NATIONAL OCCUPATIONAL STANDARD

RAILROAD CONSTRUCTION MAINTENANCE AND REPAIR UNIT OPERATOR LEVEL 5

REFERENCE CODE / 12UMS0278-5

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Occupation:	**RAILROAD CONSTRUCTION MAINTENANCE AND REPAIR UNIT OPERATOR**
Level:	**5**[1]
Reference Code:	**12UMS0278-5**
Prepared by:	**Turkish State Railways (TCDD) Development & TCDD Personnel Solidarity and Assistance Foundation**
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[1] Occupational Qualification Level is determined as Level 5 in the octal (8) level matrix..

TERMS, SYMBOLS AND ABBREVIATIONS

COUPLING MATERIAL: materials which secure a highly stabilized frame by coupling rail bars with each other and sleepers; facilitate power transmission between rails and sleepers; prevent rail deformation and displacement; damp the impacts on superstructure via elastic transformations,

BALLAST PROFILE: shape of ballast on railroad section, with predefined dimensions,

BALLAST LEVELLING: alignment of ballast on track,

BALLAST: sharp-edged and sharp-angled hard and rough stones crushed to approximately 20-63 mm size which spread out and transmit all impacts delivered from sleepers to platform by means of friction between fines without causing any permanent collapses,

BLOCK BRACKET: Superstructure material prepared in the form of blocks which function as bracket for rails,

AREA AND TIME PERMIT: a permit given by traffic controller for use of an area which is restricted due to maneuver, signalization failure or any other operation for a certain time period,

TAMPERING: Pressing the ballast which already exists on the track, beneath the sleepers in order to provide its functionality to be a suitable bearing for sleepers,

FRAME (PANEL): one-rail bar long section of the superstructure where rail sleeper and coupling materials are already installed,

CANT RAMP: special inclined section which provides passage from the track with cant to one without cant,

CANT: extra height given to outer rail compared to the inner one to reduce or remove the impact of centrifugal force on horizontal curves,

BACKFILL (EMBANKMENT): Building infrastructure which is obtained by filling and pressing places where black level is lower than red level, in order to create a platform on railway route,

DRAINAGE: sending waters on the railway route away,

VERTICAL AXIS: Railroad level on ground profile of the track,

VERTICAL CURVE: the curve which provides passage between lines with various inclinations crossing each other on ground profile of the track,

RAIL CLEARANCE: horizontal gap between inner sides of rail head between two laid rail bars of a rail line

DRILL: angular irregularity between sleeper's axis and railroad axis,

SIEVE: sieving unit of ballast sieving machine,

ELECTRIFICATION: a system including power transmission lines, substations and their direction and control units, to perform electrical operations on railroad transportation systems,

CROSS SECTION: a section which is assumed as starting from any point of railroad axis through a certain straight line vertical to the axis,

GAUGE: Safe distance between stationary units and railroad vehicles,

LEVEL CROSSING: the section where railroad and highway cross each other at the same level,

LEVEL CROSSING COATING: Coating applied on railroad in order to allow land vehicles cross the railroad safely,

ISCO: International Standard Classification of Occupations,

OHS: Occupational Health and Safety,

STATION: place where railroad and railway units are located to provide traffic-related services and passenger and load transportation services,

SIGNAL: all audio and visual warnings with preset meanings, which are used for safe and regular traffic management,

CALIBRATION: using a quantity by proportioning it according to one of the units adopted for such quantity,

FIRECRACKER: a signal placed on rails, which explodes to make a sound alarm for railroad vehicles in extraordinary cases,

PPE (Personal Protective Equipment): all equipments, instruments, tools and devices for workers to wear, put on or hold, which are designed to fit the purpose of protecting workers from one or more risks arising from the works done and affecting their health and safety,

LEVEL: height according to a fixed base point,

BRIDGE: structures built to go beyond rivers, highways, railroads or etc,

CURVE FOR CURVE PASSAGE: parabolic readjustment curve available on curve entries,

CURVE: a spring piece which combines two straight rail bars with different angles,

LATH: Narrow and thick wooden,

FURNISHED: superstructure material laid as being functional on the track,

CULVERT: hydraulic engineering structures which allow small streams either flowing continuosly or after precipitations, pass from one side of track to the other,

PIN: reference point used in measurements,

RAIL PAD: plastic material used under rails,

RAIL PROFILE MEASURING DEVICE: a device which is used for measuring changes occurred on rail profile,

RAIL: specially profiled track superstructure component which provides an uninterrupted and smooth surface for vehicle wheels to roll and transmits load coming from wheels to culvert units,

REGULATOR: a regulator which is a railroad machine built for clearing up ballast spread along the trackside and providing ballast geometry on track,

RISK: the possibility of a loss, injury and/or any other hazardous consequence to occur due to a danger,

DANGER: potential to cause loss or damage which can be already available at workplace or come outside and can affect workers or workplace,

TO LEVEL: to ensure the required balance position,

TRAFFIC SCHEDULE: train's logbook,

TRAFFIC CONTROLLER: traffic controller who use systems and communication devices installed to ensure train traffic safety and management, conduct all train moves at a certain line section as planned, make decisions on train choice in cases not planned, to take provisional measures if the track is blocked,

TRAFFIC MANAGEMENET CENTER: the place where systems required for conducting traffic are located, traffic – related operations are conducted and instructions are given,

SLEEPERS: cross beams laid as embedded into the ballast layer on vertical direction to track axis with certain clearances which function as culverts for rails,

TRAIN CREW: personnel who works on train,

TRAIN-SET: a set consists of rail-car(s) and wagons designed in accordance with them, as a combination of vehicles which cannot be unbundled,

TRAIN WAGON LIST: a document on which number, load, tonnage and destination station of wagons within a train-set are written,

TRAIN: a composite rail system vehicle consists of one or more traction cars and wagons,

UKR (LWR): Long welded rail,

WAGON (Towed vehicle): a rail system vehicle which has no self-driving power, can be moved by either towed or pushed via traction car, is eligible for transporting load or passenger on it,

CLEAVAGE: building infrastructure obtained by opening higher places through cleaving to create a platform on railway route,

HORIZONTAL AXIS: linear axis of railroad on ground profile of the track,

ENGINEERING STRUCTURES OF RAILROAD: usually structures providing water passages such as bridge and culvert,

RAILROAD UNITS: Units, which are integrated parts of engineering structures such as bridge, culvert; and railroad such as rail switch, level crossing and water channel.

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1. INTRODUCTION

National occupational standards on railroad construction, maintenance and repair unit operator (level 5) is issued by Foundation of Turkish Railways Development and Cooperation & Solidarity with Turkish Railways Personnel assigned by Vocational Qualifications Agency in accordance with provisions of "Directive on Drawing National Occupational Standards" and "Directive on Procedures and Fundamentals of establishment, assignment and works of Committees under Vocational Qualitifactions Agency" published pursuant to 5544 numbered Law on Vocational Qualifications Agency and mentioned law.

Railroad construction, maintenance and repair unit operator (level 5) is considered by asking opinions from relevant institutions and organizations in the sector and approved by Vocational Qualifications Agency Executive Board upon inpection by Transportation, Logistics and Communication Sector Committee under Vocational Qualifications Agency.

2. INTRODUCTION OF THE OCCUPATION

2.1. Definition of the Occupation

Railroad construction, maintenance and repair unit operator (level 5) is a qualified technical personnel who directs and administers teams established for the purpose of railroad construction, maintenance and repair works along the line sections to which he is assigned in accordance with the work schedule; makes any kind of technical measurements prior to application and/or has them done; enforce work schedule prepared as either daily or weekly in accordance with the instructions; makes reporting upon performance of required measurements after application, within the scope of OHS, environmental protection, quality rules and methodologies.

Railroad construction, maintenance and repair unit operator (level 5) is responsible for accuracy, quality, timing and compatibility with other works of the operation he performed during railroad construction, maintenance and repair activities to which he is assigned. He works in accordance with the operating instructions during operation. He is obliged to inform relevant persons about the malfunctions occurred outside his responsibility and his suggestions towards enchancement of work quality. He is not only responsible for ensuring his own work safety but also contributes to ensuring work safety of his team for whom he is responsible. He also contributes to ensuring other teams' work safety with whom he works.

2.2. Place of the Occupation in International Classification System

3123 (Civil Works Supervisors)

2.3. Regulations on Health, Safety and Environment

Labor Law No. 4857
Social Security and General Health Insurance Law No.5510
Occupational Health and Safety Law No. 6331
Bylaw on Control of Packaging and Packaging Wastes
Bylaw on the Control of Waste Oils
Regulation on the General Principles of Waste Management
By Law on the Principles and Procedures of Occupational Health and Safety Trainings of Employees

By Law on the Authorities, Tasks, and Responsibilities of Scientists Relating to Electricity
Bylaw on Heavy Current Electrical Installations
Bylaw on the Works of Carrying by Hand
By Law on the Environmental Noise
By Law on the Safety and Health Markings
By Law on Preparation, Completion and Cleaning Works
By Law on the Health and Safety Conditions when using Business Equipment
By Law on the Health and Safety Measures to be Taken in Business Place Buildings and Extensions
Bylaw on the Control of Solid Wastes
By Law on the Safety and Health Measures in the Works with Chemical Substances
By Law on the Usage of Personal Protective Equipment in the Business Places
Bylaw on Safety of Machinery (2006/42/EC)
By Law on the Protection of Employees from Dangers Caused by Explosive Environments

Regulation on Control of Hazardous Wastes Furthermore, it is essential to obey laws, statutory rules and regulations on occupational health and safety and environment; and to perform risk analysis regarding this issue.

2.4. Regulation on Control of Solid Wastes

Decree Law Concerning Regulation of State Economic Enterprises Personnel System Law No. 399 and Repealing Some Articles of Decree Law No. 233
Government Employee Unions and Collective Bargaining Law No. 4688
Law numbered 6356 on Trade Unions and Collective Bargaining Agreements
Law No. 657 on Public Servants
Bylaw on Traffic Signs

Other Legislation Regarding The Occupation Public Servants Law No. 657

2.5. Trade Unions Law No. 2821

There is an occupational disease risk for railroad construction, maintenance and repair unit operator (level 5), resulting from working environment and conditions. Since almost all of his duties are performed under outdoor field conditions, it is likely to be exposed to cold or hot weather conditions. It is an occupation which requires excessive care and sensitiveness in terms of compliance with occupational health and safety rules. Since the operations are related with train traffic, it can be said that he might work any hour of the day and even on holidays and working hours might exceed his routine working hours.

2.6. Other Requirements Regarding The Occupation

Railroad construction, maintenance and repair unit operator (level 5) must have health report and psycho-technical report indicating that his physical competence is fully meeting requirements of his assignment.

3. OCCUPATIONAL PROFILE

3.1. Duties, Tasks and Performance Criteria

Duties		Operations		Performance Criteria	
Code	**Title**	**Code**	**Title**	**Code**	**Description**
A	Observing ad complying with occupational health and safety, fire and emergency rules	**A.1**	To observe legal regulations and workplace rules on occupational health and safety	**A.1.1**	Gets information from OHS official regarding regulations and directives on OHS.
				A.1.2	Wears his overalls and uses PPEs supplied by employer, as suitable for the work done.
				A.1.3	Checks deficiencies (if any), compatibility and expiration date of his PPEs, and asks those concerned for replacement of those which are improper.
				A.1.4	Reports failures and deficiencies in first aid and emergency response equipments available at work site to those concerned.
				A.1.5	Places warning signs and boards regarding the operation done, in accordance with the instructions and thus contributes to ensuring safety of work place and other workers during the operations.
		A.2	To reduce risk factors	**A.2.1**	Contributes to risk determination studies.
				A.2.2	Considers the risks and dangers regarding his job within the scope of national regulations and standards and thus contributes to danger determination studies.
				A.2.3	Participates to studies carried out towards reducing risk factors.
		A.3	To apply emergency procedure in case of danger	**A.3.1**	Coordinates precaution studies to eliminate dangerous situations rapidly once detected.
				A.3.2	Reports dangerous situations which cannot be removed instantly to those concerned.
				A.3.3	Performs his duties as defined in emergency procedures.

Duties		Operations		Performance Criteria	
Code	**Title**	**Code**	**Title**	**Code**	**Description**
B	Fulfilling provisions of environmental protection regulations	**B.1**	To estimate environmental dangers	**B.1.1**	Contributes to evaluation of environmental impacts and potential dangers in connection with operations done
				B.1.2	Attends to periodic trainings for environmental protection requirements and practices
				B.1.3	Contributes to studies on elimination of given environmental danger sources and risk factors
		B.2	To ensure implementation of environmental precautions	**B.2.1**	Ensures that measures are taken in accordance with operating instructions in terms of possible environmental impacts during application of work process
				B.2.2	Ensures that waste materials produced during application of work process are discarded in accordance with operating instructions.
				B.2.3	Takes required actions for safe and best operation of devices, equipments and vehicles used, against their functions which might have negative effect on environment
C	Working in accordance with quality management system regulations	**C.1**	To keep quality of works performed under surveillance	**C.1.1**	Applies quality assurance rules and methods of the company in accordance with the instructions given in process forms
				C.1.2	Performs the works in accordance with the conditions defined in quality assurance rules and methods of devices and instruments used during work process
				C.1.3	Supervises the conformity of operations to standards
				C.1.4	Fills the quality management system forms regarding operations
		C.2	To participate to failure and fault prevention studies, which are detected in the process	**C.2.1**	Reports failures and faults detected during operations to his superior / relevant official
				C.2.2	Participates to inspections and assessments regarding detection of reasons caused fault and failures within the scope of his assigned duties.
				C.2.3	Reports his and his teams' observations, opinions and suggestion to improve work processes and to eliminate faults to the relevant official in accordance with operating rules and methods
				C.2.4	Applies rules and methods of the company regarding elimination of faults and failures, and/or make them applied
				C.2.5	Reports the faults and failures which are out of his authority or he is unable to eliminate, to relevant official

Duties		Operations		Performance Criteria	
Code	**Title**	**Code**	**Title**	**Code**	**Description**
D	Making work prepararions (to be continued)	**D.1**	To make personal preparations	**D.1.1**	Makes his self-care and cleaning
				D.1.2	Be present at workplace in time before commencement as defined in the regulations
				D.1.3	Makes required process for check documents regarding his status of attendance
				D.1.4	Wears overalls appropriate to the working rules of workplace and puts identification symbol and marks on his overalls and wears PPEs.
		D.2	To deliver the work	**D.2.1**	Takes work schedule
				D.2.2	Gets information from the person who delivers him an ongoing operation if it is an ongoing operation
				D.2.3	Negotiates the work plan with other workers in the team, for the works to be done as a team
		D.3	To get information about team	**D.3.1**	Checks team list
				D.3.2	Shares duties among team members according to their competencies
		D.4	To get information about machine hardware and materials	**D.4.1**	Supplies the lists including operating numbers of machines and names of operators
				D.4.2	Identifies lubrication and fuel requirements of machines and reports it to relevant person for replenishment
				D.4.3	Identifies spare parts requirements of machines and report it to relevant person for provision of them
				D.4.4	Prepare list of materials to be used, determines deficient materials
				D.4.5	Submits the lists to the relevant person for provision of materials

Duties		Operations		Performance Criteria	
Code	**Title**	**Code**	**Title**	**Code**	**Description**
D	Making work preparations (to be continued)	**D.5**	To get information about line section on which he will work	**D.5.1**	Takes forms including geometric, climatic, superstructure information regarding the relevant line section
				D.5.2	Identifies the start and finish kilometers of the operation
				D.5.3	Identifies the track on which operations shall be done in case of more than one tracks exist and measures the distance between other tracks
				D.5.4	Identifies status of traffic management system and electrification
				D.5.5	Identifies content of road infrastructure, climate information, landslide, erosion and flood potentials
				D.5.6	Identifies the range of operating temperatures
				D.5.7	Identifies kilometer, protection and covering information of level crossings
				D.5.8	Identifies construction techniques, length and gauge measures of bridges and tunnels
				D.5.9	Identifies length, height and distance to the road, of the load and passenger ramps
				D.5.10	Identifies backfills and cleavage.
				D.5.11	Identifies start and finish points, radius, length of entrance inclinations and applicable cants of the curves
				D.5.12	Identifies inclination, start and finis points, length and radius of passage curves on track
				D.5.13	Identifies vertical axis codes and horizontal axis distances
				D.5.14	Identifies sieving, tamping, welding operations previously done and length of rail bars
				D.5.15	Identifies type of rail, sleeper and coupling material

Duties		Operations		Performance Criteria	
Code	**Title**	**Code**	**Title**	**Code**	**Description**
D	Making work preparations	**D.6**	To check status of track materials laid on the relevant section	**D.6.1**	Makes visual inspection on rails, sleepers and coupling materials
				D.6.2	Marks materials which are broken, cracked, drilled, lapsed from axis and/or loosen
				D.6.3	Marks missing coupling material
				D.6.4	List his observations and report it to relevant persons
		D.**7**	To get information about train traffic	**D.7.1**	Takes train traffic forms
				D.7.2	Identifies trains' passage time, speed, number and tonnage

Duties		Operations		Performance Criteria	
Code	**Title**	**Code**	**Title**	**Code**	**Description**
E	Making transfer operations of railroad machines	**E.1**	To establish communication between machines	**E.1.1**	Ensures that there is radio on every machine
				E.1.2	Checks functionality of radios used on machines
				E.1.3	Ensures that radios used on machines are on the same channel
		E.2	To make traffic operation regarding machinery transport	**E.2.1**	Identifies machines' operation numbers and reports them to operators
				E.2.2	Reports place and time of operations to traffic control
				E.2.3	Asks traffic control for transport of machines
				E.2.4	Notifies transport order to operators
				E.2.5	Reports completion of operations to traffic control
		E.3	To issue forms about traffic	**E.3.1**	Supplies the order regarding work permit
				E.3.2	Receives traffic schedule, speed restrictions and forms including traffic warnings from traffic officer
				E.3.3	Gives copies of forms to operators
				E.3.4	Arranges traffic schedule

Duties		Operations		Performance Criteria	
Code	**Title**	**Code**	**Title**	**Code**	**Description**
F	Measuring railroad values (to be continued)	**F.1**	To make vertical axis measurements	**F.1.1**	Identifies the point at which measurement device shall be connected and then connects it to railroad
				F.1.2	Takes the measurement device to scale
				F.1.3	Identifies the place where measurement schedule shall be placed and has it placed
				F.1.4	Makes calibration of measurement device
				F.1.5	Reads level difference
				F.1.6	Extends lath from track to pin
				F.1.7	Takes lath to scale
				F.1.8	Measures the distance between track and lath
				F.1.9	Makes values written on track and makes a list of them
		F.2	To make horizontal axis measurements	**F.2.1**	Places measurement rope as to cut curve spring at two points
				F.2.2	Measures the distance between rope and curve spring with a meter
				F.2.3	Extends lath from track to lath
				F.2.4	Takes lath to scale
				F.2.5	Hangs plummet down from lath to pin
				F.2.6	Measures distance between footprint of plummet and track
				F.2.7	Makes values written on track and makes a list of them

Duties		Operations		Performance Criteria	
Code	**Title**	**Code**	**Title**	**Code**	**Description**
F	Measuring railroad values	**F.3**	To make measurements of level difference between two rail bars	**F.3.1**	Places measurement device on two rails
				F.3.2	Takes device to scale
				F.3.3	Measures level difference
				F.3.4	Makes values written on track and makes a list of them
		F.4	To make gauge measurements	**F.4.1**	Measures the distance between railhead and tunnel ceiling and side walls
				F.4.2	Extends lath over the platform to track
				F.4.3	Takes lath to scale
				F.4.4	Measures the distance between track and lath
				F.4.5	Measures the distance between rail head and platform
				F.4.6	Makes values written on track and makes a list of them
		F.5	To measure rail temperature	**F.5.1**	Places thermometer on rail casing
				F.5.2	Waits for measurement time
				F.5.3	Reads measured value
				F.5.4	Writes measurement time and value and makes list of values measured
		F.6	To measure rail profile	**F.6.1**	Sets rail profile measurement device according to measurement clearance appropriate for the rail to be measured
				F.6.2	Places rail profile measurement device on the rail
				F.6.3	Reads and lists values corresponding to measurement items

Duties		Operations		Performance Criteria	
Code	**Title**	**Code**	**Title**	**Code**	**Description**
G	Making railroad maintenance & repair (to be continued)	**G.1**	To block traffic on the rail line	**G.1.1**	Communicates with traffic controller and informs him about work schedule
				G.1.2	Reports start and finish points of track to be blocked
				G.1.3	Reports time of blockage
				G.1.4	Obtains permit to block line traffic and then block it
		G.2	To make preparations in order to restore railroad superstructures	**G.2.1**	Ensures that new rail bars are unloaded along the roadside regularly in an order
				G.2.2	Connects block brackets with rails and makes them ready for transport
				G.2.3	Prepares frame templates
				G.2.4	Ensures that rails and sleepers are connected, makes frames ready so makes them ready for transport
				G.2.5	Marks ones from new rails which have defects
				G.2.6	Makes materials to be removed lubricated
				G.2.7	Makes old materials are removed and piled
				G.2.8	Makes superstructure of rail line removed for urban lines
				G.2.9	Ensures that excavation materials are loaded and transported to dump site for urban lines
		G.3	To restore railroad superstructures (to be continued)	**G.3.1**	Makes old rails and sleepers taken during manual restorations and makes platform is arranged by construction equipments
				G.3.2	Ensures that block brackets are placed on vertical and horizontal axis and makes them coupled.

Duties		Operations		Performance Criteria	
Code	**Title**	**Code**	**Title**	**Code**	**Description**
G	Making railroad maintenance & repair (to be continued)	**G.3**	To restore railroad superstructures	**G.3.3**	Makes first layer ballast of the track laid
				G.3.4	Ensures that frames are placed on vertical and horizontal axis and makes them coupled.
				G.3.5	Ensures that machine takes adequate number of sleepers that can be enough for daily operation.
				G.3.6	Checks if machine's inter-wagon passage bridges are mounted completely and safely
				G.3.7	Ensures that the track is opened appropriately for entrance of the machine at the point from where machine shall take the road
				G.3.8	Monitors work progress when machine is operating
				G.3.9	Reports his determinations on issues which put work quality and safety at risk when machine is operating to those concerned.
				G.3.10	Warns personnel about OHS when machine is operating and sends personnel who endanger work safety away from working area.
				G.3.11	Ensures that the track is made appropriate for exit of the machine at the point from where machine shall derail.
				G.3.12	Ensures that old line and new line is connected safely at the section where machine is derailed.
				G.3.13	Ensures that steel mesh, reinforcements and moulds are built on the lines which are fixed to concrete
				G.3.14	Ensures that concrete is poured, jigged and vibrated on the lines which are fixed to concrete
				G.3.15	Ensures that sleepers are laid and rail bars are placed during manual restorations

Duties		Operations		Performance Criteria	
Code	**Title**	**Code**	**Title**	**Code**	**Description**
G	Making railroad maintenance & repair (to be continued)	**G.4**	To perform complementary activities for railroad superstructure restoration works	**G.4.1**	Makes sleeper clearances and drills regulated
				G.4.2	Makes under-rail pads mounted
				G.4.3	Makes railroad connecting materials pressed and checks them by means of torque meter.
				G.4.4	Makes over-spilling materials aligned.
				G.4.5	Detects damaged material during railroad restoration and ensures replacement of them
		G.5	To perform mechanical ballast sieving operation	**G.5.1**	Informs operator about kilometer information of level crossing, bridge, tunnel
				G.5.2	Makes sleepers de-united by discharging ballast at the point where machine will be placed on track
				G.5.3	Checks machine's sieving measurements
				G.5.4	Makes the machine placed on track
				G.5.5	Reports sieving measurements to operator.
				G.5.6	Determines the place on track where sieved ballast is laid
				G.5.7	Determines the place where waste materials will be discarded
				G.5.8	Makes exit ramp done
				G.5.9	Makes sleepers disunited for derailment of the machine
				G.5.10	Derail the machine
				G.5.11	Makes sleepers taken to their places which are disunited for exit
				G.5.12	Makes ballast filled

Duties		Operations		Performance Criteria	
Code	**Title**	**Code**	**Title**	**Code**	**Description**
G	Making railroad maintenance & repair (to be continued)	**G.6**	To perform mechanical tamping operation	**G.6.1**	Checks machine's calibration settings, pressing pressures, lifting and sliding values
				G.6.2	Checks machine diggers and ensures that deficient diggers are mounted
				G.6.3	Makes geometric information, measurement values uploaded to the machine
				G.6.4	Informs operator about kilometer information of level crossing, bridge, tunnel
				G.6.5	Checks digging depth and simultaneous strokes
		G.7	To make mechanical ballast arrangement	**G.7.1**	Informs operator about kilometer information of level crossing, bridge, tunnel
				G.7.2	Checks compatibility of machine's ballast regulating equipments and sweeping brushes with the railroad
				G.7.3	Makes signalization equipments removed which are within the operating area of machine
				G.7.4	Checks sleeper head and top ballast dimensions
				G.7.5	Checks distribution of regulated ballast on the railroad
		G.8	To make mechanical road stabilization operation	**G.8.1**	Informs operator about kilometer information of level crossing, bridge, tunnel
				G.8.2	Checks machine operating speed
				G.8.3	Checks the applicable frequency
				G.8.4	Checks the pressure to be applied by machine

Duties		Operations		Performance Criteria	
Code	**Title**	**Code**	**Title**	**Code**	**Description**
G	Performing railroad maintenance & repair	**G.9**	To make mechanical rail grinding / milling operation	**G.9.1**	Informs operator about kilometer information of level crossing, bridge, tunnel
				G.9.2	Makes rail profile measurements done before operating the machine
				G.9.3	Checks applicable grinding depth
				G.9.4	Checks rail profiles after the operation
				G.9.5	Takes required actions against fire risk during rail grinding
		G.10	To make rail switch replacement	**G.10.1**	Makes marking operation of the rail switch to be removed on its sleepers and rail bars
				G.10.2	Makes connection material of the rail switch to be removed demounted and rail bars and sleepers taken
				G.10.3	Ensures that materials removed are transported to storage area.
				G.10.4	Ensures that place of rail switch is regulated and first layer of ballast is laid
				G.10.5	Ensures that new rail switch is placed to its proper place in accordance with its project
				G.10.6	Makes rail switch ballast finished and ensures that mechanical repair is done
				G.10.7	Makes and lists measurements in accordance with rail switch project
		G.11	To open rail line traffic	**G.11.1**	Checks gauge
				G.11.2	Checks railroad measurement results
				G.11.3	Reports speed of trains on relevant section to traffic controller
				G.11.4	Opens the rail line traffic

Duties		Operations		Performance Criteria	
Code	**Title**	**Code**	**Title**	**Code**	**Description**
H	Operating work train (to be continued)	**H.1**	To transport ballast	**H.1.1**	Informs train personnel about work schedule
				H.1.2	Prepares the lists including number of wagons within the train set, their capacity and wagon numbers.
				H.1.3	Ensures that wagons are loaded according to their payload.
				H.1.4	Checks wagon gates' discharge levers
				H.1.5	Determines wagons which might hinder ballast laying operation and inform those concerned for elimination of such trouble.
				H.1.6	Arranges speed of train during ballast laying operation
				H.1.7	Ensures that ballast is laid on the track
				H.1.8	Checks gauges at the sections where ballast is laid down
				H.1.9	Lists location and quantity of ballast laid
		H.2	To transport sleepers, block brackets and frameworks (to be continued)	**H.2.1**	Informs train personnel about work schedule
				H.2.2	Prepares the lists including number of wagons within the train set, their capacity and wagon numbers.
				H.2.3	Makes wagon gates open
				H.2.4	Makes sleepers, block brackets and frames unloaded
				H.2.5	Checks gauges at the sections where sleepers are laid down

Duties		Operations		Performance Criteria	
Code	**Title**	**Code**	**Title**	**Code**	**Description**
H	Operating work train	**H.2**	To transport sleepers, block brackets and frames	**H.2.6**	Makes wooden wedge placed between sleepers
				H.2.7	Makes sleepers, block brackets and frames loaded on the wagons
				H.2.8	Makes wagon gates closed
				H.2.9	Ensures that piles are regular and at a height that cannot downfall
		H.3	To transport rail bars	**H.3.1**	Informs train personnel about work schedule
				H.3.2	Prepares the lists including number of wagons within the train set, their capacity and wagon numbers.
				H.3.3	Makes wagon gates open
				H.3.4	Makes rails unloaded
				H.3.5	Makes wooden wedge placed underneath the rails
				H.3.6	Makes rails loaded
				H.3.7	Makes rails coupled with each other
				H.3.8	Makes wagon gates closed

Duties		Operations		Performance Criteria	
Code	**Title**	**Code**	**Title**	**Code**	**Description**
I	Performing work – end delivery operations (to be continued)	**I.1**	To issue forms of personnel he is employed.	**I.1.1**	Writes name and identification of personnel on the forms
				I.1.2	Notes working time.
				I.1.3	Issues permit forms
				I.1.4	Signs the forms
		I.2	To report working records	**I.2.1**	Issues forms indicating kilometer/ working hour and quantity of work for the section where the works are performed
				I.2.2	Issues vertical and horizontal axes measurement forms
				I.2.3	Issues forms regarding measurement of level difference between two rail bars.
				I.2.4	Issues gauge measurement forms
				I.2.5	Issues rail temperature measurement forms
				I.2.6	Issues forms regarding transportation of rail sleeper ballast
				I.2.7	Delivers the forms to those concerned.
		I.3	To make work-end controls	**I.3.1**	Checks if there is incomplete work or not, in accordance with his work order
				I.3.2	Completes if there is incomplete work

Duties		Operations		Performance Criteria	
Code	**Title**	**Code**	**Title**	**Code**	**Description**
I	To do work – end delivery operations	**I.4**	To clean equipments and workplace at the end of work	**I.4.1**	Leaves his workplace in a tidy and clean condition.
				I.4.2	Makes maintenance of tools and instruments used at the end of work.
				I.4.3	Puts materials, tools and instruments used into their places.
				I.4.4	Takes maximum care during use of substances which may be hazardous in terms of occupational safety and stores them in predefined places properly.
		I.5	To report information about works done	**I.5.1**	Reports to his closest superior about works he did.
				I.5.2	Gives information about the work to personnel to whom he will deliver the work in case of ongoing works.
J	To carry out professional development activities	**J.1**	To perform training planning and organization studies	**J.1.1**	Meets training needs from relevant departments and use it.
				J.1.2	Utilizes periodic and one-time trainings in terms of time planning.
		J.2	To make studies on individual professional development	**J.2.1**	Performs research activities required for professional and personal development.
				J.2.2	Follows up new technologies and developments.
		J.3	To provide vocational training for his subordinates and other personnel	**J.3.1**	Transfers his knowledge and experiences to his workmates.
				J.3.2	Practices limited information and training in connection with the profession.

3.2. Tools, Appliances and Equipment Used

1. Agenda
2. Computer
3. Steel measuring tape
4. Super-elevation measuring device
5. Flash lamp
6. Communication tools (radio set, telephone, cell phone)
7. First Aid Kit
8. Sign flags
9. Sign board
10. Pen
11. Firecracker
12. Personal protective equipment
13. Lath
14. Rail profile measuring device
15. Rail thermometer
16. Feeler gage
17. Bubble level
18. Plumb
19. Chalk

3.3. Knowledge & Skills

1. Knowledge on emergency case
2. Analytical thinking skills
3. Basic first-aid knowledge
4. Knowledge and skills of computer and internet usage
5. Knowledge on railway traffic
6. Team management skills
7. General railway electrification and signaling knowledge
8. Knowledge on general occupational health & safety
9. Observation skills
10. Knowledge on the work site operation procedures
11. Decision making skills
12. Distance measuring skills
13. Knowledge of vocational terms
14. Skill of learning and being able to share what s/he learned
15. Ability to use optical devices for measurement
16. Planning, coordination, and orientation skills
17. Problem solving skills
18. Skills of oral and written communication
19. Skills of stress and crisis management
20. Knowledge on basic labour legislation

21. Knowledge on basic mathematics
22. Knowledge of basic mechanics
23. Knowledge on track
24. Knowledge on railroad construction, maintenance, and repair
25. Skill of using the time well.

3.4. Attitudes and Behaviors

1. To be cold blooded and calm under emergency and stressful situation
2. To inform superiors properly and in time
3. To decide within the scope of his knowledge and experience
4. Using her/his time effectively and efficiently in accordance with work orders
5. Adopting regulations set forth in environmental, quality, and OHS legislation
6. Sharing experience with associates
7. To be sensitive about the changes to occur during procedures
8. To be sensitive to use of operating assets and recycle
9. Behaving in accordance with hierarchical structure of workplace
10. Ensuring his/her own safety and safety of other people
11. Being enthusiastic about research for occupational development
12. To be planned and organized
13. To be sensitive to issues of risk and hazard factors
14. To know his/her responsibilities and to fulfill the same
15. Taking care of process quality
16. To inform the authorities in cases of danger
17. Taking care of cleanness, tidiness, and order of workplace
18. To share information effectively, openly and accurately in shift changes
19. To be open to change and to adapt to changing conditions
20. To inform concerned people about the defects which are not under his/her authority

4. TESTING, ASSESSMENT AND CERTIFICATION

Testing and assessment for certification with respect to national qualifications based on Railrad Construction Maintenance and Repair Unit Operator (Level 3) Occupational Standard shall be held in written and/or oral forms, theoretically and practically, in testing and assessment centers where required conditions are met.

Testing and assessment method and practice principles shall be detailed with national qualifications to be drawn up pursuant to this occupational standard. Activities regarding testing, assessment and certification shall be conducted within the framework of Vocational Qualification Authority, Testing and Certification Regulation.

ANNEX: Institutions participated in the Occupational Standard Preparation Process

1. Professional Standards Team of Institution Preparing Professional Standard

İsa APAYDIN	Deputy General Manager, TCDD
Murat ŞENEKEN	Education and Training Department Head, TCDD
Yavuz KIRAN	General Manager of TCDD Foundation
Mehmet EKTAŞ	Branch Manager (Education and Training Department, TCDD)
Feyzi SIVACI	Branch Manager (Education and Training Department, TCDD), moderator
Ekrem ARSLAN	Office Chief (Education and Training Department, TCDD)
Mustafa KÖROĞLU	Moderator (MoE İskitler Technical and Vocational High School Teacher)

2. Technical Work Group Members

Mustafa KORUCU	Vocational Group Coordinator (Vice Head of Railroad Department, TCDD)
Ali ÖZTÜRK	Vocational Group Coordinator (Vice Head of Railroad Department, TCDD)
Ercan KONAR	Railroad Maintenance and Repair Manager. TCDD
Mehmet ÖGEL	Railroad Surveyor, TCDD
Muzaffer TUNÇ	Railroad Surveyor, TCDD
Serdar ÇETİN	Railroad Surveyor, TCDD
Ömer GÜNER	Track Maintenance and Repair Clerk, TCDD
Ferhat DEMİRCİ	Track Maintenance and Repair Clerk, TCDD

3. People, Institutions, and Organizations Asked for Opinion:

Ministry of Labor and Social Security
MoE Occupational and Technical Education Directorate General
MoE Life-Time Learning Directorate General
MoE Innovation and Education Technologies Directorate General
Ministry of Science Industry and Technology
Ministry of Transportation maritime and Communication
Turkish Labor Institution (ISKUR)
Turkish Statistical Institute (TUIK)

Board of Higher Education (YOK)
State Personnel Administration
Small and Medium Industry Development Organization (KOSGEB)
Confederation of Revolutionary Trade Unions of Turkey (DISK)
HAK-IS Trade Union Confederation
Confederation of Turkish Tradesmen and Craftsmen (TESK)
Confederation of Turkish Trade Unions (TURK-IS)
Turkish Confederation of Employer Associations (TİSK)
Turkish Union of Chambers and Exchange Commodities (TOBB)
Turkish Exporters Assembly (TIM)
Ankara Chamber of Industry (ASO)
Ankara Chamber of Trade (ATO)
İstanbul Chamber of Commerce (İTO)
Aegean Region Chamber of Industry (EBSO)
İstanbul Ulaşım A.Ş.
Bursa Rail Operation Center (BURULAS)
Eskişehir Light Rail System Corporation (ESTRAM)
Ankara Subway
İzmir Metro A.Ş.

Antalya Metropolitan Municipality
Konya Metropolitan Municipality
The Turkish Employers Association of Construction Industries (INTES)
Yapıray
Rhomberg Kalebozan Railroad Cons. Ind. &Trade Inc.
Alarko Group of Companies
Yuksel Project Corporation
Olmuksa

Petkim
Tüpraş
Eti Mining Enterprise
Iskenderun Steel & Iron Plant Enterprise (ISDEMIR)
Eregli Steel & Iron Plant Enterprise (ERDEMIR) - MKE
Sumer Holding (Iron&Steel)
Yıldız Entegre (Tügsaş)
Demiryolu Lojistik Müh.San.Tic.Ltd.Şti.
Kayseray
Turkish Transportation Sector Public Workers Trade Union (TUS-Turk-Ulasim Sen)
Union of United Transport Workers (BTS) Bursa
Transportation Active Public Servants Trade Union Faal-Sen (UFS)
Union of Public Employees Related To Independent Transport Services, (BUS)
Transportation Workers Right Trade Union (Ulasim-Hak-Sen)
Transportation Workers Trade Union (Ulasim-Bir-Sen)
Transportation and Railway Workers Right Trade Union (Udem-Hak-Sen)
Association of Railway Vocational School Graduates
Association of Railway Machinists and Revisors
Association of Railroad Construction and Operation Personnel Solidarity and Assistance
Association of Railway Clerks
Association of Railway Train Professionals
Association of Railway Transportation
Association of Rail Transportation Systems
Turkish State Railways (TCDD) Railway Department
Turkish State Railways (TCDD) Traction Division
Turkish State Railways (TCDD) Premises Department

Turkish State Railways (TCDD) Personnel and Administrative Affairs Department
Turkish State Railways (TCDD) Traffic Department
Turkish State Railways (TCDD) Ankara Training Center
Turkish State Railways (TCDD) Eskisehir Training Center
Turkish State Railways (TCDD) Sivas Training Center
Turkish Locomotive and Motor Industry Corporation
Turkey Railway Machinery Industry Corporation
Turkish Railway Car Industry Corporation
Central Technical and Industrial Vocational High School
Anatolian Technical and Industrial Vocational High School
Ataturk Anatolian Industrial Vocational High School
Haydarpasa Anatolian Technical Vocational High School
Fatih Anatolian Vocational High School
Gazi Anatolian Vocational High School
Sht. Kemal Ozalper Anatolian Vocational High School
Anatolian University Porsuk Vocational School
Erzincan University Refahiye Vocational High School Rail Systems Program

4. Sector Committee Members and Experts

Prof. Dr. Mustafa KARAŞAHİN,	President (Board of Higher Education)
Şeyhamit Ünal SARIBAŞ,	Vice President (Ministry of Education)
Aykut KARAKAVAK,	Member (Ministry of Labor and Social Security)
Edip TÜRKAY,	Member (Ministry of Energy and Natural Resources)
Damla Ebru ESEN,	Member (Ministry of Industry and Trade)
Burak ERDEM,	Member (Turkish Confederation of Employer Associations)
Mehmet KARABÜBER,	Member (HAK Trade Unions Confederation)
Hakan BEZGİNLİ	Member (Turkish Union of Chambers and Exchange Commodities -TOBB)
Nizamettin ATEŞ,	Member (Confederation of Turkish Tradesmen and Craftsmen - TESK)
Dilek TORUN,	Member (Occupational Qualification Authority)

Firuzan SİLAHŞÖR,	Department Head (Occupational Qualification Authority)
Fatma GÖKMEN,	Sector Committee (Prime Ministry Department of the Administration of the Disabled and Elder Services)

5. Executive Board

Bayram AKBAŞ	Representative of Ministry of Labour and Social Security	President
Assistant Prof. Dr. Ömer AÇIKGÖZ	Representative of Ministry of National Education	Vice President
Prof. Dr. Mahmut ÖZER	Representative of Council of Higher Education	Member
Bendevi PALANDÖKEN	Representative of Professional Organizations	Member
Mustafa DEMİR	Representative of Turkish Confederation of Employer Associations	Member
Dr. Osman YILDIZ	Representative of Confederation of Turkish Trade Unions	Member