

CURRICULUM

FOR THE TRADE OF

OPERATOR LOCOMOTIVE

AND

RAIL CRANES IN STEEL PLANT

UNDER

APPRENTICESHIP TRAINING SCHEME

2017



GOVERNMENT OF INDIA
MINISTRY OF SKILL DEVELOPMENT & ENTREPRENURESHIP
DIRECTORATE GENERAL OF TRAINING

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1. TATA Steel, Jamshedpur

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2. BACKGROUND

2. 1. Apprenticeship Training Scheme under Apprentice Act 1961

The Apprentices Act, 1961 was enacted with the objective of regulating the programme of training of apprentices in the industry by utilizing the facilities available therein for imparting on-the-job training. The Act makes it obligatory for employers in specified industries to engage apprentices in designated trades to impart Apprenticeship Training on the job in industry to school leavers and person having National Trade Certificate(ITI pass-outs) issued by National Council for Vocational Training (NCVT) to develop skilled manpower for the industry. There are four categories of apprentices namely; **trade apprentice, graduate, technician and technician (vocational) apprentices.**

Qualifications and period of apprenticeship training of **trade apprentices** vary from trade to trade. The apprenticeship training for trade apprentices consists of basic training followed by practical training. At the end of the training, the apprentices are required to appear in a trade test conducted by NCVT and those successful in the trade tests are awarded the National Apprenticeship Certificate.

The period of apprenticeship training for graduate (engineers), technician (diploma holders and technician (vocational) apprentices is one year. Certificates are awarded on completion of training by the Department of Education, Ministry of Human Resource Development.

2. 2. Changes in Industrial Scenario

Recently we have seen huge changes in the Indian industry. The Indian Industry registered an impressive growth during the last decade and half. The number of industries in India have increased manifold in the last fifteen years especially in services and manufacturing sectors. It has been realized that India would become a prosperous and a modern state by raising skill levels, including by engaging a larger proportion of apprentices, will be critical to success; as will stronger collaboration between industry and the trainees to ensure the supply of skilled workforce and drive development through employment. Various initiatives to build up an adequate infrastructure for rapid industrialization and improve the industrial scenario in India have been taken.

2. 3. Reformation

The Apprentices Act, 1961 has been amended and brought into effect from 22nd December, 2014 to make it more responsive to industry and youth. Key amendments are as given below:

- Prescription of number of apprentices to be engaged at establishment level instead of trade-wise.

- Establishment can also engage apprentices in optional trades which are not designated, with the discretion of entry level qualification and syllabus.
- Scope has been extended also to non-engineering occupations.
- Establishments have been permitted to outsource basic training in an institute of their choice.
- The burden of compliance on industry has been reduced significantly.

3. RATIONALE

(Need for Apprenticeship in Operator Locomotive and Rail Cranes in Steel Plant trade)

1. Operates traveling crane to lift, move, and position loads, such as machinery, equipment, products, and solid or bulk materials, using hoisting attachments, such as hook, sling, electromagnet, or bucket.
2. Confer with conductors or traffic control center personnel via radiophones to issue or receive information concerning stops, delays or oncoming trains.
3. Inspect locomotives to verify adequate fuel, sand, water, and other supplies before each run, and to check for mechanical problems.
4. Monitor gauges and meters that measure speed, amperage, battery charge, and air pressure in brake lines and in main reservoirs.
5. Observe tracks to detect obstructions.
6. Operate locomotives to transport and to couples and uncouples railroad cars and throws railroad track switches.
7. Manipulates or depresses crane controls, such as pedals, levers, and buttons, to regulate speed and direction of crane and hoist movement according to written, verbal, or signal instructions.
8. Check to ensure that brake examination tests are conducted at shunting stations.
9. Drive diesel-electric rail-detector cars to transport rail-flaw-detecting machines over tracks.
10. Inspect locomotives after runs to detect damaged or defective equipment
11. Cleans and maintains crane and hoisting mechanism.

4. JOB ROLES: REFERENCE NCO

Brief description of Job roles:

Operator Locomotive and Loco crane operate the loco and loco crane at different speed and different track condition safely, Check the loco and loco crane before start, couple and decouple the loco with wagon, check the track condition and communicate with shunting porter and ground man, check the condition of wagon and its components for its fitness, take decision and action in case of track jamming and overloading.

Plan and organize assigned work and detect & resolve issues during execution. Demonstrate possible solutions and agree tasks within the team. Communicate with required clarity and understand technical English. Sensitive to environment, self-learning and productivity.

Perform TPM (Total Production Management), TQM (Total Quality Management) and record keeping system.

Reference NCO:

- i) **NCO-2015: --**

5. GENERAL INFORMATION

1. **Name of the Trade** : **OPERATOR LOCOMOTIVE AND RAIL
CRANES IN STEEL PLANT**

2. **N.C.O. Code No.** : **8162.50, 8333.30**

3. **Duration of Apprenticeship Training (Basic Training + Practical Training):**15
Months

4. **Duration of Basic Training:** -

a) Block –I : 3 months

Total duration of Basic Training: 3 months

5. **Duration of Practical Training (On -job Training):** -

a) Block–I: 12 months

Total duration of Practical Training: 12 months

6. **Entry Qualification** : Passed 10th Class exam.

7. **Selection of Apprentices:** The apprentices will be selected as per Apprenticeship Act amended time to time.

8. **Rebate for ITI passed trainees** : NIL

Note: Industry may impart training as per above time schedule for different block, however this is not fixed. The industry may adjust the duration of training considering the fact that all the components under the syllabus must be covered. However the flexibility should be given keeping in view that no safety aspects is compromised.

6. COURSE STRUCTURE

Training duration details: -

Time (in months)	1-3	4-15
Basic Training	Block- I	-----
Practical Training (On - job training)	----	Block - I

Components of Training ↓	Duration of Training in Months →														
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
Basic Training Block - I															
Practical Training Block - I															

7. SYLLABUS
7.1 BASIC TRAINING
(BLOCK – I)
DURATION: 03 MONTHS

GENERAL INFORMATION

- 1) **Name of the Trade** : **OPERATOR LOCOMOTIVE AND RAIL
CRANES IN STEEL PLANT**
- 2) **Hours of Instruction** : 500 Hrs.
- 3) **Batch size** : 20
- 4) **Power Norms** : 3 KW for Workshop
- 5) **Space Norms** : 70 Sq. m.
- 6) **Examination** : The internal assessment will be held on
completion of each Block.
- 7) **Instructor Qualification** :

i) Degree/Diploma in **Mechanical** Engg. from recognized university/Board with one/two year post qualification experience respectively in the relevant field.

OR

ii) NTC/NAC in the trade of **Operator Locomotive and Rail Cranes in Steel Plant** with three year post qualification experience in the relevant field.
Preference will be given to a candidate with Craft Instructor Certificate (CIC)

- 8) **Tools, Equipments & Machinery required:** - As per Annexure – I

7.1.1 DETAIL SYLLABUS OF CORE SKILL

A. Block– I Basic Training

Topic No.	a) Engineering Drawing	Duration (in hours)	b) Workshop Science & Calculation	Duration (in hours)
		30		20
1.	Introduction to Engineering drawing, its importance and uses in engineering fields. Simple definitions of Points, Lines, Parallel straight lines.		Applied workshop problems involving simple addition, subtraction, multiplication, division and common fractions.	
2.	Geometrical construction of Square, Rectangle, Triangle, Circle, Polygons, etc.		Science- Definition, Nomenclature, various branches, significance and definitions of important terms.	
3.	Drawing different types of lines.		Rounding of decimal values, use of approximation.	
4.	Free hand sketch of Hand tools used in the trade.		Units – Definition, fundamental & derived units, system of units- FPS, CGS, MKS and SI units of some important parameters- Length , mass, time, density, current, voltage, pressure etc. Unit conversion.	
5.	Screw Threads – Forms of Various Screw threads used in general in the industry – Nomenclature, convention		Workshop problems related to average.	
6.	Fastening Devices – Temporary and Permanent. Meaning and difference. Temporary Device – Hexagonal Bolt, Nut, Check Nut, Washer.		Workshop problems related to percentage.	
7.	Different Methods of Preventions of rotation of Bolts - Check nut, Square headed bolt, Square headed bolt with square neck, cup headed bolt, Eye bolt, counter sunk headed bolt, rag bolt, etc.		Workshop problems related to ratio and proportion.	
8.	Different Methods of locking of nuts :- a) Lock nuts, b) Split pin, c) Slotted nut , d) Symmonds nut, e) Castle nut, f) Wings nut, etc.		Workshop problems related on time & work.	
9.	Permanent Fastening Devices- Rivets – different parts and their types Different types of rivet heads.		Profit & Loss and problems concerning to workshop practices.	

10.	Rivets Joints – Lap joint and Butt or Strap joint. Lap Joint – a) Single Riveted, b) Double riveted, i) Chain, ii) zig – zag Butt Joint – a) Single plate or strap, b) Double plate or strap		Properties of Matter- Different types of Properties of Matter e.g. Mechanical, Electrical, Chemical, Magnetic.	
11.	Keys and Cotter Joints, Difference between Keys and Cotters, Different types of Keys.		Properties of Matter (Mechanical) - Tenacity, Toughness, Malleability, Ductility, Elasticity, Plasticity, Brittleness, Hardness (concept & definition)	
12.	---		Properties and uses of copper, zinc, lead, tin, aluminum, brass, bronze, solder, bearing metals, timber, and rubber.	
13.	---		Engineering Material- Introduction, classification, Metallic- Non metallic material, physical and mechanical properties,	
14.	---		Heat & temperature- Definition and its importance. Scales of Temperature, e.g. Fahrenheit, Centigrade, Kelvin- relationship between them.	
15.	---		Transmission of heat- Conduction, Convection and Radiation. Examples from Industries (concept & definition)	
16.	---		Transmission of Power and motion of Belt and Pulleys:- Driver and Follower – Open and Cross belt system of belt drives. Velocity ratio. Power Transmission by belt – Problems	

7.1.2 DETAIL SYLLABUS OF PROFESSIONAL SKILLS & PROFESSIONAL KNOWLEDGE

A. Block –I

Basic Training

Week No.	Professional Skills	Professional Knowledge
1.	<p>Safety: - its importance, classification, personal, general, workshop and job safety. Occupational health and safety.</p> <p>Basic injury prevention, Basic first aid, Hazard identification and avoidance, safety signs for Danger, Warning, caution & personal safety message.</p> <p>Preventive measures for electrical accidents & steps to be taken in such accidents.</p> <p>Importance of housekeeping & good shop floor practices.</p> <p>Disposal procedure of waste materials like cotton waste, metal chips/burrs etc.</p> <p>Fire& safety: Use of Fire extinguishers.</p>	<p>Importance of safety and general precautions observed in the in the industry/shop floor. All necessary guidance to be provided to the new comers to become familiar with the working of Institute system including stores procedures.</p> <p>Introduction of First aid. Safety attitude development of the trainee by educating him to use Personal Protective Equipment (PPE). Response to emergencies eg; power failure, fire, and system failure.</p> <p>Accidents- Definition types and causes. First-Aid, nature and causes of injury and utilization of first-aid.</p> <p>Introduction to 5S concept & its application. Fire: - Types, causes and prevention methods. Fire Extinguisher, its types.</p> <p>Global warming its causes and remedies. Industrial Waste its types, sources and waste Management.</p>
2.	<p>video demo of the related processes</p>	<p>Induction & Safety Training: Company Profile, Significance of Steel Business Plant familiarization, Layout, Product Mix, Objectives. Safety, Health & Environment Awareness Basic skill development training on Use of Tools, Basic Measuring Instruments, Coupling & Alignment, Welding, Gas Cutting.</p>
3.	<p>Video demo of Loco operation and traffic layout processes. Knowledge of speed limit & safety sensor.</p>	<p>Introduction to Loco Operation and Traffic Layout General awareness and Traffic Management, Rail Network and Logistics, Personal Safety and Housekeeping, Derailment and Demurrage</p>
4.	<p>Practice on drives of loco operation an traffic layout.</p>	<p>Introduction to Loco Operation and Traffic Layout Introduction to Locomotives, Construction of Locomotives, A-i) Check before starting prime mover (Engine) ii) Check after starting prime mover (Engine) iii) Check during loco operation</p>

		<p>iv) Check stopping loco operation</p> <p>B- Knowledge of rail track and its components. Operation of Locomotives in Steel Plants, Pre-start Checks, Fire Precautions</p> <p>Shift Takeover, General Precautions during Loco Operation,</p> <p>Types of Emergency situations</p>
5.	Practice on blast furnace hot metal and slag zone.	<p>Operation in Blast Furnace Hot Metal and Slag Zone</p> <p>1. Introduction to different Point Lever, parts of Locomotives, Types of Rolling Stocks.</p> <p>2. Personal safety before start & during Loco operation - a) Use of PPEs (Personal Protective Equipments), b) Fitted clothes c) House Keeping.</p>
6.	-Do-	<p>Types, uses of rolling stocks used in this zone</p> <p>Procedure of drawing out loaded ladle from furnace.</p> <p>Procedure of Placement of Empty ladle to furnace</p> <p>Procedure of drawing out loaded Dump Car from furnace</p>
7.	video demo of the related processes	<p>SMS and Ingot Movement Zone:</p> <ol style="list-style-type: none"> 1. Introduction to various track lines in this zone. 2. Functions and role of Shunting Porter, Loco operator & Ground Man. 3. Different rolling stocks and their movements. 4. Steps of heat withdrawal, Stripping 5. Steps of Ready Train placement. 6. Procedure for taking out of Wheel Heats and Ready Train placement. 7. Special attention during Ingot & Crop movements 8. Safety precautions
8.	video demo of rolling mills area movements processes	<p>Rolling Mills Area Movements</p> <ol style="list-style-type: none"> 1. Safety precautions on equipments, Points at Yards , 2. Introduction to various Yards. 3. Introduction to different Mills Track Lines & their functions. 4. Functions of different types of Wagons and their uses.
9.	Practice on rolling mill area movements process. (including different wagons, empty placement to mill loco operation etc.)	<p>Rolling Mills Area Movements</p> <ol style="list-style-type: none"> 5. Systematic approach to collection of Wagons and empty placement to Mills. 6. Loco Operation during weighment of Wagons. 7. Steps to follow during adjustment and final weighment. 8. Procedure of Rake formation and line up.
10.	video demo of operation on related processes viz., iron ore, coal tippler and	<p>Operation in Iron Ore, Coal Tippler and High Line Zone</p>

	high line zone.	<ol style="list-style-type: none"> 1. Awareness to Safety on equipments and rolling stocks in this zone. 2. Check up procedure before & after start up The locomotive. Check Locomotive <ol style="list-style-type: none"> a) Before b) After c) During operation d) Stopping locomotive. 3. Introduction to iron ore, coal tippler, high line Angadpur, MMBL, SGP and other yards layout. 4. Procedure of Dressing of load wagons to tipplers.
11.	Practice on different types of operation. (Involving iron ore, coal tippler and high line zone etc.)	<p>Operation in Iron Ore, Coal Tippler and High Line Zone</p> <ol style="list-style-type: none"> 5. Operational parameters in push back mode movement. 6. Following instructions and sequence of high line operation. 7. Operation procedure at Steel Exchange Yard movements. 8. Inspection and operation procedure at Slag Granulation Plant yards. 9. Movement restrictions at weigh bridges. 10. Safety precautions during point lever operation.
12.	<p>Video demo on mobile rail crane operating process.</p> <p>Knowledge of speed limit. Knowledge of safety sensor.</p>	<p>Mobile Rail Crane Operation</p> <ol style="list-style-type: none"> 1. Awareness to Safety on equipment. 2. Pre start Check up procedure without actual load condition. Operation of the Locomotive. 3. Starting Operation of the engine 4. Procedure of Post Start Checking without load. 5. Operational parameters with load condition.
13.	Revision & Internal Assessment	

7.1.3 EMPLOYABILITY SKILLS

GENERAL INFORMATION

- 1) **Name of the subject** : **EMPLOYABILITY SKILLS**
- 2) **Applicability** : **ATS- Mandatory for fresher only**
- 3) **Hours of Instruction** : **110 Hrs. (55 hrs. in each block)**
- 4) **Examination** : **The examination will be held at the end of two years Training by NCVT.**
- 5) **Instructor Qualification** :

i) MBA/BBA with two years experience or graduate in sociology/social welfare/Economics with two years experience and trained in Employability skill from DGET Institute.

And

Must have studied in English/Communication Skill and Basic Computer at 12th /diploma level

OR

ii) Existing Social Study Instructor duly trained in Employability Skill from DGET Institute.

7.1.3.1 SYLLABUS OF EMPLOYABILITY SKILLS

A. Block – I Basic Training

Topic No.	Topic	Duration (in hours)
	English Literacy	15
1	Pronunciation : Accentuation (mode of pronunciation) on simple words, Diction (use of word and speech)	
2	Functional Grammar Transformation of sentences, Voice change, Change of tense, Spellings.	
3	Reading Reading and understanding simple sentences about self, work and environment	
4	Writing Construction of simple sentences Writing simple English	
5	Speaking / Spoken English Speaking with preparation on self, on family, on friends/ classmates, on know, picture reading gain confidence through role-playing and discussions on current happening job description, asking about someone's job habitual actions. Cardinal (fundamental) numbers ordinal numbers. Taking messages, passing messages on and filling in message forms Greeting and introductions office hospitality, Resumes or curriculum vita essential parts, letters of application reference to previous communication.	
	I.T. Literacy	15
1	Basics of Computer Introduction, Computer and its applications, Hardware and peripherals, Switching on-Starting and shutting down of computer.	
2	Computer Operating System Basics of Operating System, WINDOWS, The user interface of Windows OS, Create, Copy, Move and delete Files and Folders, Use of External memory like pen drive, CD, DVD etc, Use of Common applications.	
3	Word processing and Worksheet Basic operating of Word Processing, Creating, opening and closing Documents, use of shortcuts, Creating and Editing of Text, Formatting the Text, Insertion & creation of Tables. Printing document. Basics of Excel worksheet, understanding basic commands, creating simple worksheets, understanding sample worksheets, use of simple formulas and functions, Printing of simple excel sheets	
4.	Computer Networking and INTERNET Basic of computer Networks (using real life examples), Definitions of Local Area Network (LAN), Wide Area Network (WAN), Internet, Concept of Internet (Network of Networks), Meaning of World Wide Web (WWW), Web Browser, Web Site, Web page	

	and Search Engines. Accessing the Internet using Web Browser, Downloading and Printing Web Pages, Opening an email account and use of email. Social media sites and its implication. Information Security and antivirus tools, Do's and Don'ts in Information Security, Awareness of IT - ACT, types of cyber crimes.	
	Communication Skill	25
1	Introduction to Communication Skills Communication and its importance Principles of Effective communication Types of communication - verbal, non verbal, written, email, talking on phone. Non verbal communication -characteristics, components-Para-language Body - language Barriers to communication and dealing with barriers. Handling nervousness/ discomfort. Case study/Exercise	
2	Listening Skills Listening-hearing and listening, effective listening, barriers to effective listening guidelines for effective listening. Triple- A Listening - Attitude, Attention & Adjustment. Active Listening Skills.	
3	Motivational Training Characteristics Essential to Achieving Success The Power of Positive Attitude Self awareness Importance of Commitment Ethics and Values Ways to Motivate Oneself Personal Goal setting and Employability Planning. Case study/Exercise	
4	Facing Interviews Manners, Etiquettes, Dress code for an interview Do's & Don'ts for an interview	
5	Behavioral Skills Organizational Behavior Problem Solving Confidence Building Attitude Decision making Case study/Exercise	
	Entrepreneurship skill	15
1	Concept of Entrepreneurship Entrepreneurship- Entrepreneurship - Enterprises:-Conceptual issue Entrepreneurship vs. Management, Entrepreneurial motivation. Performance & Record, Role & Function of entrepreneurs in relation to the enterprise & relation to the economy, Source of business ideas, Entrepreneurial opportunities, The process of setting up a business.	

2	Project Preparation & Marketing analysis Qualities of a good Entrepreneur, SWOT and Risk Analysis. Concept & application of Product Life Cycle (PLC), Sales & distribution Management. Different Between Small Scale & Large Scale Business, Market Survey, Method of marketing, Publicity and advertisement, Marketing Mix.	
3	Institutions Support Preparation of Project. Role of Various Schemes and Institutes for self-employment i.e. DIC, SIDA, SISI, NSIC, SIDO, Idea for financing/ non financing support agencies to familiarizes with the Policies /Programmes & procedure & the available scheme.	
4	Investment Procurement Project formation, Feasibility, Legal formalities i.e., Shop Act, Estimation & Costing, Investment procedure - Loan procurement - Banking Processes.	
	Productivity	10
1	Productivity Definition, Necessity, Meaning of GDP.	
2	Affecting Factors Skills, Working Aids, Automation, Environment, Motivation How improves or slows down.	
3	Comparison with developed countries Comparative productivity in developed countries (viz. Germany, Japan and Australia) in selected industries e.g. Manufacturing, Steel, Mining, Construction etc. Living standards of those countries, wages.	
4	Personal Finance Management Banking processes, Handling ATM, KYC registration, safe cash handling, Personal risk and Insurance.	
	Occupational Safety, Health & Environment Education	15
1	Safety & Health Introduction to Occupational Safety and Health importance of safety and health at workplace.	
2	Occupational Hazards Basic Hazards, Chemical Hazards, Vibro-acoustic Hazards, Mechanical Hazards, Electrical Hazards, Thermal Hazards. Occupational health, Occupational hygienic, Occupational Diseases/ Disorders & its prevention.	
3	Accident & safety Basic principles for protective equipment. Accident Prevention techniques - control of accidents and safety measures.	
4	First Aid Care of injured & Sick at the workplaces, First-Aid & Transportation of sick person	
5	Basic Provisions Idea of basic provision of safety, health, welfare under legislation of India.	
6	Ecosystem Introduction to Environment. Relationship between Society and Environment, Ecosystem and Factors causing imbalance.	
7	Pollution Pollution and pollutants including liquid, gaseous, solid and hazardous waste.	
8	Energy Conservation Conservation of Energy, re-use and recycle.	

9	Global warming Global warming, climate change and Ozone layer depletion.	
10	Ground Water Hydrological cycle, ground and surface water, Conservation and Harvesting of water	
11	Environment Right attitude towards environment, Maintenance of in -house environment	
	Labour Welfare Legislation	5
1	Welfare Acts Benefits guaranteed under various acts- Factories Act, Apprenticeship Act, Employees State Insurance Act (ESI), Payment Wages Act, Employees Provident Fund Act, The Workmen's compensation Act.	
	Quality Tools	10
1	Quality Consciousness : Meaning of quality, Quality Characteristic	
2	Quality Circles : Definition, Advantage of small group activity, objectives of quality Circle, Roles and function of Quality Circles in Organization, Operation of Quality circle. Approaches to starting Quality Circles, Steps for continuation Quality Circles.	
3	Quality Management System : Idea of ISO 9000 and BIS systems and its importance in maintaining qualities.	
4	House Keeping : Purpose of Housekeeping, Practice of good Housekeeping.	
5	Quality Tools Basic quality tools with a few examples	

7.2 PRACTICAL TRAINING (ON-JOB TRAINING)
(BLOCK – I)
DURATION: 12 MONTHS

GENERAL INFORMATION

- 1) **Name of the Trade** : **OPERATOR LOCOMOTIVE AND RAIL CRANES IN STEEL PLANT**
- 2) **Batch size** : a) Apprentice selection as per Apprenticeship guidelines.
b) Maximum 20 candidates in a group.
- 3) **Examination** : i) The internal assessment will be held on completion of each block
ii) NCVT exam will be conducted at the end of 2nd year.
- 4) **Instructor Qualification** :

i) Degree/Diploma in **Mechanical** Engg. from recognized university/Board with one/two year post qualification experience in the relevant field.

OR

ii) NTC/NAC in the trade of **Operator Locomotive and Rail Cranes in Steel Plant** with three year post qualification experience in the relevant field.

Preference will be given to a candidate with Craft Instructor Certificate (CIC)

- 5) **Infrastructure for On-Job Training** : - As per Annexure – II

7.2.1 BROAD SKILL COMPONENT TO BE COVERED DURING ON-JOB TRAINING

A. BLOCK – I

DURATION: 12 MONTHS

1. Introduction to Loco Operation and Traffic Layout: -

- Familiarisation with rail networks
- Use of Personal Protective Equipments, Housekeeping practice
- Practical tips on how to avoid derailments, Familiarisation with derailment prone areas
- Types of Locomotives, Operation of Locomotives, Pre-start & part start checks, Slips and Skid management, Adjustment of Brakes
- Precautions during Shunting and Coupling, Precautions during movements in Curvatures and Elevated areas
- Handling Emergency situations

2. Operation in Blast Furnace Hot Metal and Slag Zone: -

- How to take personal safety before and during Loco operation
- Operation of Lever Points, Couplings /De-Couplings.
- Use of PPEs
- Suitable clothes for Loco & Shunting operation
- Study and use various types of rolling stocks in this zone
- Study various parts of the same and application

3. Steps to follow

- Coupling and de-coupling with loco & wagon
- Blowing Sharp Horn
- Checking point lever & tongue rail function
- Taking clearance from concerned agency

4. Steps to follow

- Coupling and de-coupling with loco & wagon
- Blowing sharp horn
- Checking point lever & tongue rail function
- Taking clearance from concerned agency

5. Steps to follow

- Coupling and de-coupling with loco & wagon
- Blowing sharp horn

- Checking point lever & tongue rail function
 - Taking clearance from concerned agency
6. **SMS and Ingot Movement Zone:**
- Use of Safety Helmet, Shoes, Fitted Cloths etc.
 - Use of Hand gloves.
 - Inspection & Stair case / Walk way cleaning
 - Operation of Ready Train, Heat, Spl. Quality Heat, Crop and Ingot movement in different routes.
 - Special precautions during coupling and de-coupling Ingot carrier cars.
7. **Rolling Mills Area Movements : -**
- Checking of personal safety and equipment safety.
 - Operation of Point Lever. Loco at different lines.
 - Inspection of Track and Mill Bay before placement of wagons and drawing of loads from mills.
 - Actions during derailment of wagon.
 - Inspection of internal Wagon fitness
 - Checking of Coupling, Coupling pin, Yard illumination.
 - Housekeeping activities of equipment and Yards on regular basis.
 - Operation during conditions of Overload, Track Jamming etc.
 - Coupling and Decoupling of Loco and Wagon.
 - Actions and Precautions to be taken during Push Back inside.
8. **Operation in Iron Ore, Coal Tippler and High Line Zone: -**
- Checking of personal safety, equipment health, yard condition, illumination.
 - Movement with locomotive and pointing to get acquainted with different routes of control-II and high line.
 - Checking of track position and communication with shunting porter and ground man before placement of load wagons to the tipplers.
 - Actions during placement of wagons in push back mode at Slag Granulation Plant yards.
 - Inspection of internal wagon fitness before high line movement.
 - Checking of coupling, coupling pin, during empty wagon rake formation & make over.
 - Housekeeping activities of equipment and yards on regular basis. Operation during conditions of overload, track jam etc at Slag Granulation Plant yards
 - Speed Control

9. **Mobile Rail Crane Operation:**

- Checking of personal safety, equipment health, Yard condition, Illumination before Crane operation.
- Steps to Understand movement and work restrictions at special areas.
- Checking of track positions and communication with Shunting Porters and concerned Agencies during actual work.
- Checking of Slings, Jacking before any operation.
- Operation of Crane at different working condition and areas.
- Attention to safety sensors.

ASSESSMENT STANDARD

8.1 Assessment Guideline:

Appropriate arrangements should be made to ensure that there will be no artificial barriers to assessment. The nature of special needs should be taken into account while undertaking assessment. Due consideration to be given while assessing for team work, avoidance/reduction of scrape/wastage and disposal of scarp/wastage as per procedure, behavioral attitude and regularity in training.

The following marking pattern to be adopted while assessing:

a) Weightage in the range of 60-75% to be allotted during assessment under following performance level:

For this grade, the candidate with occasional guidance and showing due regard for safety procedures and practices, has produced work which demonstrates attainment of an acceptable standard of craftsmanship.

In this work there is evidence of:

- demonstration of good operational skills while executing the assigned job.
- different accuracy achieved while undertaking different skills demanded by the job.
- a fairly good level of neatness and consistency in handling controls.
- occasional support in completing the project/job.

b) Weightage in the range of above 75%- 90% to be allotted during assessment under following performance level:

For this grade, the candidate, with little guidance and showing due regard for safety procedures and practices, has produced work which demonstrates attainment of a reasonable standard of craftsmanship.

In this work there is evidence of:

- good skill levels in operation while executing the assigned job.
- the majority of the accuracy achieved while undertaking different skills demanded by the job.
- a good level of neatness and consistency in handling controls.
- little support in completing the job.

c) Weightage in the range of above 90% to be allotted during assessment under following performance level:

For performance in this grade, the candidate, with minimal or no support in organization and execution and with due regard for safety procedures and practices, has produced work which demonstrates attainment of a high standard of craftsmanship.

In this work there is evidence of:

- high skill levels in operation while executing the assigned job.
- accuracy while undertaking different work being substantially in line with those demanded by the job.
- a high level of neatness and consistency in the finish.
- minimal or no support in completing the project

8.2 FINAL ASSESSMENT- ALL INDIA TRADE TEST FOR APPRENTICE

SUBJECTS	Marks	Sessional Marks	Full Marks	Pass Marks	Duration of Exam.
Practical	300	100	400	240	08 hrs.
Trade Theory	100	20	120	48	3 hrs.
Workshop Cal. & Sc.	50	10	60	24	3 hrs.
Engineering Drawing	50	20	70	28	4 hrs.
Employability Skill	50	-	50	17	2 hrs.
Grand Total	550	150	700	-	

Note: - The candidate pass in each subject conducted under all India trade test.

8. FURTHER LEARNING PATHWAYS

Employment opportunities:

On successful completion of this course, the candidates may be gainfully employed in the following industries:

1. Manufacturing & Process industries like steel plant and other related industries etc.

TOOLS & EQUIPMENT FOR BASIC TRAINING

**INFRASTRUCTURE FOR PROFESSIONAL SKILL & PROFESSIONAL
KNOWLEDGE**

TRADE: OPERATOR LOCOMOTIVE AND RAIL CRANES IN STEEL PLANT

LIST OF TOOLS & EQUIPMENTS FOR 20 APPRENTICES

As per training need the tools & equipment may be procured.

**INFRASTRUCTURE FOR WORKSHOP CALCULATION & SCIENCE AND
ENGINEERING DRAWING**

TRADE: OPERATOR LOCOMOTIVE AND RAIL CRANES IN STEEL PLANT

LIST OF TOOLS & EQUIPMENTS FOR 20 APPRENTICES

1) **Space Norms** : 45 Sq. m.(For Engineering Drawing)

2) **Infrastructure:**

A : TRAINEES TOOL KIT:-

Sl. No.	Name of the items	Quantity (indicative)
1.	Draughtsman drawing instrument box	20 Nos.
2.	Set square celluloid 45 ⁰ (250 X 1.5 mm)	20 Nos.
3.	Set square celluloid 30 ⁰ -60 ⁰ (250 X 1.5 mm)	20 Nos.
4.	Mini drafter	20 Nos.
5.	Drawing board (700mm x500 mm) IS: 1444	20 Nos.

B : FURNITURE REQUIRED

Sl. No.	Name of the items	Quantity (indicative)
1	Drawing Board	20 Nos.
2	Models : Solid & cut section	as required
3	Drawing Table for trainees	as required
4	Stool for trainees	as required
5	Cupboard (big)	01
6	White Board (size: 8ft. x 4ft.)	01
7	Trainer's Table	01
8	Trainer's Chair	01

INFRASTRUCTURE FOR ON-JOB TRAINING

TRADE: OPERATOR LOCOMOTIVE AND RAIL CRANES IN STEEL PLANT

For Batch of 20 APPRENTICES

Actual training will depend on the existing facilities available in the establishments. However, the industry should ensure that the broad skills defined against On-Job Training part (*i.e. 12 months*) are imparted. In case of any short fall the concern industry may impart the training in cluster mode/ any other industry/ at ITI.

GUIDELINES FOR INSTRUCTORS AND PAPER SETTERS

1. Due care to be taken for proper & inclusive delivery among the batch. Some of the following some method of delivery may be adopted:

- A) LECTURE
- B) LESSON
- C) DEMONSTRATION
- D) PRACTICE
- E) GROUP DISCUSSION
- F) DISCUSSION WITH PEER GROUP
- G) PROJECT WORK
- H) INDUSTRIAL VISIT

2. Maximum utilization of latest form of training viz., audio visual aids, integration of IT, etc. may be adopted.

3. The total hours to be devoted against each topic may be decided with due diligence to safety & with prioritizing transfer of required skills.