OCCUPATIONAL QUALIFICATION STANDARD

Cab Signalling Mechanic, EstQF Level 4

An occupational qualification standard is a document which describes the set of skills, knowledge and attitudes, i.e. competence requirements, needed to successfully accomplish duties. Occupational qualification standards are used for compiling curricula and awarding qualifications.

Occupational title	Level of Estonian Qualifications Framework (EstQF)
Cab Signalling Mechanic, EstQF Level 4	4

Part A
DESCRIPTION OF WORK

A.1 Description of work

Cab Signalling Mechanic, Level 4 conducts maintenance and repairs of safety equipment on board railway vehicles (ALS or automatic locomotive signalling) taking into account the technology of the work and economic, environmental protection, occupational health, occupational safety and ethical aspects.
They work independently in situations that are generally foreseeable but may vary.
Cab Signalling Mechanic, Level 4 works independently and in a team, their work requiring communication with co-workers and workers in other units.
They are responsible for the safety and quality of their work and the work they supervise, as well as for hazardous situations resulting from breaches of safety during maintenance (e.g. improper tools, techniques and methods).

There are five occupations in the field of maintenance and repairs of railway safety equipment.
Railway Signalling Area Assistant, Level 2 conducts uncomplicated maintenance and repairs on railway safety and communications equipment.
Railway Signalling Area Engineer, Level 4 conducts maintenance and repairs on railway safety and communications equipment.
Railway Signalling Area Engineer, Level 5 plans and organises maintenance and repairs of railway safety and communications equipment and carries out such work in their section.
Railway Signalling Area Engineer, Level 6 plans and organises maintenance and repairs of railway safety and communications equipment in several sections or throughout an organisation.
Cab Signalling Mechanic, Level 4 conducts maintenance and repairs of safety equipment on board railway vehicles.

A.2 Tasks

A.2.1 Inspection and diagnostics of railway vehicle safety equipment
1. Checking the reception of code signals in depot and field conditions
2. Verifying cab signal indications
3. Testing emergency brake operation
4. Checking the location geometry of inductive sensors
5. Checking the integrity of inductive sensors
6. Measuring the total resistance of inductive sensors and comparing the results with previous measurements
7. Conducting an electronic system alarm log review
8. Checking control device operation, comparing indications on electronic device PLC and locomotive touch screen IPC
9. Checking tractive force in the case of disabled safety equipment
10. Checking code current
11. Checking railway vehicle safety equipment main feed
12. Changing the operating parameters of railway vehicle safety equipment
13. Replacing defective components of railway vehicle safety equipment
14. Maintenance of technical equipment in the driver's cab of railway vehicles
15. Organising regular verification of measuring equipment

A.2.2 Analysing effectiveness and malfunctions of railway vehicle safety equipment 1. Analysing safety equipment effectiveness 2. Analysing safety equipment data 3. Analysing repeated malfunctions in safety equipment 4. Eliminating malfunctions in safety equipment A.2.3 Documenting work and managing railway vehicle safety equipment documentation 1. Documenting the work 2. Document management A.2.4 Supervision and resource management 1. Supervising an employee in training 2. Resource management
A.3 Work environment and specific nature of work
Cab Signalling Mechanic, Level 4 works both indoors and outdoors. The working hours are fixed, but in the event of major equipment breakdowns or brief technological windows they must work outside regular business hours, including on weekends and holidays. The workload may be unevenly distributed. The working environment is associated with an increased risk of injury and often requires working in a forced position. Exposure to chemicals and toxic agents, heat, humidity, low temperatures and temperature fluctuations can cause damage to health and therefore require the use of personal protective equipment. Due to the above-average level of dangerous work, a cab signalling mechanic must strictly observe the rules of work, health and safety. Breach of safety requirements can result in illness, trauma, disability or a rail traffic accident. The occupation of cab signalling mechanic requires regular medical check-ups.
A.4 Tools
The main tools are locksmith tools, hand tools (e.g. electric tools), indicator instruments, aids (e.g. shunt), precision measuring instruments (e.g. multimeter), communication devices (e.g. telephone and radio) and specialised tools (e.g. code simulator and computer equipped with specialised software).
A.5 Personal qualities required for work: abilities and characteristics
The work of a cab signalling mechanic requires cognitive abilities (fluency of thought, logical thinking, visual memory, spatial imagination and concentration) and mathematical abilities. In addition, stress tolerance, physical strength, accuracy of movement, speed, coordination, vigour, dexterity and odour sensitivity are required. Resilience, environmental tolerance, cooperative skills, learning ability, accountability, reliability, accuracy, self-discipline, communication readiness, decision-making skills and independence are also important in the work of Cab Signalling Mechanic, Level 4. Cab Signalling Mechanic, Level 4 is expected to commit to their work, accept the goals of their organisation and be prepared for change.
A.6 Professional preparation
Cab signalling mechanics are usually people who have general secondary education and who have acquired professional skills during practical work under the supervision of a cab signalling mechanic with at least Level 4 qualifications or a manufacturer of equipment.
A.7 Most common occupational titles
Cab Signalling Mechanic
A.8 Regulations governing profession
The work of a cab signalling mechanic is regulated by the Railways Act, the regulation of the Government of the Republic of Estonia 'List of Work Environment Hazards and Work for Which the Employment of Minors is Prohibited', the rules for the technical use of railways, railway signalling instructions, the internal normative documents of the organisation and the equipment manufacturer's instructions.

Part B
COMPETENCY REQUIREMENTS

B.1 Structure of occupation
Competences B.2.1-B.2.5 must be certified when applying for the qualification of Cab Signalling Mechanic, Level 4.

B.2 Competences

MANDATORY COMPETENCES

B.2.1 Inspection and diagnostics of railway vehicle safety equipment	EstQF Level 4
Performance indicators: 1. Checks code signal reception in depot and field conditions using a code simulator on a shunt and taking into account the manufacturer's instructions. 2. Verifies the correspondence of cab signal indications to a simulated code signal in accordance with the requirements of the ALS standard. 3. Tests emergency brake operation, taking into account the manufacturer's instructions. 4. Checks the location geometry of inductive sensors, taking into account the requirements of the ALS standard and the manufacturer's instructions. 5. Visually checks the integrity of inductive sensors and replaces defective sensors. 6. Measures the total resistance of two consecutive inductive sensors and compares the result with the measurements taken during previous maintenance, using diagnostic devices or special functions and taking into account the manufacturer's instructions. 7. Conducts an electronic system alarm log review, using diagnostic devices and taking into account the manufacturer's instructions. 8. Checks control device operation and compares indications on the electronic device PLC and the locomotive touch screen IPC, taking into account the requirements of the ALS standard. 9. Checks tractive force with safety equipment disabled, taking into account the requirements of the ALS standard. 10. Checks the value of code current, taking into account the requirements of the ALS standard. 11. Checks the main feed of safety equipment, taking into account the manufacturer's instructions. 12. Changes safety equipment operation parameters according to the procedures established by the railway infrastructure manager and the employer. 13. Replaces defective safety equipment components, taking into account the manufacturer's instructions. 14. Maintains other technical equipment in the driver's cab of railway vehicles (e.g. telephone and radio communication devices) in accordance with the internal normative documents and work arrangements of the organisation. 15. Organises the regular verification of measuring equipment in accordance with the internal normative documents of the organisation, regulations and the manufacturer's instructions.	
Knowledge: 1) principles of ALS architecture and its operation; 2) principles of the main functionality of the ALS coding system; 3) principles of ALS coding system architecture and its operation; 4) principles of ALS coding system external hardware architecture and its operation;	
B.2.2 Analysing effectiveness and malfunctions of railway vehicle safety equipment	**EstQF Level 4**
Performance indicators: 1. Analyses the effectiveness of safety equipment and proposes changes to operation parameters based on information from log files. 2. Analyses safety equipment data based on information from log files in accordance with the internal normative documents of the organisation and the manufacturer's instructions. 3. Analyses repeated malfunctions of safety equipment and takes steps to identify and eliminate the causes of malfunctions. 4. Independently eliminates malfunctions in safety equipment, taking into account the manufacturer's instructions.	

B.2.3 Documenting work and managing railway vehicle safety equipment documentation	EstQF Level 4
Performance indicators: 1. Documents the work and makes necessary record entries in accordance with the internal normative documents of the organisation and the manufacturer's instructions. 2. Manages documents in accordance with the stages of the document life cycle and the internal normative documents of the organisation.	
Knowledge: 1) principles of drafting documents; 2) requirements of document management.	
B.2.4 Supervision and resource management	**EstQF Level 4**
Performance indicators: 1. Supervises the employee in training and introduces technical documentation and the requirements of the internal normative documents of the organisation; observes supervised work and, if necessary, explains and corrects techniques by demonstrating and instructing the supervised employee to repeat the action until the correct result is achieved; analyses and evaluates the supervised employee's ability to fulfil their tasks and their attitude towards their work; advises the supervised employee in analysing errors that occur and in choosing remedial measures to be taken in accordance with the provided task, the selection of proper tools and techniques and the quality requirements specified. 2. Manages resources (e.g. monitors the availability of spare parts, consumables and tools and notifies the line manager of the need to replenish stocks) and monitors their cost-effective and targeted use in accordance with the internal normative documents of the organisation.	
Knowledge: 1) principles of communication psychology, including assertiveness; 2) basics of motivation; 3) basics of planning and organisation.	

RECURRING COMPETENCES

B.2.5 Recurring competences of Cab Signalling Mechanic, Level 4	EstQF Level 4
Performance indicators: 1. Ensures traffic safety through the functional continuity of the railway vehicle safety equipment maintained. 2. Informs their line manager of any malfunctions, deviations in railway vehicle safety equipment user activity and any issues that fall outside the limits of their competence. 3. Informs the infrastructure representative or the line manager of malfunctions in the operation of ALS external hardware. 4. Checks the proper functioning of the equipment after carrying out the work. 5. Pays heed to work instructions, technologies and quality requirements as well as the requirements of all relevant legislation (both national and international), including waste management regulations. 6. Works diligently and accurately without endangering human health, property or the environment; 7. Organises the workplace as required and selects appropriate tools in accordance with the nature of the work, ensuring they are in working order and safe before starting work; 8. Strictly observes occupational health and safety requirements when planning work, preparing the workplace, working and organising the workplace, and takes surrounding people and the environment into account in order to prevent occupational accidents; 9. Uses personal protective equipment (appropriate clothing and footwear, safety vest, etc.) and appropriate work methods and techniques that do not endanger life or health; 10. Identifies the risks (e.g. safety and deadlines) that may be associated with the achievement of goals and takes measures to mitigate them. 11. In the event of an occupational accident, performs first aid, calls for professional help and informs the emergency services and the employer of the accident; 12. In the event of a health, commercial, technical or environmental hazard, terminates the work and immediately informs their line manager.	

13. Uses all work equipment and tools prudently and properly, according to their operation instructions; 14. Regularly organises and cleans the tools, equipment and protective equipment used during work, following their maintenance instructions. 15. Is open to cooperation, takes part in teamwork, shares all necessary and useful information with others and works towards achieving the best result for all concerned; 16. Is capable of independently adapting to changes in working conditions and can find and analyse appropriate information to perform their duties and solve work-related problems. 17. Participates in professional discussions within the limits of their competence, presenting and defending their opinions in a well-argued way. 18. Participates in continuing vocational training, applies what they have learned in professional work; 19. Estonian language skills levels: understanding B2, speaking B1 and writing A2; Russian language skills levels: understanding B2 and speaking B1. 20. Uses a computer for information processing, communication, content creation and safety at the Independent user level on the Digital Competence Self-Assessment Scale (see Annex 2). 21. Organises support services required to operate safety equipment (e.g. software technical support and operational supply of materials).
Knowledge: 1) rules for the technical use of railways with annexes; 2) requirements of professional legislation and regulations, meanings of professional terms; 3) requirements of drafting technical documentation (e.g. technical maintenance instructions for devices) and documents; 4) requirements of operating on railways; 5) occupational safety requirements; 6) what to do in an emergency situation; 7) principles of waste management; 8) principles of operation and maintenance of computer equipment; 9) fire safety requirements; 10) environmental protection requirements. 11) what to do in the event of traffic and occupational accidents; 12) requirements of procedures for reporting incidents affecting railway safety; 13) types of communication used on railways; 14) principles of road safety for repair, maintenance and construction work; 15) requirements of ALS equipment.
Assessment methods: Recurring competences are assessed in an integrated manner as part of the assessment of the other competences listed in the occupational qualification standard.

Part C
GENERAL INFORMATION AND ANNEXES

C.1 Information concerning compilation and certification of occupational qualification standard and reference to classification of occupations	
1. ID of occupational qualification standard in register of occupational qualifications	12-15052019-1.1.6/2k
2. Occupational qualification standard compiled by:	Anto Looken, SA Raudteekutsed Anton Jartsev, AS EVR Cargo Indrek Süld, AS Eesti Raudtee Margus Kollo, AS EVR Cargo Mati Lõhmus, AS Eesti Raudtee Tarvi Viisalu, AS Eesti Raudtee Tiiu Poltruk, Edelaraudtee Infrastruktuuri AS
3. Occupational qualification standard approved by:	Transport and Logistics
4. No. of decision of Sectoral Council	12

5. Date of decision of Sectoral Council	15.05.2019
6. Occupational qualification standard valid until	10.04.2024
7. Occupational qualification standard version no.	2
8. Reference to International Standard Classification of Occupations (ISCO 08)	7412 Electrical Mechanics and Fitters
9. Reference to European Qualifications Framework (EQF)	4
C.2 Occupational title in foreign language	
English:	Cab Signalling Mechanic, EstQF Level 4
Finnish:	Rautatie mekaanikko
Russian:	Механик СЦБ железнодорожного транспорта
C.3 Annexes	
Lisa 1 Language skills level descriptions	
Lisa 2 Scale of self-assessment in digital competence	