor operation in the field of mining sector.	NA	-	-
<b>OR</b>						
ITI	NA	6	Relevant experience required in Compressor operation in the field of mining sector.	NA	-	-
<b>OR</b>						
Diploma	Mining / Mechanical / Electrical	5	Relevant experience required in Compressor operation in the field of mining sector.	NA	-	-
<b>OR</b>						
B-Tech	Mining / Mechanical / Electrical	4	Relevant experience required in Compressor operation in the field of mining sector.	NA	-	-

Trainer Certification	
Domain Certification	Platform Certification
MIN/Q3204, V 2.0 Compressor Operator. Minimum accepted score as per SSC guideline is 80%.	MEP/Q2601, v2.0 Trainer (VET and Skills). Minimum accepted score as per SSC guideline is 80%.

## Assessor Requirements

Assessor Prerequisites						
Minimum Educational Qualification	Specialization	Relevant Industry Experience		Training Experience		Remarks
		Years	Specialization	Years	Specialization	
Class X	NA	8	Relevant experience required in Compressor operation in the field of mining sector.	NA	-	-
<b>OR</b>						
ITI	NA	8	Relevant experience required in Compressor operation in the field of mining sector.	NA	-	-
<b>OR</b>						
Diploma	Mining / Mechanical / Electrical	7	Relevant experience required in Compressor operation in the field of mining sector.	NA	-	-
<b>OR</b>						
B-Tech	Mining / Mechanical / Electrical	6	Relevant experience required in Compressor operation in the field of mining sector.	NA	-	-

Assessor Certification	
Domain Certification	Platform Certification
MIN/Q3204, V 2.0 Compressor Operator. Minimum accepted score as per SSC guideline is 80%.	MEP/Q2701, v2.0 Assessor (VET and Skills). Minimum accepted score as per SSC guideline is 80%.

## Assessment Strategy

### Assessment system Overview: -

Assessment will be carried out by SCMS affiliated assessment partners. Based on the results of assessment, SCMS certifies the learners. Candidates have to pass online theoretical assessment which is approved by SCMS.

The assessment will have both theory and practical components in 30:70 ratios.

While theory assessment is summative and an online written exam; practical will involve demonstrations of applications and presentations of procedures and other components. Practical assessment will also be summative in nature.

### Testing Environment: -

Training partner has to share the batch start date and end date, number of trainees and the job role.

Assessment is fixed for a day after the end date of training. It could be next day or later. Assessment will be conducted at the training venue.

Question bank of theory and practical will be prepared by assessment agency and approved by SCMS. From this set of questions, assessment agency will prepare the question paper. Theory testing will include multiple choice questions, pictorial question, etc. which will test the trainee on theoretical knowledge of the subject.

The theory and practical assessments will be carried out on same day. If number of candidates are many, more assessors and venue will be organized on same day of the assessment.

Assessment			
Assessment Type	Formative or Summative	Strategies	Examples
Theory	Summative	Written Examination	Knowledge of facts related to the job role and functions. Understanding of principles and concepts related to the job role and functions
Practical	Summative	Structured tasks	Presentation
Viva	Summative	Questioning and Probing	Mock interview on topics

### Assessment Quality Assurance framework

Only certified assessor can be assigned for conducting assessment. Provision of 100 % video recording with clear audio to be maintained and the same is to be submitted to SCMS.

The training partner will intimate the time of arrival of the assessor and time of leaving the venue.



### **Methods of Validation: -**

Unless the trainee is registered, the person cannot undergo assessment. To further ensure that the person registered is the person appearing for assessment, id verification will be carried out. Aadhar card number is required of registering the candidate for training. This will form the basis of further verification during the assessment. Assessor conducts the assessment in accordance with the assessment guidelines and question bank as per the job role. The assessor carries tablet with the loaded questions. This tablet is geo tagged and so it is monitored to check their arrival and completion of assessment. Video of the practical session is prepared and submitted to SCMS. Random spot checks/audit are conducted by SCMS assigned persons to check the quality of assessment. Assessment agency will be responsible to put details in SIP.

SCMS will also validate the data and result received from the assessment agency.

### **Method of assessment documentation and access**

The assessment agency will upload the result of assessment in the portal. The data will not be accessible for change by the assessment agency after the upload. The assessment data will be validated by SCMS assessment team. After upload, only SCMS can access this data. SCMS approves the results within a week and uploads on SIP.

## References

## Glossary

Term	Description
<b>Declarative Knowledge</b>	Declarative knowledge refers to facts, concepts and principles that need to be known and/or understood in order to accomplish a task or to solve a problem.
<b>Key Learning Outcome</b>	Key learning outcome is the statement of what a learner needs to know, understand and be able to do in order to achieve the terminal outcomes. A set of key learning outcomes will make up the training outcomes. Training outcome is specified in terms of knowledge, understanding (theory) and skills (practical application).
<b>OJT (M)</b>	On-the-job training (Mandatory); trainees are mandated to complete specified hours of training on site
<b>OJT (R)</b>	On-the-job training (Recommended); trainees are recommended the specified hours of training on site
<b>Procedural Knowledge</b>	Procedural knowledge addresses how to do something, or how to perform a task. It is the ability to work, or produce a tangible work output by applying cognitive, affective or psychomotor skills.
<b>Training Outcome</b>	Training outcome is a statement of what a learner will know, understand and be able to do <b>upon the completion of the training</b> .
<b>Terminal Outcome</b>	Terminal outcome is a statement of what a learner will know, understand and be able to do <b>upon the completion of a module</b> . A set of terminal outcomes help to achieve the training outcome.

## Acronyms and Abbreviations

Term	Description
QP	Qualification Pack
NSQF	National Skills Qualification Framework
NSQC	National Skills Qualification Committee
NOS	National Occupational Standards
NOS	National Occupational Standards
RE	Rare Earths
SIP	Skill India Portal
SOP	Standard Operating Procedure
SCMS	Skill Council for Mining Sector