NATIONAL COUNCIL FOR TECHNICAL AND VOCATIONAL EDUCATION AND TRAINING

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PROPOSED OCCUPATIONAL STANDARDS

OCCUPATION: LIFTING, LOADING AND UNLOADING MACHINERY OPERATION TECHNICIAN

LEVEL: NTA 4

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ABBREVIATIONS

NACTVET	National Council for Technical and Vocational Education and Training
NOS	National Occupational Standards
OS	Occupational Standards
TET	Technical Education and Training
TVET	Technical and Vocational Education and Training

GLOSSARY OF TERMS

Circumstantial Knowledge:	Detailed knowledge, which allows the decision-making in regard to different circumstances and cross cutting issues.
Competence:	The ability to use knowledge, understanding, practical, and thinking skills to perform effectively to the workplace standards required in employment.
Competency:	A description of the ability one possesses when able to perform a given occupational task effectively and efficiently.
Competency-based Education:	An instructional programme that derives its content from validated tasks and bases assessment on the learner's performance.
Curriculum:	A description or composite of statements about "what is to be learned" by the trainee/student in a particular instructional programme; a product that states the "intended learning outcomes".
Educational/Training Programme:	The complete curriculum and instruction (what and how) that is designed to prepare a person for employment in a job or other particular performance situation.
Occupation:	A specific position requiring the performance of specific tasks – essentially the same tasks are performed by all employees having the same title. (Example: baker)
Occupational Area:	This is a broad grouping of related jobs. (Example: food service)
Occupational Competence:	The application of knowledge and skills that consistently meet the standards required by the work context.
Occupational Standards:	Specific requirements of competences people are expected to demonstrate in a particular occupational area, including knowledge and relevant attitudes. They also act as a performance tool of assessment of the prescribed outcomes.
Occupational/Job Analysis:	A process used to identify the tasks that are important to employees in any given occupation**.**
Performance Criteria:	Indicate expected end results or outcomes in the form of evaluative statements.
Skills:	The ability to perform occupational tasks with a high degree of proficiency within a given occupation. Skill is conceived of as a composite of three completely interdependent components: cognitive, affective, and psychomotor.

Standards:	A set of statements, which if proved true under working conditions, means that an individual is meeting an expected level and type of performance.
Task Analysis:	The process of analysing each task to determine the steps, circumstantial knowledge, attitudes, performance standards, tools and materials needed, as well as safety concerns required for the employees performing it.
Task:	A work activity that has a definite beginning and ending, is observable or measurable, and consists of two or more definite steps that leads to a product, service, or decision.
Underpinning Knowledge:	Crucial knowledge that an individual must acquire in order to demonstrate competences that are associated in performing a given task.
Verification Process:	The process of having experts review and confirm the importance of the task (competency) statements identified through occupational analysis. Other questions, such as the degree of task learning difficulty are also frequently asked. This process is also sometimes referred to as validation.

1.0. INTRODUCTION

Technical Education and Training (TET) is one of the most important education sub-sectors in Tanzania, responsible for developing a skilled workforce to support the country's industrialization economic agenda. *Tanzania's Development Vision 2025* intends to raise the country's economy to a middle-income status. This requires a skilled workforce that is aligned with the needs of the public and private sectors of the economy. The National Council for Technical Education has begun the job of drafting Occupational Standards that will eventually be adopted as National Occupational Standards for TET in order to ensure that it meets the needs of the labour market and the country's economic agenda.

National Occupational Standards (NOS) are performance criteria that are matched with labour market demands. Each National Occupation Standard describes functions, performance standards, and knowledge/understanding for one important function or task. They combine skills, knowledge, and attitudes to describe best practice. They are useful tools for establishing job roles, personnel recruiting, supervision, and appraisal, as well as TET standards. They're also helpful for benchmarking and harmonizing qualifications on a national and international level. Standards, in general, provide a solid framework for high-quality TET that is labour market-relevant, current, and consistent in delivery across all public and private institutions.

However, it must be noted that, Occupational Standards and Training standards/qualifications standards are different. Occupational standards are defined in terms of activities performed by a person in a selected occupation (e.g., an electrical engineer designs electrical circuits, performs troubleshooting in electrical circuits, etc.) and they are usually defined by employers following procedures agreed upon by all stakeholders. Education and training standards are developed from the activities defined in occupational standards, and they include learning objectives to ensure that the necessary skills and knowledge are developed by a person to enable him or her to function at an agreed level in an occupation. Education and Training standards are used to define curricula in training institutions. It is however critical that there must be a direct link between the occupational standards and the training standards to respond to the demands of the labour market.

In TET delivery, Tanzania adopted the Competence Based Education and Training (CBET) approach. The CBET approach focuses on providing learners with the skills and knowledge required to meet the occupational standards. Occupational standards are thus the starting point for developing competency-based training (CBET) programmes. TET institutions will be required to benchmark their curricula with relevant occupational standards.

Occupational Standards are developed based on a given occupation's current and future demands. As a result, they serve as a means of bridging the gap between the worlds of employment and technical education and training (TET).

Lifting, Loading and Unloading Machinery Operation Technician has its own set of occupational standards. The document explains how the occupational standards were developed, as well as the scope, the occupational profile in the form of DACUM charts, and the Occupational Standards.

2.0. OCCUPATIONAL STANDARD DEVELOPMENT PROCESS

The Occupational standard development process began with an examination of major documents that guide Tanzanian skill development. The *10-year National Skills Development Strategy (2016-2026)* was one of the documents reviewed, and it outlined six (6) economic sectors that should be prioritized when developing skills development programmes.

These sectors include: Transport and Logistics, Tourism and Hospitality, Agribusiness, Construction, Energy and ICT. NACTE labour market reports were also used in the literature review to determine the skills demand in the Tanzanian labour market as a whole.

After the literature review, a workshop comprised of expert workers and educators with substantial knowledge and experience in the occupation conducted an occupational analysis utilizing the DACUM approach to produce the occupational profile. The analysis resulted in DACUM Charts, which are attached as Appendix 1 to this document.

The occupational standards were then developed. Experts in Occupational Analysis and the Development of Occupational Standards facilitated the workshop. Interviews, online surveys, and a stakeholder forum were used to validate the Occupational Standards. Engineers, Supervisory Technicians on the job, and experienced Lifting, Loading and Unloading Machinery Operation Technicians were key informants in the survey to discover occupational trends. This information was used to gain insight from the workplaces regarding trends and changes in the profession, including how well graduates are prepared for working in the occupation. A total of ... online surveys were completed by experts from the labour market across the country. Apart from the surveys aiding in defining the scope for the occupational analysis, they also served to engage a wide cross-section of experts in the occupation. Apart from this, the stakeholders' forum was attended by ... participants from different parts of the country representing various companies.

3.0. THE SCOPE AND OVERVIEW OF THE OCCUPATION STANDARDS FOR LIFTING, LOADING AND UNLOADING MACHINERY OPERATION TECHNICIANS

These standards cover a broad range of duties and tasks that can be performed by a Lifting, Loading and Unloading Machinery Operation Technician. However, the occupational standards are not meant to replace individual job descriptions. Instead, they are to be used for guidance in defining skill levels and knowledge for the technician in specific settings or positions. The Lifting, Loading and Unloading Machinery Operation Technician may perform tasks in a number of key areas of the Occupational Standards, but not necessarily in all areas. For example, in large operations, other individuals may be employed or designated to perform specific tasks.

The Lifting, Loading and Unloading Machinery Operation Technicians shall inspect, adjust and maintain lifting equipment under the supervision of the Lifting, Loading and Unloading Machinery Operation Engineers. They can complete the basic operation of lifting equipment, engage in the selection of equipment, lifting and moving tools and operating process, monitor equipment operating state during the operation and formulate protective measures for loading and unloading operations on site.

Generally, the Lifting, Loading and Unloading Machinery Operation Technician performs the following responsibilities:

a) Inspection of working environment

b) Daily spot inspection of equipment

c) Assistance in basic operations

d) Post-operation inspection

e) Assurance of working environment safety

f) Equipment system inspection

g) Basic operations

h) Equipment inspection and adjustment

i) Daily maintenance of equipment

j) Elimination of the safety hazards in the working environment

k) Equipment operation and debugging

l) Special and economical operations

m) Systematic inspection and adjustment

n) Equipment periodic maintenance

o) Judgment and exclusion of equipment faults

The Occupational Standards have been clustered into NTA qualification levels i.e. NTA level 4, 5 and 6.

4.0. VALIDITY PERIOD

Due to the rapid development of technology, the validity period of occupational standards is 3-5 years. The review will proceed in the same manner as the one before it, with new occupational standards being developed based on current trends of the labour market.

5.0. OCCUPATIONAL STANDARDS

5.1. OCCUPATIONAL STANDARDS FOR LIFTING, LOADING AND UNLOADING MACHINERY OPERATION TECHNICIAN - NTA 4

OCCUPATION	LIFTING, LOADING AND UNLOADING MACHINERY OPERATION TECHNICIAN	**OCCUPATION CODE**	
DUTY TITLE	INSPECTION OF WORKING ENVIRONMENT	**DUTY NO.**	401
TASK TITLE	IDENTIFICATION OF AND PROTECTION AGAINST HAZARD SOURCES	**TASK NO.**	4011
PERFORMANCE CRITERIA	The person performing this task must be able to identify and protect against hazard sources in accordance with the requirements of safety specifications for lifting operations and the manufacturer's equipment operation manuals.		
RANGE STATEMENT	The task can be performed at the lifting operation site under the supervision of senior lifting, loading and unloading machinery operation technicians. The tools and equipment to be used include: 1. Loading and unloading toolkits of lifting machinery; 2. Personal protective equipment, such as safety helmets, work clothes, work shoes, gloves and whistles; 3. Meteorological data receivers; 4. Level gauge; 5. Warning signs and fences; 6. Fire-fighting facilities such as fire extinguishers; 7. Signal generators.		

EVIDENCE REQUIREMENT	
PRACTICAL PERFORMANCE	**UNDERPINNING KNOWLEDGE**
The person performing this task must be able to do the following: 1. Wear labour protective equipment according to the specifications; 2. Identify hazardous factors in the lifting site; 3. Inspect whether the working condition of the safety devices for lifting operations is good and reliable; 4. Inspect the fire-fighting facilities of cranes; 5. Use fire-fighting equipment to extinguish fires; 6. Standardize the use of communication equipment for work communication.	**Detailed knowledge about:** **1.0 Methods** The person performing this task must be able to explain how to: 1.1 Identify hazardous factors on site; 1.2 Conduct safety inspection of fire-fighting facilities; 1.3 Conduct troubleshooting of the auxiliary equipment for safety; 1.4 Conduct troubleshooting of the auxiliary tools for safety; 1.5 Inspect personal protective devices. **2.0 Principles** The person performing this task must be able to explain the following principles: 2.1 Principles of identifying and protecting against hazard sources; 2.2 Principles of work safety for lifting operations; 2.3 Principles of using fire-fighting facilities;

	2.4 Principles of communication equipment. **3.0 Theories** The person performing this task must be able to explain the following: 3.1 Selection methods of inspection tools before lifting operations; 3.2 Safety identification of working conditions of lifting equipment; 3.3 Safety specifications for lifting operations. **4.0 Essential Skills** 4.1 Communication skills; 4.2 Customer service skills; 4.3 Teamwork skills; 4.4 Safety inspection skills.
DESCRIPTION OF THE END PRODUCT / SERVICE	Safety hazards of environment, equipment and operators are eliminated in accordance with the requirements of safety specifications for lifting operations.
CIRCUMSTANTIAL KNOWLEDGE	**Detailed knowledge about:** 1. Electronic and electrician technology; 2. Identification of hazard sources; 3. Knowledge of work safety and occupational health; 4. Knowledge of fire-fighting equipment usage; 5. Requirements of accident and hazard identification, governance and management.

OCCUPATION	LIFTING, LOADING AND UNLOADING MACHINERY OPERATION TECHNICIAN	**OCCUPATION CODE**	
DUTY TITLE	INSPECTION OF WORKING ENVIRONMENT	**DUTY NO.**	401
TASK TITLE	DETERMINATION OF THE SAFE WORKING RANGE OF PERSONNEL AND MACHINES ACCORDING TO THE WORKING ENVIRONMENT	**TASK NO.**	4012
PERFORMANCE CRITERIA	The person performing this task must be able to determine the safe working range of personnel and machines according to the working environment in accordance with the requirements of safety specifications for lifting operations and the manufacturer's equipment operation manuals.		
RANGE STATEMENT	The task can be performed at the lifting operation site under the supervision of senior lifting, loading and unloading machinery operation technicians. The tools and equipment to be used include: 1. Loading and unloading toolkits of lifting machinery; 2. Personal protective equipment, such as safety helmets, work clothes, work shoes, gloves and whistles; 3. Meteorological data receivers; 4. Level gauges; 5. Warning signs and fences; 6. Fire-fighting facilities such as fire extinguishers; 7. Signal generators.		

EVIDENCE REQUIREMENT	
PRACTICAL PERFORMANCE	**UNDERPINNING KNOWLEDGE**
The person performing this task must be able to do the following: 1. Wear labour protective equipment according to the specifications; 2. Determine the safe working range of personnel and machines according to the working environment; 3. Identify the actual lifting weight of cranes; 4. Determine the safe working range of equipment; 5. Inspect the operating condition of safety protection devices for lifting operations; 6. Inspect the using condition of the steel wire rope on the luffing mechanism for lifting operations, and determine whether it needs to be replaced.	**Detailed knowledge about:** **1.0 Methods** The person performing this task must be able to explain how to: 1.1 Troubleshoot circuit safety; 1.2 Troubleshoot safety distance; 1.3 Troubleshoot auxiliary equipment safety; 1.4 Troubleshoot other potential safety hazards; 1.5 Inspect personal protective devices. **2.0 Principles** The person performing this task must be able to explain the following principles: 2.1 Principles of identifying the safe working range of personnel and machines; 2.2 Principles of work safety for lifting operations; 2.3 Principles of safety specifications for lifting operations.

	3.0 Theories The person performing this task must be able to explain the following: 3.1 Methods of determining the safe working range of personnel and machines according to the working environment; 3.2 Proper wearing methods of personal protective equipment; 3.3 Methods of identifying the actual lifting weight of cranes; 3.4 Daily safety specifications for lifting operations; 3.5 Safety operation specifications of lifting machinery; 3.6 Operating conditions of lifting safety (protection) devices. **4.0 Essential Skills** 4.1 Communication skills; 4.2 Customer service skills; 4.3 Teamwork skills; 4.4 Safety inspection skills.
DESCRIPTION OF THE END PRODUCT / SERVICE	Safety hazards of environment, equipment and operators are eliminated in accordance with the requirements of safety specifications for lifting operations.
CIRCUMSTANTIAL KNOWLEDGE	**Detailed knowledge about:** 1. Common knowledge of fire safety; 2. Determination of the safe working range of personnel and machines according to the working environment in the lifting site.

OCCUPATION	LIFTING, LOADING AND UNLOADING MACHINERY OPERATION TECHNICIAN	**OCCUPATION CODE**	
DUTY TITLE	DAILY SPOT INSPECTION OF EQUIPMENT	**DUTY NO.**	402
TASK TITLE	SAFETY INSPECTION OF MECHANICAL COMPONENTS	**TASK NO.**	4021
PERFORMANCE CRITERIA	The person performing this task must be able to conduct the safety inspection of mechanical components in accordance with the requirements of safety specifications for lifting operations and the manufacturer's equipment operation manuals.		
RANGE STATEMENT	The task can be performed at the lifting operation site under the supervision of senior lifting, loading and unloading machinery operation technicians. The tools and equipment to be used include: 1. Loading and unloading toolkits of lifting machinery; 2. Personal protective equipment, such as safety helmets, work clothes, work shoes, gloves and whistles; 3. Meteorological data receivers; 4. Level gauges; 5. Warning signs and fences; 6. Fire-fighting facilities such as fire extinguishers; 7. Signal generators.		

EVIDENCE REQUIREMENT	
PRACTICAL PERFORMANCE	**UNDERPINNING KNOWLEDGE**
The person performing this task must be able to do the following: 1. Wear labour protective equipment according to the specifications; 2. Visually inspect whether there are cracks and deformation of the metal structure of the main parts of the equipment and tools; 3. Inspect whether the signal of the electrical equipment is normal; 4. Inspect whether the operation of each mechanism is normal.	**Detailed knowledge about:** **1.0 Methods** The person performing this task must be able to explain how to: 1.1 Troubleshoot circuit safety; 1.2 Inspect electrical equipment signals; 1.3 Troubleshoot equipment and component safety; 1.4 Troubleshoot other potential safety hazards; 1.5 Inspect personal protective devices; 1.6 Inspect the selection of tools. **2.0 Principles** The person performing this task must be able to explain the following principles: 2.1 Principles of lifting component detection; 2.2 Principles of work safety for lifting operations; 2.3 Principles of safety specifications for lifting operations; 2.4 Operation requirements and specifications of equipment; 2.5 Standard for the inspection of metal structures;

	2.6 Standards of tool selection and scrapping. **3.0 Theories** The person performing this task must be able to explain the following: 3.1 Methods of determining whether the metal structure of the main parts of the equipment and tools is normal; 3.2 Methods of determining the electrical equipment signals are normal; 3.3 Methods of determining the operation of each mechanism is normal; 3.4 Methods of determining the safe working range of equipment; 3.5 Safety operation specifications of lifting machinery; 3.6 Operating conditions of lifting safety (protection) devices; 3.7 Daily safety specifications for lifting operations. **4.0 Essential Skills** 4.1 Communication skills; 4.2 Customer service skills; 4.3 Teamwork skills; 4.4 Safety inspection skills.
DESCRIPTION OF THE END PRODUCT / SERVICE	Safety hazards of environment, equipment and operators are eliminated in accordance with the requirements of safety specifications for lifting operations.
CIRCUMSTANTIAL KNOWLEDGE	**Detailed knowledge about:** 1. Common knowledge of fire safety; 2. Underpinning knowledge of mechanical drawing and mechanical basis;

OCCUPATION	LIFTING, LOADING AND UNLOADING MACHINERY OPERATION TECHNICIAN	**OCCUPATION CODE**	
DUTY TITLE	DAILY SPOT INSPECTION OF EQUIPMENT	**DUTY NO.**	402
TASK TITLE	INSPECTION OF THE ADEQUACY OF FUEL, LUBRICATING OIL, HYDRAULIC OIL, COOLING WATER, ETC.	**TASK NO.**	4022
PERFORMANCE CRITERIA	The person performing this task must be able to inspect whether the fuel, lubricating oil, hydraulic oil, cooling water, etc. are adequate in accordance with the requirements of safety specifications for lifting operations and the manufacturer's equipment operation manuals.		
RANGE STATEMENT	The task can be performed at the lifting operation site under the supervision of senior lifting, loading and unloading machinery operation technicians. The tools and equipment to be used include: 1. Loading and unloading toolkits of lifting machinery; 2. Personal protective equipment, such as safety helmets, work clothes, work shoes, gloves and whistles; 3. Meteorological data receivers; 4. Level gauges; 5. Warning signs and fences; 6. Fire-fighting facilities such as fire extinguishers; 7. Signal generators.		

EVIDENCE REQUIREMENT	
PRACTICAL PERFORMANCE	**UNDERPINNING KNOWLEDGE**
The person performing this task must be able to do the following: 1. Wear labour protective equipment according to the specifications; 2. Inspect the lubrication of each lubricating part of the whole lifting equipment; 3. Inspect whether the oil level of the hydraulic system is normal and the pipeline is leaking; 4. Determine the safe working range of equipment.	**Detailed knowledge about:** **1.0 Methods** The person performing this task must be able to explain how to: 1.1 Troubleshoot circuit safety; 1.2 Inspect the lubrication of each lifting component; 1.3 Inspect for pipeline leakage. 1.4 Inspect the oil level of hydraulic systems; 1.5 Inspect personal protective devices; 1.6 Inspect the selection of tools. **2.0 Principles** The person performing this task must be able to explain the following principles: 2.1 Principles of lifting operation detection; 2.2 Safety specifications for lifting operations; 2.3 Lubrication standards of lifting operations; 2.4 Standards of pipeline leakage.

	3.0 Theories The person performing this task must be able to explain the following: 3.1 Technical performance and use requirements of cranes; 3.2 Basic knowledge of production and organisation; 3.3 Operating conditions of lifting safety (protection) devices. **4.0 Essential Skills** 4.1 Communication skills; 4.2 Customer service skills; 4.3 Teamwork skills; 4.4 Safety inspection skills.
DESCRIPTION OF THE END PRODUCT / SERVICE	Safety hazards of environment, equipment and operators are eliminated in accordance with the requirements of safety specifications for lifting operations.
CIRCUMSTANTIAL KNOWLEDGE	**Detailed knowledge about:** 1. Common knowledge of fire safety; 2. Knowledge of work safety and occupational health of lifting operations.

OCCUPATION	LIFTING, LOADING AND UNLOADING MACHINERY OPERATION TECHNICIAN	**OCCUPATION CODE**	
DUTY TITLE	DAILY SPOT INSPECTION OF EQUIPMENT	**DUTY NO.**	402
TASK TITLE	INSPECTION OF THE DISPLAY OF VARIOUS INDICATORS	**TASK NO.**	4023
PERFORMANCE CRITERIA	The person performing this task must be able to inspect the display of various indicators in accordance with the requirements of safety specifications for lifting operations and the manufacturer's equipment operation manuals.		
RANGE STATEMENT	The task can be performed at the lifting operation site under the supervision of senior lifting, loading and unloading machinery operation technicians. The tools and equipment to be used include: 1. Loading and unloading toolkits of lifting machinery; 2. Personal protective equipment, such as safety helmets, work clothes, work shoes, gloves and whistles; 3. Meteorological data receivers; 4. Level gauges; 5. Warning signs and fences; 6. Fire-fighting facilities such as fire extinguishers; 7. Signal generators.		

EVIDENCE REQUIREMENT	
PRACTICAL PERFORMANCE	**UNDERPINNING KNOWLEDGE**
The person performing this task must be able to do the following: 1. Wear labour protective equipment according to the specifications; 2. Select tools according to the cargo to be loaded and unloaded; 3. Inspect the display of various indicators.	**Detailed knowledge about:** **1.0 Methods** The person performing this task must be able to explain how to: 1.1 Troubleshoot circuit safety; 1.2 Inspect the display value of various indicators; 1.3 Inspect the selection of tools. **2.0 Principles** The person performing this task must be able to explain the following principles: 2.1 Principles of the detection and specific scope of lifting operations; 2.2 Principles of safety specifications for lifting operations; 2.3 Routine spot inspection and management regulations of equipment. **3.0 Theories** The person performing this task must be able to explain the following: 3.1 Methods of selecting cargo loading and unloading

	tools; 3.2 Methods of all kinds of indicator value judgment; 3.3 Operating conditions of lifting safety (protection) devices. **4.0 Essential Skills** 4.1 Communication skills; 4.2 Customer service skills; 4.3 Teamwork skills; 4.4 Safety inspection skills.
DESCRIPTION OF THE END PRODUCT / SERVICE	Safety hazards of environment, equipment and operators are eliminated in accordance with the requirements of safety specifications for lifting operations.
CIRCUMSTANTIAL KNOWLEDGE	**Detailed knowledge about:** 1. Common knowledge of fire safety; 2. Electronic and electrician technology; 3. Knowledge of work safety and occupational health of lifting operations.

OCCUPATION	LIFTING, LOADING AND UNLOADING MACHINERY OPERATION TECHNICIAN	**OCCUPATION CODE**	
DUTY TITLE	ASSISTANCE IN BASIC OPERATIONS	**DUTY NO.**	403
TASK TITLE	ASSISTANCE IN DETERMINING THE TRANSPORT ROUTE	**TASK NO.**	4031
PERFORMANCE CRITERIA	The person performing this task must be able to assist in determining the transport route in accordance with the requirements of safety specifications for lifting operations and the manufacturer's equipment operation manuals.		
RANGE STATEMENT	The task can be performed at the lifting operation site under the supervision of senior lifting, loading and unloading machinery operation technicians. The tools and equipment to be used include: 1. Loading and unloading toolkits of lifting machinery; 2. Personal protective equipment, such as safety helmets, work clothes, work shoes, gloves and whistles; 3. Meteorological data receivers; 4. Level gauges; 5. Warning signs and fences; 6. Fire-fighting facilities such as fire extinguishers; 7. Signal generators.		

EVIDENCE REQUIREMENT	
PRACTICAL PERFORMANCE	**UNDERPINNING KNOWLEDGE**
The person performing this task must be able to do the following: 1. Wear labour protective equipment according to the specifications; 2. Assist in determining the transport route according to the cargo to be loaded and unloaded.	**Detailed knowledge about:** **1.0 Methods** The person performing this task must be able to explain how to: 1.1 Determine the transport route; 1.2 Conduct safety inspection. **2.0 Principles** The person performing this task must be able to explain the following principles: 2.1 Safety specifications for working environment of lifting operations; 2.2 Safety specifications for lifting operations. **3.0 Theories** The person performing this task must be able to explain the following: 3.1 Safety judgment of the working environment and equipment of lifting operations; 3.2 Safety protection measures of cargo loading and unloading operations; 3.3 Methods of determining the transport route.

	4.0 Essential Skills 4.1 Communication skills; 4.2 Customer service skills; 4.3 Teamwork skills; 4.4 Safety inspection skills.
DESCRIPTION OF THE END PRODUCT / SERVICE	The determination of the transport route is assisted in accordance with the requirements of safety specifications for lifting operations.
CIRCUMSTANTIAL KNOWLEDGE	**Detailed knowledge about:** 1. Knowledge of work safety and occupational health; 2. Common knowledge of fire safety; 3. Basic operating methods and technical requirements of equipment.

OCCUPATION	LIFTING, LOADING AND UNLOADING MACHINERY OPERATION TECHNICIAN	**OCCUPATION CODE**	
DUTY TITLE	ASSISTANCE IN BASIC OPERATIONS	**DUTY NO.**	403
TASK TITLE	FLAG SETTING	**TASK NO.**	4032
PERFORMANCE CRITERIA	The person performing this task must be able to set flags in accordance with the requirements of safety specifications for lifting operations and the manufacturer's equipment operation manuals.		
RANGE STATEMENT	The task can be performed at the lifting operation site under the supervision of senior lifting, loading and unloading machinery operation technicians. The tools and equipment to be used include: 1. Loading and unloading toolkits of lifting machinery; 2. Personal protective equipment, such as safety helmets, work clothes, work shoes, gloves and whistles; 3. Meteorological data receivers; 4. Level gauges; 5. Warning signs and fences; 6. Fire-fighting facilities such as fire extinguishers; 7. Signal generators.		

EVIDENCE REQUIREMENT	
PRACTICAL PERFORMANCE	**UNDERPINNING KNOWLEDGE**
The person performing this task must be able to do the following: 1. Wear labour protective equipment according to the specifications; 2. Set flags according to the transport route.	**Detailed knowledge about:** **1.0 Methods** The person performing this task must be able to explain how to: 1.1 Set various kinds of flags; 1.2 Assist in the safety inspection. **2.0 Principles** The person performing this task must be able to explain the following principles: 2.1 Safety specifications for lifting operations; 2.2 Equipment operation manuals. **3.0 Theories** The person performing this task must be able to explain the following: 3.1 Safety specifications for lifting operations; 3.2 Flag setting requirements and methods. **4.0 Essential Skills** 4.1 Communication skills; 4.2 Customer service skills; 4.3 Teamwork skills;

	4.4 Safety inspection skills.
DESCRIPTION OF THE END PRODUCT / SERVICE	The flags of the tansport route are set in accordance with the requirements of safety specifications for lifting operations.
CIRCUMSTANTIAL KNOWLEDGE	**Detailed knowledge about:** 1. Knowledge of work safety and occupational health of lifting operations; 2. Common knowledge of fire safety; 3. Basic operating methods and technical requirements of the equipment.

OCCUPATION	LIFTING, LOADING AND UNLOADING MACHINERY OPERATION TECHNICIAN	**OCCUPATION CODE**	
DUTY TITLE	ASSISTANCE IN BASIC OPERATIONS	**DUTY NO.**	403
TASK TITLE	PASSING OF COMMAND SIGNALS	**TASK NO.**	4033
PERFORMANCE CRITERIA	The person performing this task must be able to pass command signals in accordance with the requirements of safety specifications for lifting operations and the manufacturer's equipment operation manuals.		
RANGE STATEMENT	The task can be performed at the lifting operation site under the supervision of senior lifting, loading and unloading machinery operation technicians. The tools and equipment to be used include: 1. Loading and unloading toolkits of lifting machinery; 2. Personal protective equipment, such as safety helmets, work clothes, work shoes, gloves and whistles; 3. Meteorological data receivers; 4. Level gauges; 5. Warning signs and fences; 6. Fire-fighting facilities such as fire extinguishers; 7. Signal generators.		

EVIDENCE REQUIREMENT

PRACTICAL PERFORMANCE	**UNDERPINNING KNOWLEDGE**
The person performing this task must be able to do the following: 1. Wear labour protective equipment according to the specifications; 2. Recognize gestures and signs for tansport.	**Detailed knowledge about:** **1.0 Methods** The person performing this task must be able to explain how to: 1.1 Use various flag setting methods. **2.0 Principles** The person performing this task must be able to explain the following principles: 2.1 Principles of setting flags. **3.0 Theories** The person performing this task must be able to explain the following: 3.1 Safety specifications for lifting operations; 3.2 Knowledge of command signals for equipment operation; 3.3 Basic operating methods and technical requirements of equipment; 3.4 Operation manuals of cranes. **4.0 Essential Skills** 4.1 Communication skills; 4.2 Customer service skills;

	4.3 Teamwork skills; 4.4 Safety inspection skills.
DESCRIPTION OF THE END PRODUCT / SERVICE	Command signals are identified, and the operations are conducted according to the signals in accordance with the requirements of safety specifications for lifting operations and equipment operation manuals.
CIRCUMSTANTIAL KNOWLEDGE	**Detailed knowledge about:** 1. Knowledge of work safety and occupational health of lifting operations; 2. Common knowledge of fire safety; 3. Basic operating methods and technical requirements of equipment.

OCCUPATION	LIFTING, LOADING AND UNLOADING MACHINERY OPERATION TECHNICIAN	**OCCUPATION CODE**	
DUTY TITLE	ASSISTANCE IN BASIC OPERATIONS	**DUTY NO.**	403
TASK TITLE	ASSISTANCE IN THE TRANSPORT WORK	**TASK NO.**	4034
PERFORMANCE CRITERIA	The person performing this task must be able to assist in the transport work in accordance with the requirements of safety specifications for lifting operations and the manufacturer's equipment operation manuals.		
RANGE STATEMENT	The task can be performed at the lifting operation site under the supervision of senior lifting, loading and unloading machinery operation technicians. The tools and equipment to be used include: 1. Loading and unloading toolkits of lifting machinery; 2. Personal protective equipment, such as safety helmets, work clothes, work shoes, gloves and whistles; 3. Meteorological data receivers; 4. Level gauges; 5. Warning signs and fences; 6. Fire-fighting facilities such as fire extinguishers; 7. Signal generators.		

EVIDENCE REQUIREMENT	
PRACTICAL PERFORMANCE	**UNDERPINNING KNOWLEDGE**
The person performing this task must be able to do the following: 1. Wear labour protective equipment according to the specifications; 2. Assist in the transport work in accordance with job requirements.	**Detailed knowledge about:** **1.0 Methods** The person performing this task must be able to explain how to: 1.1 Assist in the transport work. **2.0 Principles** The person performing this task must be able to explain the following principles: 2.1 Working principles of the mechanical, control and hydraulic systems of cranes; 2.2 Mechanical principles and electrical principles; 2.3 Equipment operating procedures. **3.0 Theories** The person performing this task must be able to explain the following: 3.1 Technical performance and use requirements of cranes; 3.2 Operating standards of lifting equipment; 3.3 Technical requirements of crane safety operations.

	4.0 Essential Skills 4.1 Communication skills; 4.2 Customer service skills; 4.3 Teamwork skills; 4.4 Safety inspection skills.
DESCRIPTION OF THE END PRODUCT / SERVICE	The transport work is assisted in accordance with the requirements of safety specifications for lifting operations and operating procedures.
CIRCUMSTANTIAL KNOWLEDGE	**Detailed knowledge about:** 1. Knowledge of work safety and occupational health of lifting operations; 2. Common knowledge of fire safety; 3. Basic operating methods and technical requirements of equipment.

OCCUPATION	LIFTING, LOADING AND UNLOADING MACHINERY OPERATION TECHNICIAN	**OCCUPATION CODE**	
DUTY TITLE	POST-OPERATION INSPECTION	**DUTY NO.**	404
TASK TITLE	FILLING IN OPERATION LOGS AND CONDUCTING SHIFT CHANGE	**TASK NO.**	4041
PERFORMANCE CRITERIA	The person performing this task must be able to fill in operation logs and conduct shift change in accordance with the requirements of safety specifications for lifting operations and the manufacturer's equipment operation manuals.		
RANGE STATEMENT	The task can be performed at the lifting operation site under the supervision of senior lifting, loading and unloading machinery operation technicians. The tools and equipment to be used include: 1. Loading and unloading toolkits of lifting machinery; 2. Personal protective equipment, such as safety helmets, work clothes, work shoes, gloves and whistles; 3. Meteorological data receivers; 4. Level gauges; 5. Warning signs and fences; 6. Fire-fighting facilities such as fire extinguishers; 7. Signal generators.		

EVIDENCE REQUIREMENT

PRACTICAL PERFORMANCE	**UNDERPINNING KNOWLEDGE**
The person performing this task must be able to do the following: 1. Wear labour protective equipment according to the specifications; 2. Change shift change in accordance with the procedures; 3. Fill in such records as job slips and operation logs.	**Detailed knowledge about:** **1.0 Methods** The person performing this task must be able to explain how to: 1.1 Standardize the filling of operation logs and conduct shift change. **2.0 Principles** The person performing this task must be able to explain the following principles: 2.1 Composition and working principles of each working mechanism of cranes. **3.0 Theories** The person performing this task must be able to explain the following: 3.1 Operational knowledge of lifting equipment; 3.2 Composition of cranes; 3.3 Requirements of filling in equipment operation logs; 3.4 Procedures and requirements of shift change. **4.0 Essential Skills**

	4.1 Communication skills; 4.2 Customer service skills; 4.3 Teamwork skills; 4.4 Safety inspection skills.
DESCRIPTION OF THE END PRODUCT / SERVICE	Post-operation inspection is carried out in accordance with the requirements of safety specifications for lifting operations.
CIRCUMSTANTIAL KNOWLEDGE	**Detailed knowledge about:** 1. Knowledge of work safety and occupational health of lifting operations; 2. Common knowledge of fire safety; 3. Basic operating methods and technical requirements of equipment.

OCCUPATION	LIFTING, LOADING AND UNLOADING MACHINERY OPERATION TECHNICIAN	**OCCUPATION CODE**	
DUTY TITLE	POST-OPERATION INSPECTION	**DUTY NO.**	404
TASK TITLE	SAFETY PROTECTION FOR OPERATIONS	**TASK NO.**	4042
PERFORMANCE CRITERIA	The person performing this task must be able to perform safety protection for operations in accordance with the requirements of safety specifications for lifting operations and the manufacturer's equipment operation manuals.		
RANGE STATEMENT	The task can be performed at the lifting operation site under the supervision of senior lifting, loading and unloading machinery operation technicians. The tools and equipment to be used include: 1. Loading and unloading toolkits of lifting machinery; 2. Personal protective equipment, such as safety helmets, work clothes, work shoes, gloves and whistles; 3. Meteorological data receivers; 4. Level gauges; 5. Warning signs and fences; 6. Fire-fighting facilities such as fire extinguishers; 7. Signal generators.		

EVIDENCE REQUIREMENT

PRACTICAL PERFORMANCE	**UNDERPINNING KNOWLEDGE**
The person performing this task must be able to do the following: 1. Wear labour protective equipment according to the specifications; 2. Inspect, test and reset safety protection devices.	**Detailed knowledge about:** **1.0 Methods** The person performing this task must be able to explain how to: 1.1 Perform safety protection for operations. **2.0 Principles** The person performing this task must be able to explain the following principles: 2.1 Composition and working principles of each working mechanism of cranes; 2.2 Work safety of lifting operations. **3.0 Theories** The person performing this task must be able to explain the following: 3.1 Operational knowledge of lifting equipment; 3.2 Knowledge of mechanical fault diagnosis; 3.3 Knowledge of mechanical maintenance. 4.0 Essential Skills 4.1 Communication skills; 4.2 Customer service skills;

	4.3 Teamwork skills; 4.4 Safety inspection skills.
DESCRIPTION OF THE END PRODUCT / SERVICE	Post-operation inspection is carried out in accordance with the requirements of safety specifications for lifting operations.
CIRCUMSTANTIAL KNOWLEDGE	**Detailed knowledge about:** 1. Knowledge of work safety and occupational health of lifting operations; 2. Common knowledge of fire safety; 3. Basic operating methods and technical requirements of equipment.

TABLE 1: DACUM CHARTS FOR LIFTING, LOADING AND UNLOADING MACHINERY OPERATION TECHNICIAN - NTA 4

DUTIES	TASKS	ENABLERS
1.0 Inspection of working environment	1.1 Identification of and protection against hazard sources. 1.2 Determination of the safe working range of personnel and machines according to the working environment.	**General skills and knowledge** · Knowledge of work safety and occupational health of lifting operations · Safety specifications for lifting operations · Communication skills · Customer service skills · Safety inspection skills **Tools and equipment** · Loading and unloading toolkits of lifting machinery · Personal protective equipment, such as safety helmets, work clothes, work shoes, gloves and whistles · Meteorological data receivers · Level gauges · Warning signs and fences · Fire-fighting facilities such as fire extinguishers · Signal generators · Whole set of toolboxes **Materials** · Measuring tools that comply with technical requirements **Requirements for employees** · Teamwork spirit, integrity, time management and commitment
2.0 Daily spot inspection of equipment	2.1 Safety inspection of mechanical components. 2.2 Inspection of the adequacy of fuel, lubricating oil, hydraulic oil, cooling water, etc. 2.3 Inspection of the display of various indicators.	**General skills and knowledge** · Knowledge of work safety and occupational health of lifting operations · Safety specifications for lifting operations · Communication skills · Customer service skills · Safety inspection skills · Routine spot inspection and management regulations of equipment

DUTIES	TASKS	ENABLERS
		· Inspection and management regulations of instruments and apparatus **Materials** · Measuring tools that comply with technical requirements · Lubricating oils that comply with technical requirements **Requirements for employees** · Teamwork spirit, integrity, time management and commitment
3.0 Assistance in basic operations	3.1 Assistance in determining the transport route. 3.2 Flag setting. 3.3 Passing of command signals. 3.4 Assist in the transport work.	**General skills and knowledge** · Knowledge of work safety and occupational health of lifting operations · Safety specifications for lifting operations · Communication skills · Customer service skills · Basic operating methods and technical requirements of equipment · Commanding signals for lifting and moving · Identification of on-site warning signs **Materials** · Loading and unloading toolkits of lifting machinery · Personal protective equipment, such as safety helmets, work clothes, · work shoes, gloves and whistles · Level gauges · Warning signs and fences · Signal generators · Whole set of toolboxes **Requirements for employees** · Teamwork spirit, integrity, time management and commitment
4.0 Post-operation	4.1 Filling in operation logs and conducting shift	**General skills and knowledge**

DUTIES	TASKS	ENABLERS
inspection	change. 4.2 Safety protection for operations.	· Knowledge of work safety and occupational health of lifting operations · Safety specifications for lifting operations · Fire safety in lifting operations · Operating conditions of safety devices in lifting operations · Safety protection measures of loading and unloading operations · Requirements of filling in equipment operation logs · Procedures and requirements of shift change **Materials** · Loading and unloading toolkits of lifting machinery · Personal protective equipment, such as safety helmets, work clothes, work shoes, gloves and whistles · Level gauges · Warning signs and fences · Signal generators · Whole set of toolboxes **Requirements for employees** · Teamwork spirit, integrity, time management and commitment