MINISTRY OF LABOR, INVALIDS AND SOCIAL AFFAIRS ---	THE SOCIALIST REPUBLIC OF VIETNAM Independence – Freedom - Happiness ---
No. 54/2016/TT-BLDTBXH	*Hanoi, December 28, 2016*

CIRCULAR

30 PROCEDURES FOR INSPECTION OF SAFETY OF MACHINERY, EQUIPMENT AND SUPPLIES TO WHICH STRICT OCCUPATION SAFETY REQUIREMENTS ARE APPLIED UNDER ADMINISTRATION OF MINISTRY OF LABOUR, INVALIDS AND SOCIAL AFFAIRS

Pursuant to the Law on Occupational Safety and Health dated June 25, 2016;

Pursuant to the Decree No.106/2012/ND-CP dated December 20, 2012 of the Prime Minister on functions, tasks, powers and organizational structure of the Ministry of Labour, Invalids and Social Affairs;

Pursuant to the Decree No.44/2016/ND-CP dated May 15, 2016 of the Government on some specific articles of the Law on Occupational Safety and Health on occupational safety inspection, provision of training in occupational safety and occupational hygiene, and working environment observation;

At the request of general director of Department of Occupational Safety;

The Minister of Labour, Invalids and Social Affairs promulgates the circular on 30 procedures for inspection of safety of machinery, equipment and supplies to which strict occupation safety requirements are applied under administration of Ministry of Labor, Invalids and Social Affairs.

Article 1. Scope and regulated entities

1. *30 procedures for inspection of safety of machinery, equipment and supplies to which strict occupation safety requirements are applied under administration of Ministry of Labor, Invalids and Social Affairs are attached to this Circular.* Names and symbols of the procedures are listed in the Appendix hereto attached.

2. This Circular shall be applied to organizations and individuals inspecting occupational safety of machinery, equipment and supplies to which strict occupation safety requirements are applied under administration of Ministry of Labor, Invalids and Social Affairs.

Article 2. Effect

1. This Circular shall come into force from June 1, 2017.

2. This Circular replaces the Circular No.07/2014/TT-BLDTBXH and Circular No. 46/2015/TT-BLĐTBXH.

Article 3. Implementation

1. The Department of Occupational Safety affiliated to the Ministry of Labor, War Invalids and Social Affairs organizations carrying out occupational safety inspection and relevant organizations and individuals are responsible for implementation of this Circular.

2. Any problem that arises during the implementation of this Circular should be reported to the Ministry of Labor, Invalids and Social Affairs./.

ON BEHALF OF MINISTER
DEPUTY MINISTER

Doan Mau Diep

PROCEDURES FOR INSPECTION OF SAFETY OF ROLLER COASTERS
QTKĐ: 27- 2016/BLĐTBXH

Preface

Procedures for inspection of safety of roller coasters are drafted by Department of Occupational Safety and promulgated together with the Circular No. 54/2016/TT-BLDTBXH dated December 28, 2016 of The Ministry of Labour, Invalids and Social Affairs.

PROCEDURES FOR INSPECTION OF SAFETY OF ROLLER COASTER

1. SCOPE AND REGULATED ENTITIES

1.1. Scope

Such procedures shall be used for first, periodic and unscheduled inspection of safety of roller coasters with a minimum elevation of 02 m and minimum speed of 03 m/s under administration of The Ministry of Labour, Invalids and Social Affairs.

1.2. Regulated entities

- Organizations carrying out occupational safety inspection;
- Occupational safety inspectors

2. REFERENCES

- TCVN 4244:2005, Lifting appliances – Design construction and survey;
- TCVN 9361:2012, Foundation works - Check and acceptance;
- TCXD 170:2007, Steel structures – Fabrication, assembly, check and acceptance – Technical requirements;
- QCXDVN 05:2008/BXD, Dwellings and Public Buildings - Occupational Health and Safety;
- TCVN 5638:1991, Evaluation of quality of building and installation activities – Basic principles.
- CAN/CSA - Z267-00, Safety codes for amusement rides and devices;
- TCVN 9358:2012 Installation of equipment earthing system for industrial projects - General requirements;
- TCXDVN 9385:2012: Protection of structures against lightning - Guide for design, inspection and maintenance;
- Standard GB 8408: 2008, Amusement device safety code

In the cases where national technical standards and regulations referred to in this document are amended or replaced, regulations of the latest documents shall apply.

Other standards may be applied to roller coaster safety inspection at the request of its manufacturer or owner if such standards contain the same or higher safety criteria than those in the national standards referred to in this document.

3. TERMS AND DEFINITIONS

In addition to terms in the above invoked and referenced documents, the following terms are used in description of this procedure:

3.1. Roller coaster:

An amusement ride in which a train use initial kinetic energy or potential energy to move on a rail system. The train is fixed on a rail for traveling only along the rail and without travelling in other directions.

3.2. Nominal load:

Nominal load is 90 kg, which is equivalent to a person

3.3 Dummy load:

A dummy load is an object with a suitable shape and size for loaded test, which has the weight of 100% or 110% of the nominal load.

3.4. Roller coaster for children;

Maximum height of a rider is 1375 mm.

3.5. Roller coaster for adults:

Minimum height of a rider is 1320 mm

3.6. First safety inspection:

First safety inspection is inspection of safety of the ride according to national technical standards and technical safety standards after its installation and before its first use.

3.7. Periodic safety inspection:

Periodic safety inspection is inspection of safety of the ride according to national technical standards and technical safety standards after expiration of the last safety inspection result.

3.8. Unscheduled safety inspection:

Unscheduled safety inspection is inspection of safety of the ride according to national technical standards and technical safety standards and will be carried out:

- after a repair or upgrade that affects the safety of the ride;
- after relocation of the ride; and
- at the request of the owner or a competent authority.

4. INSPECTION STEPS

Safety inspection shall be carried out in the following order:

- Inspection of the profile of the roller coaster;
- External inspection;
- Technical inspection – No-load test;
- Loaded test – Test methods;
- Inspection of rescue process in case of an accident;

- Processing inspection result.

Note: only take the next step if the previous step is passed. The result of each step shall be recorded according to the form in the Appendix 1 and retained by the inspecting organization.

5. INSPECTION EQUIPMENT

Inspection equipment shall be inspected and calibrated in accordance with regulations and law.

Inspection equipment includes:

- Altometer;
- Speedometer;
- Distance measuring equipment
- Geometric inspection equipment;
- Photometer;
- Force meter and hand scale;
- Insulation resistance meter;
- Ground resistance tester
- Multimeter
- Clamp meters;
- Nondestructive flaw detector (if necessary);
- Ultrasonic thickness meter (If necessary);
- Automatic level (if necessary)

6. CONDITIONS FOR INSPECTION

The inspection must not be carried out unless the following conditions are met:

6.1 The ride is ready for inspection.

6.2 Documents about the ride are adequate.

6.3 The inspection is not affected by weather.

6.4. Occupational safety and occupational hygiene operation of the ride are met.

7. PREPARATION FOR INSPECTION

7.1. Before carrying out the inspection, the inspecting organization and the owner shall reach an agreement on an inspection plan and prepare for the inspection and assign staff to participate in and witness the inspections.

7.2 Inspect the profile of the ride, which consists of the following documents;

The documents to be inspected vary according to the inspection. To be specific:

7.2.1 Regarding first inspection:

- The profile of a roller coaster, which consists of the following documents:

+ Certificates of the metals used for the ride and welding;
+ Calculation of strength of load-bearing parts;
+ Structural drawings which specify all main dimensions;
+ Guidelines for operation and maintenance.

- Release documents:

+ Certificates of the metals used for the ride and welding;

Welding joint inspection result;

+ Commissioning record;

+ As-built document;

- Reports on calibration of measurement equipment; record on inspection of insulation resistance and protective devices (if any).

- Documents on safety measurement results of equipment and relevant systems: earthing, lightning protection, electricity and other protective systems (drafted according to the manufacturer's documents or documents approved by competent authorities)

- Documents on foundation: Documents on foundation commissioning (the design approved by competent authorities, as-built drawings and other testing results, if any).

- Documents on installation: as-built drawings, commissioning record

- Certificate of conformity issued by authorized organizations in accordance with regulations and law.

Regarding periodic inspection:

- The previous profile, inspection record and inspection result;

- Documents on the use, operation and maintenance of the ride; inspection record (if any).

Regarding unscheduled inspection:

- In case of upgrade or repair: documents on design and renovation, repair and commissioning record.

- In case of relocation: installation documents.

- The inspection record issued by competent authority (if any).

The result is considered satisfactory if the documents are adequate and requirements specified in 7.2. are satisfied. If the inspection result is unsatisfactory, the owner shall take remedial actions.

7.3. Prepare suitable and adequate equipment for inspection.

7.4. Develop measures for ensuring safety and reach an agreement with the owner before inspection. Provide adequate personal protective equipment to ensure safety during the inspection.

8. INSPECTION PROCESS

An inspection shall be carried out in the following order:

External inspection:

8.1.1. Inspect the structure:

- Inspect the foundation, supports and their connection.

- Inspect the joints connecting the parts in the system by specialized tools.

- Use nondestructive testing methods (penetration testing, ultrasound, or radiography) to inspect important welding joints such as those of the rail, the support, main bearing structure.

8.1.2. Inspection of the propelling system:

- Maximum linear velocity at the cabin: 45km/h for roller coasters for adults and 16km/h for roller coasters for children.

- Inspect parameters of the propelling system with specialized equipment.

- Inspect insulation resistance of the engine at various voltage levels:

Nominal voltage	Testing voltage.	Insulation resistance
≤250	250	≥0.25
≤500	500	≥0.5
>500	1000	≥1.0

- Inspect the transmission parts of the propelling system, which generates necessary potential energy.

- Inspect the brake systems.

8.1.3. Inspection of cars:

- Inspection of labels in each car, maximum capacity and load.

- Structure of the cars.

- Wheels.

- Riders' seats.

- Inspect the restraints and seat belts.

- Inspection of the safety mechanism that prevent the axles from breaking, which may results in derailment.

- Inspect the main and spare connections between the cars.

8.1.4 Inspect the station and electrical systems, including:

- The handrails and signs.

- Inspect the roof.

- Inspect the control room

- Inspect the parking floor and access from parking lot to the cars

- Inspect the power supply layout

- Inspect the earthing system: ≤ 4.0 Ω

- Inspect the control circuits.

- Inspect the lighting equipment.

- Inspection of lightning protection system: ≤10 Ω.

- Inspect the compliance with applicable regulations on fire protection.

8.1.5. Inspect the safety systems:

- Inspect the safety lock in the cars.

- Inspect the seatbelts.

- Inspect the alarm system and signalling system.

The result is considered satisfactory if no damage or defect is found, all parts are working as designed and the requirements in section 8.1 are met.

No-load testing:

- Inspection of insulation resistance of the ride.

- No-load testing shall be run only when external inspection is done and the result is satisfactory.

- Run the ride 3 rounds without load, and then check its parameters and features.

The inspection result is satisfactory if the parameters are corrects, and all functions work as designed without signs of errors.

8.3 Overload testing:

- Test at 110% of normal load.

- Load norm of a car equals its testing load multiplied by capacity.

- Based on distribution of cars, load them to create random imbalance of the train in all 4 directions (front, rear, left, right). Each time imbalance is created, run the ride 3 rounds to evaluate its operation. Pay attention to the parts bearing heavier load.

The inspection result is considered satisfactory if the ride operates stably without signs of errors or damage affecting its safety and cars stop at to correct position.

Inspection of rescue function:

- Run the ride at 100% of at the positions that are most difficult for the rescue staff. Inspect the removal of the safety parts to take riders back to the station safely.

- Inspect the backup power generator and batteries that are used for removal of safety parts if they are available.

9. PROCESSING INSPECTION RESULTS

9.1 Prepare an inspection record which contains sufficient information according to the form in the Appendix 02 hereto attached.

9.3. Approve the inspection record:

Mandatory participants in the process of approving the inspection record:

- The representative or a person authorized by the ride owner;

- A witness;

- The inspector.

When the record is approved, the inspectors, the witness, and the representative or a person authorized by the ride owner shall append their signatures and seals (if any) on the record The record shall be made into 02 copies, one for each party.

9.3. Write the brief inspection result to the profile of the roller coaster (including full names of inspectors and the date of inspection).

9.4. Put on the inspection stamp: if the inspection result of a roller coaster is satisfactory, inspectors shall put an inspection stamp on it at a noticeable position.

9.5. Issuance of certificate of inspection results:

9.5.1. If the inspection result is satisfactory, the inspecting organization shall issue the certificate of inspection results to the roller coaster within 5 working days from the day on which the inspection record is approved.

9.5.2. If the inspection result is not satisfactory, only the steps in 9.1 and 9.2 shall be taken and the inspection record must specify the explanation for unsatisfactory result, necessary remedial actions and a deadline for taking such actions. The inspection shall be sent to the employment authority of the area where the roller coaster is located.

10. INSPECTION INTERVAL

10.1 A roller coaster has to be inspected every 3 years. Notice: The following inspection tasks shall be carried out on an annual basis: external inspection, no-load testing and rescue testing (according to Clause 1, 2 and 4 of Section 8 of this procedure).

10.2. In the case where a shorter interval is demanded by the manufacturer or owner, such interval shall apply.

10.3. If the inspection interval is shortened, the inspector shall provide explanation in the inspection record

10.4. If the inspection interval is specified in national technical regulations, such regulations shall apply.

APPENDIX 01

SPECIMEN OF THE ON-SITE RECORD
(ROLLER COASTER)

(Name of inspecting organization)

THE SOCIALIST REPUBLIC OF VIETNAM

……., ……

ON-SITE RECORD

No.: ……..

(written by the inspector)

1- General information

Name of the ride:…….

Name of the owner:.....

Address (head office of the owner):……

Address (location) of the ride:……

Content of the meeting with the owner:

- Representative: (information)
- Witnesses:

2- Basic parameters

- Code:.....
- Number of fabrication: .....
- Production year: .....
- Manufacturer: .....
- Number of cars: .....
- Maximum players/car:……..
- Maximum load:……kg
- Total track length: ..... m
- Maximum /minimum height: ..... m
- Diameter of helix:…….m

- Maximum speed:……. Km/h - Uses: ....

3- Document inspection:

- Machine profile:……

- Technical documents:

- Inspection of design and as-built document.

- Measurement results of earthing and lightning protection systems:…….

4- Code of measurement equipment:

5- Ride inspection:

a. External inspection:

+ Inspection of structure:

+ Inspection of the propelling system:

+ Inspection of cars:

+ Inspection of the station and electrical system:

+ Inspection of safety system:

b. Technical inspection:

+ Inspection of speed:

c. Testing at 110% load

+ Brake:

+ Metal structure:

+ Stop position of cabin:

d. Rescue testing:

6.- Inspection of the limit switch.

7. Processing and evaluation of inspection results.

8- Remedial actions: (if any)

WITNESS	**INSPECTOR**
(Signature and full name)	*(Signature and full name)*

APPENDIX 02

SPECIMEN OF THE SAFETY INSPECTION RECORD

(Name of inspecting organization)	**THE SOCIALIST REPUBLIC OF VIETNAM** **Independence-Freedom-Happiness**

……., ……..

SAFETY INSPECTION RECORD
(ROLLER COASTER)

No.:……..

(According to on-site record No:……)

We are:

1. ……..Inspector number:.....

2. …….. Inspector number……

Inspecting organization:……

Registration for certificate of the inspecting organization No:……

Name of the inspected ride:…….. ……

Name of the ride owner:……..

Address (head office of the owner):……..

Address (location) of the ride:……

Inspection procedures, applied standards: .....

Witness:……

1…….. Position:…….

2……. Position:…….

I-BASIC PARAMETERS OF EQUIPMENT

- Code:..... - Maximum players/ car:……..
- Number of fabrication:…… - Maximum load:…….kg
- Year of production:…….. - Total track length: ..... m
- Manufacturer:……. - Maximum / minimum height: ..... m
- Number of cars:…… - Diameter of helix: ..... m
- Maximum speed:……. Km/h - Uses:……..

II- FORMS OF INSPECTION

First time Periodic Unscheduled

Reasons for unscheduled inspection:……

III- INSPECTION CONTENT:

Document inspection:

No.	Inspection content	Satisfactory	Unsatisfactory	Note
1	Lift profile			
2	Practising certificate of the manufacturer	No:		

No.	Inspection content	Satisfactory	Unsatisfactory	Note
3	Document on foundation structure			
4	Documents on management and operation			

B. External inspection; no-load testing :

No.	Inspected parts	Satisfactory	Unsatisfactory	Note	No.	Inspected parts	Satisfactory	Unsatisfactory	Note
1	Foundation, supports and support connection				8	Electrical system			
2	Cars (Structures, wheels, restraints)				9	Lighting devices			
3	Guiding rail system				10	Lubrication system:			
4	Station (Structure, fence, signs)				11	Earthing and lightning prevention system			
5	Steel structure				12	Signalling system			
6	Electrodynamics system				13	Lubrication system			
7	Control system				14	Pneumatic brake system			

C- Load testing: parameters check:

No.	Inspected parts	Satisfactory	Unsatisfactory	Note	No.	Inspected parts	Satisfactory	Unsatisfactory	Note
1	Steel structure system				6	Brake system			
2	Velocity				7	Motor current			
3	Cars (Structures, wheels, restraints)				8	Connection between the cars			
4	Propelling system				9	Station brake system			
5	Control system				10	Rescue plan			

IV- CONCLUSIONS AND RECOMENDADTIONS

1. Result: Satisfactory □ Unsatisfactory □

Maximum load:…….. kg/person

2. Inspection stamp No:…… At:……

3. Necessary remedial actions:……

Deadline for taking remedial actions:……

V- INSPECTION INTERVAL

Date of next inspection :

Reasons for shortened interval (if any):

The record is approved on:

At:……

The record is made into of ……copies, each party holds…. copies./.

Owner	**Witness**	**Inspector**
	(Signature and full name)	***(Signature and full name)***

PROCEDURES FOR INSPECTION OF SAFETY OF ELECTRIC LIFT

QTKD: 21- 2016/BLDTBXH

Foreword

Procedures for inspection of safety of electric lift are drafted by the Department of Occupational Safety and promulgated together with the Circular No. 54/2016/TT-BLDTBXH dated December 28, 2016 of the Ministry of Labour, Invalids and Social Affairs.

PROCEDURES FOR INSPECTION OF SAFETY OF ELECTRIC LIFT

1. SCOPE AND REGULATED ENTITIES

1.1. Scope

Such procedures shall be used for first, periodic and unscheduled inspection of safety of electric lifts classified into those of Class I, II, III, IV under TCVN 7628 : 2007 (hereinafter referred to as “lift") and under administration of the Ministry of Labour, Invalids and Social Affairs.

Such procedures shall not apply to wheel lifting equipment, mining lifts, stage lifts, ship lifts, exploratory lifting platforms, onshore drilling rigs, construction lifts and other special types. Such procedures shall not apply to some special cases such as: explosive atmospheres, extreme weather, seismic hazard, carriage of dangerous objects, class V lift classified under TCVN 7628: 2007, equipment whose guide rails form an angle of more than 15 degrees relative to the perpendicular.

1.2. Regulated entities

- Organizations carrying out occupational safety inspection;

- Occupational safety inspectors.

2. 2. REFERENCES

- QCVN 02:2011/BLDTBXH, National technical regulation on safe work for electric lift;

- TCVN 6395:2008, Safety requirements for the construction and installation;

- TCVN 6904:2001, Electric lift - Test methods for the safety requirements of construction and installation;

- TCVN 7628:2007 (ISO 4190), Lift installation;

- TCVN 5867: 2009, Lifts, Cabins, counterweights and guide rails - Safety requirements

- TCVN 9358: 2012 Installation of equipment earthing system for industrial projects - General requirements;

- TCVN 9385:2012: Protection of structures against lightning - Guide for design, inspection and maintenance

In the cases where national technical standards and regulations referred to in this document are amended or replaced, regulations of the latest documents shall apply.

Other standards may be applied to electric lift safety inspection at the request of its manufacturer or owner if such standards contain the same or higher safety criteria than those in the national standards referred to in this document.

3. TERMS AND DEFINITIONS

In addition to terms in the above invoked and referenced documents, the following terms are used in description of this procedure:

3.1. “lift” is the lifting equipment that carries people to specific landing floors, has a cabin with suitable dimensions and system to carry people and objects and move along guide rails placed in vertical directions or forming an angle of 15 degree at maximum relative to the perpendicular.

3.2. “first safety inspection” is inspection of safety of the lift according to national technical standards and technical safety standards after its installation and before its first use.

3.3. “periodic safety inspection” is inspection of safety of the lift according to national technical standards and technical safety standards after expiration of the last safety inspection result.

3.4. “unscheduled safety inspection” is inspection of safety of the lift according to national technical standards and technical safety standards and will be carried out:

- after a repair or upgrade that affects the safety of the lift;
- at the request of the owner or a competent authority.

4. INSPECTION STEPS

Safety inspection shall be carried out in the following order:

- Inspection of the profile of the lift;
- External inspection;
- Technical inspection – No-load test;
- Loaded test – Test methods;
- Inspection result processing.

Note: Only take the next step if the previous step is passed. The result of each step shall be recorded according to the form in the Appendix 01 and retained by the inspecting organization.

5. INSPECTION EQUIPMENT

Inspection equipment shall be inspected and calibrated in accordance with regulations and law. Inspection equipment includes:

- Altometer (speedometer);
- Distance measuring equipment;
- Geometric inspection equipment;
- Thermometer;
- Photometer;
- Insulation resistance meter;
- Ground resistance tester;
- Multimeter;
- Clamp meters;
- Automatic level (if necessary).

6. CONDITIONS FOR INSPECTION

The inspection must not be carried out unless the following conditions are met:

6.1. The lift is ready for inspection.

6.2. Documents about the lift are adequate.

6.3. The inspection is not affected by weather.

6.4. Occupational safety and occupational hygiene operation of the lift are met.

7. PREPARATION FOR INSPECTION

7.1. Before carrying out the inspection, the inspecting organization and the owner shall reach an agreement on an inspection plan and prepare for the inspection and assign staff to participate in and witness the inspections.

7.2. Inspect the profile of the lift, which consists of the following documents.

The documents to be inspected vary according to the inspection. To be specific:

7.2.1 Regarding first inspection:

7.2.1.1. The profile of a lift, which consists of the following documents:

- General representation that displays product codes; production year; number of floors served, rated load and main technical specifications of the lifting system, e.g. controlling, safety equipment, pull machine, rope, durability.

- Layout of installation of component sets, cable and parts installation diagram.

- Plan for perspective view of an electric lift that shows its sizes, main parameters and cabin dimensions;

- Operating principle diagram;

- Instructions for operation and emergency response;

- Certificate of conformity issued by authorized organizations in accordance with regulations and law.

7.2.1.2. Documents on installation:

- As-built drawings and commissioning records;

- Results of ground resistance test and insulation resistance test (if any).

7.2.2 Regarding periodic inspection:

- The previous profile and inspection result;

- Documents on the use, operation and maintenance of the lift; inspection record (if any).

7.2.3 Regarding unscheduled inspection:

- Documents on design, renovation and repair;

- Commissioning record after renovation and repair;

- The inspection record issued by competent authority.

The result is considered satisfactory if the documents are adequate and requirements specified in 7.2.1, 7.2.2, 7.2.3 are satisfied. If the inspection result is unsatisfactory, the owner shall take remedial actions.

7.3. Prepare suitable and adequate equipment for inspection.

7.4. Develop measures for ensuring safety and reach an agreement with the owner before inspection. Provide adequate personal protective equipment to ensure safety during the inspection.

8. INSPECTION PROCESS

An inspection shall be carried out in the following order:

8.1. External inspection, which includes the following tasks:

8.1.1. Inspect the adequacy and uniformity of the lift: carry out an assessment according to Article 3.2 of TCVN 6904: 2001.

8.1.2. Inspect the accuracy of the manufacturer's documents and installation versus reality (regarding parameters, technical criteria and trademark).

8.1.3. Inspect defects and deformation of parts and machinery (if any).

8.1.4. Inspect the technical condition of parts and machinery.

The result is considered satisfactory if the lift is uniform and installed in accordance with the design, no damage, defect or error is found and requirements specified in 8.1 are satisfied.

8.2. Technical inspection – No-load test:

8.2.1. Inspect machine room and equipment in the machine room:

- Inspect the installation of equipment in the machine room: carry out an assessment according to Articles 5.1.1 and 5.1.2 of TCVN 6395:2008;

- Inspect the entrance of the machine room, levels of the handrails and stairs in the machine room: carry out an assessment according to Sections 5.1 and 5.2 of TCVN 6395: 2008;

- Inspect location of machinery, electrical enclosures, measurement of safe distance between them and building structures in the machine room: carry out an assessment according to Section 5.3.2 of TCVN 6395: 2008;

- Inspect insulation resistance: carry out according to Article 11.1.5 of TCVN 6395:2008;

- Inspect travelling cable - counterweight: diameter, wear, cable fixation, etc.: carry out an assessment according to 7.9.1 TCVN 6395:2008;

- Inspect the rope of the overspeed governor: carry out an assessment according to Section 9.3.6 of TCVN 6395-2008;

- Inspect the environment of the machine room: temperature, lighting, ventilation: carry out an assessment according to Sections 5.4.1, 5.4.2 and 5.4.3 of TCVN 6395:2008;

- Inspect electric brake: technical condition of brake drum, brake shoe, brake string and carry out an assessment according to Sections 10.3.3.1, 10.3.3.2, 10.3.3.4, 10.3.3.7 of TCVN 6395: 2008;

- Inspect pulleys, direction of rope and rope shielding: carry out an assessment according to clauses 7.9.6.1 and 7.9.6.2 of TCVN 6395: 2008;

- Inspect the arrangement of distribution boards and switches in the machine room: carry out an assessment according to Sections 11.4.1, 11.4.2 and 11.4.3 of TCVN 6395:2008;

- Inspect the electrical wiring installation from the main distribution boards to the electrical enclosures, from electrical enclosures to components of machines: carry out an assessment according to Sections from 11.5.1 to 11.5.12 of TCVN 6395:2008.

8.2.2. Inspect cabin and equipment in cabin

- Inspect the gap between the two cabin doors, gap between the door and the cabin frame: carry out an assessment according to Article 7.5.4 of TCVN 6395:2008.

- Regarding the hinged doors: Inspect and assess according to Article 7.5.5 of TCVN 6395-2008;

- Inspect technical condition and operation of toe guard: carry out an assessment according to Article 7.5.10.2.3 of TCVN 6395-2008;

- Inspect electrical equipment safety, control the opening and closing operation of cabin door: carry out an assessment according to Article 7.5.11.1 of TCVN 6395-2008;

- Inspect the ventilation and lighting system in the cabin: carry out an assessment according to Article 7.7 of TCVN 6395-2008;

- Inspect horizontal safe distance between the cabin door sill and floor sill, which shall not exceed 35 mm.

8.2.3. Inspect cabin roof and relevant equipment

- Inspect the space of the top of headroom: carry out an assessment according to Article 4.6.1 of TCVN 6395:2008.

- Inspect the cable fixed points at the cabin and counterweight.

- Inspect the trapdoor on the cabin roof and condition of electrical safety contact, control the opening and closing operation of trapdoor: carry out an assessment according to Sections 7.6.1 and 7.6.3 of TCVN 6395:2008.

- Inspect the balustrade on the cabin roof: carry out an assessment according to Section 7.3.5.3 of TCVN 6395:2008;

- Inspect the counterweight frame, installation of counterweight plates in the frame and fixation of plates in the frame.

- Inspect the cabin guide rails and counterweight: carry out an assessment according to Section 7.10.2 of TCVN 6395:2008.

- Inspect the safe distance between the cabin and counterweight, including the overhanging part of the two components, which shall not be less than 0.05 mm.

8.2.4. Inspect well.

- Inspect other equipment installed in the well: carry out an assessment according to Article 4.1.3 of TCVN 6395:2008.

- Inspect the well cover: carry out an assessment according to Article 4.2.1 of TCVN 6395:2008.

- Inspect the rescue doors and inspection doors: carry out an assessment according to Article 4.2.2 of TCVN 6395:2008.

- Well ventilation: the section of a ventilation hole shall not be less than 1% of the cross-sectional area of the well.

- Inspect installation and operation of the upper travel control equipment.

8.2.5. Inspect landing doors.

- Inspect the gap between the two wings, between the wing and frame: it shall not exceed 10 mm.

- Inspect the equipment for control the opening and closing operation of landing doors: inspect technical condition, mechanical interlocks and electrical contacts.

8.2.6. Inspect pit.

- Inspect the pit environment: pit bottom cleaning, waterproofing and lighting.

- Inspect technical condition, location of main distribution board in the pit bottom, including switches and sockets.

- Inspect installation and operation of the lower travel control equipment.

- Inspect the pit depth and vertical distance between the pit bottom and the lowest part of cabin bottom: carry out an assessment according to Section 4.6.3.5 of TCVN 6395: 2008.

- Inspect buffer: Inspect electrical contact of position control system (in case of energy absorber) and inspect the compression stroke of the buffer (Appendix L-TCVN 6395:2008).

- Inspect pulley, counterweight overspeed governor rope:

+ Condition of articulation of counterweight balanced beam;

+ Protection of pulley;

+ Slack-rope device.

8.2.7. No-load testing:

Let the lift operate and let cabin go through 3 full up-down cycles, and then supervise the operation of components.

The result is considered satisfactory if the equipment works as designed without signs of errors.

8.3. Loaded test – Test methods:

8.3.1. In-motion loading test wherein the lift carries 100% of rated load:

Load the cabin floor evenly, let the lift operate at rated speed and then check the following parameters:

- Motor current of the lift: assess and compare it with the profile of the lift;

- Cabin velocity: assess according to Section 10.7.1 of TCVN 6395:2008;

- Cabin safety gear (applied to instantaneous safety gear and instantaneous safety gear with buffered effect): tested at the testing speed, test methods and assessment carried out under Section 4.2.3.1.2 of TCVN 6904: 2001;

The result is considered satisfactory if the lift operates as designed and requirements set forth in Section 8.3.1 are satisfied.

8.3.2. In-motion loading test wherein the lift carries 125% of rated load:

Load the cabin floor evenly at 125% of rated load at the top stop position, let the lift travel down and then check:

- Electromagnetic brake: test methods and assessment carried out under Article 4.2.1- of TCVN 6904-2001;

- Overspeed governor: test methods and assessment carried out under Article 4.2.2 of TCVN 6904-2001;

- Cabin safety gear: tested at the speed which is below the rated speed (applied to progressive safety gear): test methods and assessment carried out under Section 4.2.3.1.2 of TCVN 6904: 2001;

- Pull: test methods and assessment carried out under Article 4.2.4 of TCVN 6904-2001;

The result is considered satisfactory if the lift operates as designed without signs of errors and requirements set forth in Section 8.3.2 are satisfied.

8.3.3. Measure the floor-landing deviation: carry out an assessment according to Section 8.7 of TCVN 6395:2008.

8.3.4. Inspect overload protection equipment: carry out the inspection and assessment according to Section 11.8.6 of TCVN 6395-2008.

8.3.5. Test the counterweight safety gear (if any): test methods and assessment carried out under Article 4.2.3.2.2 of TCVN 6904-2001.

8.3.6. Test automatic rescue device (if any): test and assess according to Section 4.2.6 of TCVN 6904:2001.

8.3.7. Test signalling device: test and assess according to Section 4.2.7 of TCVN 6904:2001.

8.3.8. Test special operating modes of the lift (if any).

- Operating mode of the lift in case of fire or earthquake;

- Prioritized operating mode.

9. INSPECTION RESULTS PROCESSING

9.1. Prepare an inspection record which contains sufficient information according to the form in the Appendix 02 hereto attached.

9.2. Approve the inspection record:

Mandatory participants in the process of approving the inspection record:

- The representative or a person authorized by the lift owner;

- A witness;

- The inspector.

When the record is approved, the inspectors, the witness, and the representative or a person authorized by the lift owner shall append their signatures and seals (if any) on the record. The record shall be made into 02 copies, one for each party.

9.3. Write the brief inspection result to the profile of the electric lift (including full names of inspectors and the date of inspection).

9.4. Put on the inspection stamp: if the inspection result of a lift is satisfactory, inspectors shall put an inspection stamp on it at a noticeable position.

9.5. Issuance of certificate of inspection results:

9.5.1. If the inspection result is satisfactory, the inspecting organization shall issue the certificate of inspection results to the lift within 5 working days from the date on which the inspection record is approved.

9.5.2. If the inspection result is not satisfactory, only the steps in 9.1 and 9.2 shall be taken and the inspection record must specify the explanation for unsatisfactory result, necessary remedial actions and a deadline for taking such actions. The inspection shall be sent to the employment authority of the area where the lift is located.

10. INSPECTION INTERVAL

10.1. An electric lift has to be inspected every 03 years. For the electric lift that has been used for more than 10 years, it has to be inspected every 02 years. For the electric lift that has been used for more than 20 years, it has to be inspected every year.

10.2. In the case where a shorter interval is demanded by the manufacturer or owner, such interval shall apply.

10.3. If the inspection interval is shortened, the inspector shall provide explanation in the inspection record.

10.4. If the inspection interval is specified in national technical regulations, such regulations shall apply.

APPENDIX 01

SPECIMEN OF THE ON-SITE RECORD

(Name of inspecting organization)	**THE SOCIALIST REPUBLIC OF VIETNAM**
-------	**Independence - Freedom - Happiness**

……..[place], ……..[date]

ON-SITE RECORD

No.:……..

(written by the inspector)

1- General information

Name of the lift:…….

Name of the owner:.....

Address (head office of the owner):……

Address (location) of the lift:……

Content of the meeting with the owner:

- Representative: (information)
- Witnesses:

2- Basic parameters:

Code:.....	Manufacturing year:	Rated speed: .....
Number of stops:	Number of fabrication:	Rated load:

Manufacturer:

.....

3- Document inspection:

- - Machine profile: …….
- Technical documents: …….

4- Code of measurement equipment:

5- External inspection:

- Insulation resistance:
- Machine room:
- Motor parameters:

Capacity:	Manufacturing year:	Rated current: .....
Code:.....	Serial	Voltage:

number:.....

Manufacturer: Rotational speed:

....

- Inspection of traveling cable - counterweight:
- Inspection of pulley:

6- Dimensions and distance (mm):

- Pit:
- Distance from the pit bottom to the top of fully compressed buffer:
- Distance from the bottom of counterweight to the top of fully compressed buffer:
- Distance from the pit bottom to the lowest part of cabin bottom:
- Distance from the cabin roof to the lowest part of well ceiling:
- Distance between the floor sill and the cabin door sill:
- Distance from counterweight to cabin:

7- Technical inspection:

- No-load testing:
- Testing at 110% load: + Motor current:
  + Speed:
  + Maximum floor-landing deviation:
- Testing at 125% load: + Electromagnetic brake:
  + Cabin safety gear:
  + Traction testing:
- Automatic rescue device testing:
- Overload protection equipment:
- Lift operating mode testing in case of fire or earthquake (if any):

8- Remedial actions: (if any)

WITNESS **INSPECTOR**

APPENDIX 02

SPECIMEN OF THE SAFETY INSPECTION RECORD

(Name of inspecting organization)

THE SOCIALIST REPUBLIC OF VIETNAM
Independence - Freedom - Happiness

……..[place], ……[date]

SAFETY INSPECTION RECORD
(ELECTRIC LIFT)

No.: …….

(According to on-site record No:……..)

We are:

1. 1. ……..Inspector number:.....

2. 2.……..Inspector number:.....

Inspecting organization:.…….…….…….…….

Registration for certificate of the inspecting organization No:……..

Name of the inspected lift:…….. ……..

……

Name of the lift owner:……..

Address (head office of the owner):……

Address (location) of the lift:……

Inspection procedures, applied standards: .....

Witness:……

1…… Position: ……

2…… Position: ……

I- PARAMETERS OF LIFT

Lift Class:	Manufacturing year:	Rated speed (m/ph): .....
Code:	Number of fabrication:	Rated load (kg): .....
Manufacturer:	Number of stops:	Uses: .....

II- FORMS OF INSPECTION

First time □ ; **Periodic** □ ; **Unscheduled** □

Reasons for unscheduled inspection:.…….……

III- INSPECTION CONTENT

1. DOCUMENT INSPECTION:

- Remark:

…….…….…….……..

- Evaluation of inspection results:

No.	INSPECTION CONTENT	SATISFACTORY	UNSATISFACTORY	NOTE
1	Profile			
2	Technical documents			

2. EXTERNAL INSPECTION:

- Remark:

…….……..……..…….

Adequacy and uniformity of the lift:

…….……

Defects - deformation: ……..……..…….

- Evaluation of inspection results Satisfactory □ Unsatisfactory □

3. TECHNICAL INSPECTION – NO-LOAD TEST:

- Remark: …….……..……..……..

- Evaluation of inspection results:

No.	INSPECTION CONTENT	SATISFACTORY	UNSATISFACTORY	NOTE
1	Well			
2	Machine room			
3	Motor			
4	Speed reducer			
5	Electromagnetic brake			
6	Pulley			
7	Overspeed governor			
8	Counterweight travelling cable			
9	Fixed points			
10	Cabin			
11	Counterweight			
12	Buffer			
13	Safety gear			
14	Electricity system			
15	Travel control equipment			
16	Landing door - control of opening and closing operation of door			
17	Distance between the pit bottom and the lowest part of cabin			
18	Distance between the cabin roof and the lowest part of well ceiling			
19	Distance between the floor sill			

	and the cabin door sill:			

4. TEST AT 100% OF RATED LOAD:

- Remark:

……..……..……..……..

- Evaluation of inspection results:

+ Cabin speed:	Result: Satisfactory □	Unsatisfactory □
+ Motor current:	Result: Satisfactory □	Unsatisfactory □
+ Maximum floor-landing deviation:	Result: Satisfactory □	Unsatisfactory □
+ Instantaneous safety gear and instantaneous safety gear with buffered effect:	Result: Satisfactory □	Unsatisfactory □

5. IN-MOTION LOADING TEST WHEREIN THE LIFT CARRIES 125% OF RATED LOAD:

- Remark:

……..……..……..……..

- Evaluation of inspection results:

+ Electromagnetic brake	Result: Satisfactory □	Unsatisfactory □
+ Progressive safety gear	Result: Satisfactory □	Unsatisfactory □
+ Traction testing:	Result: Satisfactory □	Unsatisfactory □

6. RESCUE SYSTEM TESTING:

- Remark:

……..……..……..……..

- Evaluation of inspection results:

+ Automatic rescue device (if any)	Result: Satisfactory □	Unsatisfactory □
+ Communication system (bell, internal telephone)	Result: Satisfactory □	Unsatisfactory □

IV- CONCLUSIONS AND RECOMENDADTIONS

1. Result: Satisfactory □ ; Unsatisfactory □

Eligibility for operation with the maximum load:…….(kg)

2. 2. Inspection stamp No:…… At:……

3. Remedial actions (if any): ……

Deadline for taking remedial actions: …….

V- INSPECTION INTERVAL

Date of next inspection: ……

Reasons for shortened interval (if any): ……

The record is approved on: …….…….

At: ……...

The record is made into of ……copies, each party holds…. copies./.

OWNER	WITNESS	INSPECTOR
(Signature and full name)	*(Signature and full name)*	*(Signature and full name)*

PROCEDURES FOR INSPECTION OF PRESSURE VESSEL

QTKD: 07 - 2016/BLDTBXH

Foreword

Procedures for inspection of safety of pressure vessel are drafted by the Department of Occupational Safety and promulgated together with the Circular No. 54/2016/TT-BLDTBXH dated December 28, 2016 of the Ministry of Labour, Invalids and Social Affairs.

PROCEDURES FOR INSPECTION OF PRESSURE VESSEL

1. SCOPE AND REGULATED ENTITIES

1.1. Scope

Such procedures shall be used for first, periodic and unscheduled inspection of safety of the pressure vessels with an operating pressure of more than 0.7 bar under QCVN 01-2008/BLDTBXH and under administration of the Ministry of Labour, Invalids and Social Affairs.

Such procedures shall not apply to vessels used for storing and transporting compressed gases, liquefied petroleum gases, dissolved gases, vessels with the product of volume (in liters) and pressure (in bars) not exceeding 200 bar litres, and vessels with a volume of less than 25 liters.

1.2. Regulated entities

- Organizations carrying out occupational safety inspection;
- Occupational safety inspectors.

2. REFERENCES

- QCVN 01:2008 - BLDTBXH - National technical regulation on safe work of steam boiler and pressure vessel;
- TCVN 8366:2010 - Pressure vessels - Requirement of design and manufacture;
- TCVN 6155:1996 - Pressure vessels - Safety engineering requirements of erection, use, repair;
- TCVN 6156:1996 - Pressure vessels - Safety engineering requirements of erection, use, repair, testing methods;
- TCVN 6008:2010 - Pressure equipment - Welds - Technical requirements and testing methods.

In the cases where national technical standards and regulations referred to in this document are amended or replaced, regulations of the latest documents shall apply.

Other standards may be applied to pressure vessel safety inspection at the request of its manufacturer or owner if such standards contain the same or higher safety criteria than those in the national standards referred to in this document.

3. TERMS AND DEFINITIONS

In addition to terms in the above invoked and referenced documents, the following terms are used in description of this procedure:

3.1. “pressure vessel” is the equipment used for carrying out thermal or chemical processes, storing and transporting solvents with pressure greater than atmospheric pressure.

3.2. “first safety inspection” is inspection of safety of the vessel according to national technical standards and technical safety standards after its installation and before its first use.

3.3. “periodic safety inspection” is inspection of safety of the vessel according to national technical standards and technical safety standards after expiration of the last safety inspection result.

3.4. “unscheduled safety inspection” is inspection of safety of the vessel according to national technical standards and technical safety standards and will be carried out:

- after a repair or upgrade that affects the safety of the vessel;
- when the vessels that have been inoperative for 12 months or more are reused;
- after relocation of the vessel (for the fixed vessel);
- at the request of the owner or a competent authority.

4. INSPECTION STEPS

Safety inspection shall be carried out in the following order:

- Inspection of the profile of the pressure vessel;
- External and internal inspection;
- Technical inspection and testing;
- Operational inspection;
- Processing inspection results.

Note: Only take the next step if the previous step is passed. The result of each step shall be recorded according to the form provided in the Appendix 01 and retained by the inspecting organization.

5. INSPECTION EQUIPMENT

Inspection equipment shall be inspected and calibrated in accordance with regulations and law. Inspection equipment includes:

- Hydraulic test pump;
- Manometer, test meters;
- Endoscopic flaw detector;
- Geometric inspection equipment;
- Insulation resistance meter;
- Ground resistance tester;
- Thermometer (if necessary);
- Gas leak detector (if necessary);

- Clamp meter;
- Lead sealing plier;
- Ultrasonic thickness meter;
- Nondestructive flaw detector (if necessary).

6. CONDITIONS FOR INSPECTION

The inspection must not be carried out unless the following conditions are met:

6.1. The pressure vessel is ready for inspection.

6.2. Documents about the vessel are adequate

6.3. The inspection is not affected by weather.

6.4. Occupational safety and occupational hygiene operation of the vessel are met.

7. PREPARATION FOR INSPECTION

Before carrying out inspection of a pressure vessel, the following tasks shall be performed:

7.1. Reach an agreement on an inspection plan, preparation for the inspection and cooperation between the inspecting organization and the owner, including the following tasks:

7.1.1. Prepare the documents about the vessel.

7.1.2. Remove solvents, clean the inside and outside of the vessel.

7.1.3. Remove part or whole of the thermal insulation layer if the surface of metal is suspected of being damaged. Remove the access doors or cleaning door (if any). 7.1.4. Prepare equipment for inspection of all components of the vessel.

7.1.4. In case of difficulty in inspecting the underground vessel, lift the vessel if possible or take other appropriate measures for inspection.

7.1.5. In case of the vessel with electric heaters or moving parts, remove them from the vessel.

7.1.6. For the vessel containing toxic and flammable solvents, dispose them so that the inspector is not affected.

7.1.7. Mobilize human resources and prepare equipment for inspection; assign staff to participate in and witness the inspection.

7.2. Inspect the profile of the pressure vessel.

The documents to be inspected vary according to the inspection. To be specific:

7.2.1 Regarding first inspection:

7.2.1.1. The profile of a vessel (under QCVN: 01-2008 - BLDTBXH), which consists of the following documents:

- Criteria for metals used for the vessel and welding,
- Calculation of strength of load-bearing parts;
- Structural drawings which specify all main dimensions;
- Guidelines for operation and maintenance;
- Certificate of conformity issued by authorized organizations in accordance with regulations and law in case a competent authority has issued national technical regulations on the inspected entity.

7.2.1.2. Release documents.

- Certificates of the metals used for the vessel and welding;

- Weld inspection result;

- Commissioning record.

7.2.1.3. Reports on calibration of measurement equipment; record on inspection of insulation resistance and protective devices (if any).

7.2.1.4. Documents on installation: Applied to the fixed vessel.

- Name of the manufacturer or owner;

- Characteristics of the additional materials used for installation;

- Welding data: welding technology, welding electrode code, name of the welder and welding-testing results;

- Records on inspection of each component of the vessel (if any).

7.2.2. Regarding periodic inspection:

7.2.2.1. The previous profile, inspection record and Certificate of inspection results.

7.2.2.2. Documents on the use, operation and maintenance of the vessel; inspection record (if any).

7.2.3. Regarding unscheduled inspection: Inspect the documents as if in the periodic inspection and other documents prescribed in the following cases:

7.2.3.1. In case of repair, renovation and upgrade: Documents on design, repair, renovation and upgrade; commissioning record after repair, renovation and upgrade;

7.2.3.2. In case of relocation: Installation documents.

The result is considered satisfactory if:

- The profile of the pressure vessel is adequate and satisfies Article 2.4 of QCVN 01-2008/BLDTBXH.

- If the inspection result is unsatisfactory, the owner shall take remedial actions according to Article 3.2.2 of QCVN 01-2008/BLDTBXH.

7.3. Prepare suitable and adequate equipment for inspection.

7.4. Develop measures for ensuring safety and reach an agreement with the owner before inspection. Provide adequate personal protective equipment to ensure safety during the inspection.

8. INSPECTION PROCESS

An inspection shall be carried out in the following order:

8.1. External inspection.

8.1.1. Inspect ground and position location of the pressure vessel.

8.1.2. Inspect operational lighting system.

8.1.3. Inspect working platform, stairs, hangers, etc.

8.1.4. Inspect electrical safety-grounding system and lightning protection system.

8.1.5. Check technical specifications specified on the label of the pressure vessel versus the profile of the vessel.

8.1.6. Inspect condition of the safety equipment, measuring equipment and auxiliary equipment in terms of quantity, types and technical specifications versus the design and prescribed standards.

8.1.7. Inspect valves on the pressure vessel in terms of quantity, types and technical specifications versus the design and prescribed standards.

8.1.8. Inspect condition of other auxiliary equipment in service of operations of the vessel.

8.1.9. Inspect condition of welds, and the metallic surface of load-bearing parts of the pressure vessel. In case of suspicion of damage, request the owner to carry out appropriate inspection.

8.1.10. Inspect technical condition of the insulation layer (if any).

8.1.11. Inspect joints.

The result is considered satisfactory if:

- the regulations specified in Section 3 of TCVN 6155:1996 are met;

- the regulations specified in Section 8 of TCVN 8366:2010 are met;

- there are no cracks, blisters, dents, excessive wear and tear, leaks of solvent of the load-bearing parts, welds and joints.

8.2. Internal inspection

8.2.1. Inspect the condition of metallic surface of load-bearing parts.

8.2.2. Inspect residues, rust, corrosion affecting the internal metallic surface of the pressure vessel.

8.2.3. Inspect condition of welds and metallic surface of the load-bearing parts. In case of suspicion of damage, request the owner to carry out appropriate inspection.

8.2.4. For the locations where internal inspection fails to be carried out, inspect technical condition according to the technical documentation of the manufacturer. The documentation shall clearly specify: inspection items, methods and procedures.

8.2.5. In case of shell-and-tube pressure vessel and suspicion of technical condition of the shell and tube, request the owner to remove part or whole of the shell and tube for inspection.

8.2.6. In case of failure to carry out internal inspection due to structural characteristics of the pressure vessel, replace the internal inspection with a hydrostatic test with the prescribed test pressure and inspection of the inspectable parts.

8.2.7. In case of detection of the flaws that reduce the strength of pressure wall (thin wall, eroded joints, etc.), the parameters of the pressure vessel shall be reduced by calculating the strength according to collected data.

The result is considered satisfactory if:

- the regulations specified in Section 3 of TCVN 8366: 2010 are met.

- there are no cracks, blisters, dents, excessive wear and tear, leaks of solvent of the load-bearing parts, welds and joints.

8.3. Technical inspection and test

8.3.1. The pressure vessel shall be exempted from strength test upon the first inspection if the duration of factory testing is within 18 months, the vessel is well maintained and shows no signs of impact and deformation after transport and installation. The inspection record shall clearly specify reasons and records on the manufacturer’s factory testing and record on installation commissioning (if any) shall be attached.

8.3.2. The vessel's chambers that operate at different pressure levels shall be separately tested.

8.3.3. During the inspection, isolation measures shall be taken to ensure that the automatic protective devices and measurement equipment are not damaged under the test pressure. In case of failure to ensure so, such equipment must be dismantled.

8.3.4. Strength test.

The strength of the pressure vessel shall be tested for every 6 years at the maximum and the strength shall be tested in accordance with the following requirements (including the unscheduled inspection according to Section 3.12 of TCVN 6156:1996):

8.3.4.1. The test solvent is liquid (water, non-corrosive and non-toxic liquid), gas (inert gas, air). The temperature of the test solvent is below 50°C and not 5°C lower than ambient temperature.

8.3.4.2. The test pressure and time for maintaining test pressure are specified in Table 1 below.

Table 1: Test pressure and time for maintaining test pressure

Types of vessel	Working pressure (bar)	Test pressure (bar)	Maintenance time (minute)
Vessels with a wall temperature of up to 200°C (Except for the cast vessels)	< 5	$1.5P_{lv}$ but not less than 2 bar	5
	≥ 5	1.25 P_{lv} but not less than P_{lv} + 3 bar	5
Vessels with a wall temperature of from 200°C to 400°C	Regardless of working pressure	Not less than 1.5 P_{lv}	5
Vessels with a wall temperature of above 400°C	Regardless of working pressure	Not less than 2 P_{lv}	5
Cast vessels	Regardless of working pressure	1.5 P_{lv} but not less than than 3 bar	5
Enameled vessels	Regardless of working pressure	Tested according to regulations of the manufacturer, but not less than P_{lv}.	5

P_{lv} - *Working pressure.*

8.3.4.3. Procedures for strength test:

8.3.4.3.1. Fill test solvent: Fill the vessel with test solvent. (pay attention to the discharge of gas when tested with fluid)

8.3.4.3.2. Increase the pressure to test pressure (gradually increase it to avoid sudden expansion that damages the vessel, and do not hammer at the test pressure). Monitor and detect unusual signs during the test.

8.3.4.3.3. Maintain the test pressure as prescribed.

8.3.4.3.4. Gradually drop the pressure to the working pressure and maintain it throughout the inspection. Drop the pressure to (0); repair the damage (if any) and re-inspect.

8.3.4.4. In case of failure to run the strength test with fluid due to the stress on prestressed bed or inlaid floor or difficulty in discharging liquid solvent or due to the inner liner preventing the liquid solvent from entering the vessel, run the strength test with gas.

8.3.4.4.1. The strength test with gas shall only be allowed to run if the external and internal inspection show good results and the strength shall be calculated and inspected according to the measurements obtained.

8.3.4.4.2. The following safety measures shall be taken when the strength test with gas is run:

- Valves and meters on the gas intake pipe must be removed from the place where the vessel is located or outside the booth where the vessel is located;

- Throughout the test, unauthorized persons must stay away from the vessel.

8.3.4.4.3. Test for gas leak by using soap solution or taking other measures. Do not hammer the vessel wall throughout the test.

The test result is considered satisfactory if:

- cracks are not found;

- gas bubbles, water spray or leak through welds and joints are not found;

- deformation is not found;

- the pressure is not reduced while the test pressure is maintained. If the test pressure is reduced until 3% due to the leak through valves, flanges, etc., the strength test is also considered satisfactory.

8.3.5. Leak test:

The leak test shall only be applied in case of technological requirements, the vessels containing toxic or flammable solvents or at the request of the manufacturer.

8.3.5.1. Pressure, solvent and maintenance time are specified in Table 2.

Table 2. Pressure, solvent and maintenance time for leak test

Types of vessel	Test pressure (bar)	Test solvents	Maintenance time (minute)
Vessel of all types	P_{lv}	Air or inert gas	Maintained throughout the test but not less than 30 minutes

P_{lv} - Working pressure.

8.3.5.2. Fill the vessel with solvent and increase the pressure to test pressure.

8.3.5.3. Detect leak by using soap solution or taking other measures.

The test result is considered satisfactory if:

- gas leak is not detected;

- the allowable pressure drop during the maintenance of test pressure is less than or equal to 0.5% test pressure.

8.4. Operational inspection.

8.4.1. Inspect the satisfaction of all conditions for the first use of the vessel.

8.4.2. Inspect the operation of the vessel and its accessories; operation of protective devices and measurement equipment.

8.4.3. When the vessel operates stably, increase the pressure for inspection, adjust the working pressure of safety valves and seal the safety valves with lead (except for the vessel containing toxic or flammable solvents).

8.4.4. It is not required to adjust and seal the safety valve during the test.

8.4.5. Safety valve adjustment value: The installed pressure of a safety valve shall not exceed the following value:

- P_{lv} + 0.5 bar - When the working pressure reaches 3 bar.

- P_{lv} +15% P_{lv} - When the working pressure reaches from 3 bar to 60 bar.

- P_{lv} + 10% P_{lv} - When the working pressure reaches above 60 bar.

The result is considered satisfactory if the pressure vessel, auxiliary equipment and measurement equipment operate normally and the indicators are stable.

9. PROCESSING INSPECTION RESULTS

9.1. Prepare an inspection record which contains sufficient information according to the form in the Appendix 02 hereto attached.

9.2. Approve the inspection record:

Mandatory participants in the process of approving the inspection record:

- The representative or a person authorized by the vessel owner;

- A witness;

- The inspector.

When the record is approved, the inspectors, the witness, and the representative or a person authorized by the vessel owner shall append their signatures and seals (if any) on the record. The record shall be made into 02 copies, one for each party.

9.3. Write the brief inspection result to the profile of the pressure vessel (including full names of inspectors and the date of inspection).

9.4. Put on the inspection stamp: if the inspection result of a pressure vessel is satisfactory, inspectors shall put an inspection stamp on it at a noticeable position.9.5. Issuance of certificate of inspection results:

9.5.1. If the inspection result is satisfactory, the inspecting organization shall issue the certificate of inspection results to the pressure vessel within 5 working days from the day on which the inspection record is approved.

9.5.2. If the inspection result is not satisfactory, only the steps in 9.1 and 9.2 shall be taken and the inspection record must specify the explanation for unsatisfactory result, necessary remedial actions and a deadline for taking such actions. The inspection shall be sent to the employment authority of the area where the pressure vessel is located.

10. INSPECTION INTERVAL

10.1. A pressure vessel has to be inspected every 3 years. For the vessel that contains corrosive or inflammable solvents and vessel that has been used for more than 12 years, they have to be inspected every 02 years.

10.2. For the vessel that contains corrosive or inflammable solvents and has been used for more than 12 years, and vessel that has been used for more than 24 years, they have to be inspected every year.

10.3. In the case where a shorter interval is demanded by the manufacturer or owner, such interval shall apply.

10.4. If the inspection interval is shortened, the inspector shall provide explanation in the inspection record.

10.5. If the inspection interval is specified in national technical regulations, such regulations shall apply.

PROCEDURES FOR INSPECTION OF TECHNICAL SAFETY OF BRIDGE TYPE LIFTING EQUIPMENT (BRIDGE CRANES, GANTRY CRANES, SEMI-GANTRY CRANES AND ELECTRIC HOISTS)

QTKD:09- 2016/BLDTBXH

Foreword

Procedures for inspection of technical safety of bridge type lifting equipment are drafted by the Department of Work Safety and promulgated together with the Circular No. 54/2016/TT-BLDTBXH dated December 28, 2016 of the Ministry of Labour, Invalids and Social Affairs.

PROCEDURES FOR INSPECTION OF TECHNICAL SAFETY OF BRIDGE TYPE LIFTING EQUIPMENT

1. SCOPE AND REGULATED ENTITIES

1.1. Scope

Such procedures shall be used for first, periodic and unscheduled inspection of bridge type lifting equipment (including bridge cranes, gantry cranes, semi-gantry cranes and electric hoists) and under state management of the Ministry of Labour, Invalids and Social Affairs.

Such procedures shall not apply to bridge type lifting equipment placed on floating work platforms.

According to such procedures, organizations carrying out occupational safety inspection shall directly apply or establish specific and detailed procedures for each model and type of bridge type lifting equipment provided that those procedures are not contrary to those specified in this document.

1.2. Regulated entities

- Organizations carrying out occupational safety inspection;
- Occupational safety inspectors.

2. Normative references

- QCVN 7: 2012/BLDTBXH, National technical regulation on safe work of lift appliances.
- QCVN 30: 2016/BLDTBXH, National technical regulation on safe work for overhead, gantry cranes;
- TCVN 4244:2005, Lifting appliances - Design construction and survey;
- TCVN 8242-1:2009 (ISO 4306-1:2007) Cranes - Vocabulary - Part 1: General;

- TCVN 10837:2015, Cranes - Wire ropes - Care and maintenance, inspection and discard;

- TCVN 5206:1990, Loading crane - Safety requirements for counter - weight and ballast;

- TCVN 5207:1990, Loading crane - Safety requirements;

- TCVN 5209:1990, Loading crane - Safety requirements for electrical equipment;

- TCVN 5179:90, Hoisting cranes - Test requirements of hydraulic equipment for safety;

- TCVN 9358:2012, Installation of equipment earthing system for industrial projects - General requirements;

- TCVN 9385:2012, Protection of structures against lightning - Guide for design, inspection and maintenance;

In the cases where the abovementioned normative references are amended or replaced, regulations of the latest documents shall apply.

Other standards may be applied to bridge type lifting equipment inspection at the request of its user or manufacturer if such standards contain the same or higher safety criteria than those in the national standards referred to in this document.

3. TERMS AND DEFINITIONS

In addition to terms and definitions in the abovementioned normative references, the following terms and definitions are used in description of this procedure:

3.1. “bridge type lifting equipment” includes bridge cranes, gantry cranes, semi-gantry cranes and electric hoists.

3.2. “first safety inspection” means the inspection of technical safety of equipment according to national technical standards and technical safety standards after its installation and before its first use.

3.3. “periodic safety inspection” means the inspection of technical safety of equipment according to national technical standards and technical safety standards after expiration of the last safety inspection result.

3.4. “unscheduled safety inspection” means the inspection of technical safety of equipment according to national technical standards and technical safety standards and will be carried out:

- after a repair, upgrade or renovation that affects the safety of equipment;

- after change of the location of installation;

- at the request of the user or a competent authority.

4. INSPECTION STEPS

Safety inspection shall be carried out in the following order:

- Inspection of the equipment profile and documents;

- External inspection;

- Technical inspection - No-load test;

- Load test - Test methods;

- Inspection result processing.

Note: Only take the next step if the equipment passes the test in the previous step. The result of each step shall be documented according to the form in the Appendix 01 and retained by the inspecting organization.

5. INSPECTION EQUIPMENT

Inspection equipment shall be inspected and calibrated in accordance with regulations. Inspection equipment includes:

- Theodolite;
- Altimeter (speedometer);
- Distance measuring equipment;
- Geometric inspection equipment;
- Dynamometer or hanging scale;
- Insulation resistance meter;
- Ground resistance tester;
- Multimeter;
- Clamp meter;
- Automatic level (if necessary).

6. CONDITIONS FOR INSPECTION

The inspection must not be carried out unless the following conditions are met:

6.1. The equipment is at the ready for inspection.

6.2. Documents about the equipment are adequate.

6.3. The inspection is not affected by environment or weather.

6.4. Requirements concerning occupational safety and health are met.

7. PREPARATION FOR INSPECTION

7.1. Before carrying out the inspection, the inspecting organization and the user shall reach an agreement on an inspection plan and prepare for the inspection and assign staff to participate in and witness the inspection.

7.2. Inspect the equipment profile and documents. The following documents shall be inspected according to inspection regulations:

7.2.1. Regarding first inspection:

- The bridge type lifting equipment profile and documents. The following documents shall be considered:

+ Calculation of strength of load-bearing parts (if any);

+ Structural drawings which specify all main dimensions and specifications;

+ Operating principle diagram and main technical specifications of electric, hydraulic or pneumatic transmission system, and control devices and arrangement of safety devices;

+ Assembly drawings of lifting equipment, wiring diagram;

+ Guidelines for operation and maintenance.

- Release documents:

+Certificates of the metals used for the equipment and welding (according to 3.1.2 of TCVN 4244: 2005);

+ Welding joint inspection result (according to 3.3.4 of TCVN 4244: 2005);

+ Factory acceptance record.

- Reports on results and records on inspection of earthing, lightning protection, motor insulation resistance and protective devices (if any);

- Documents on installation;

- Certificate of conformity issued by authorized organizations in accordance with regulations.

7.2.2. Regarding periodic inspection:

- The previous profile, inspection record and certificate of inspection result;

- Documents on the use, operation and maintenance of the equipment; inspection record (if any).

7.2.3. Regarding unscheduled inspection:

- In case of renovation or repair: documents on renovation or repair and commissioning record.

- In case of relocation: installation documents;

- The inspection record issued by competent authority (if any).

The document inspection result is satisfactory if the documents are adequate and the regulations of QCVN 7:2012/BLDTBXH are observed. If the result is unsatisfactory, the user shall take remedial actions.

7.3. Prepare suitable and adequate equipment for inspection.

7.4. Develop measures for ensuring safety and reach an agreement with the user before inspection. Provide adequate personal protective equipment to ensure safety during the inspection.

8. INSPECTION PROCESS

An inspection shall be carried out in the following order:

8.1. External inspection:

8.1.1. Check the location of installation of equipment, electrical system, user manual, protective fences, ground, distance and safety measures, notable obstacles during the inspection; conformity of the parts and specifications of the equipment with those specified in the profile and documents.

8.1.2. Check all mechanisms or parts of the lifting equipment individually, pay particular attention to the condition of the following parts:

- Metal structure of lifting equipment, welds, riveted joints (if any), bolted joints of metal structures, control rooms, ladders, floors and guards;

- Hooks and parts of hooks (Appendix 13A, 13B, 13C TCVN 4244: 2005);

- Ropes inspected and discarded according to TCVN 10837:2015;

- Rope fixing parts: meet the manufacturer's requirements or refer to Annex 18C, 21 TCVN 4244: 2005;

- Pulleys, shafts and parts used to fix the shaft sleeves (Appendix 19A, 20A, 20B TCVN 4244: 2005);

- Rails (Appendix 5 TCVN 4244 : 2005);

- Safety devices (hoisting limiter, lowering limiter; travelling and traversing limiter; anti-overload devices);

- Earth resistance which must not exceed 4.0Ω, electric motor's insulation resistance which is at least 0.5 M Ω (test voltage 500V);

- Brakes inspected according to 1.5.3.3 of TCVN 4244:2005.

The equipment passes the test if it is installed according to technical documentation, no damage or defect is found and the requirements in section 8.1 are met.

8.2. Technical inspection - No-load test:

- Conduct no-load tests of mechanisms and equipment, including all electrical mechanisms and equipment, safety devices, brakes, control and lighting devices, signals, sounds;

- Conduct the abovementioned tests at least 03 (three) times.

The equipment passes the test if its mechanisms and safety devices operate according to their specifications and design.

8.3. Loaded test - Test methods:

8.3.1. Static test:

- Conduct static test of bridge type lifting equipment according to 4.3.2- TCVN 4244: 2005.

- Test load is 125% of Qtk or 125% of Qsd, where:

+ Qtk: design load;

+ Qsd: load required by the user (the load required by the user must be less than the design load and depend on the actual quality of the device).

The equipment passes the test if the load remains constant while it is being held for 10 (ten) minutes and after the load is lowered, the structures and parts of equipment have no crack, residual strain or other damage (according to 4.3.2-TCVN 4244-2005).

8.3.2. Dynamic test:

- Conduct dynamic test of bridge type lifting equipment depending on the type of equipment and according to 4.3.2- TCVN 4244: 2005.

- Test load is 110% of Qtk or 110% of Qsd. Hoist and lower the test load three times and check other mechanisms bearing such load.

The equipment passes the test if its of equipment operate as designed, requirements of applicable technical safety standard are met and no crack, residual strain or other damage is found.

8.3.3. For lifting equipment operating in special environment:

8.3.3.1. Regarding lifting equipment only used to hoist and lower load (lifting irrigation and hydropower sluice gates):

- Conduct static test according to 8.3.1;

- Conduct dynamic test with a load of 110% of the design load or load recommended by the user (according to 4.3.2- TCVN 4244: 2005) when the equipment and trolley are not moved. Hoist and lower the load three times and check hoisting and lowering mechanisms bearing such load.

The equipment passes the test if its mechanisms and parts of equipment operate as designed, requirements of applicable technical safety standard are met and no crack, residual strain or other damage is found.

8.3.3.2. When conducting static and dynamic tests of bridge cranes serving thermal power plants, hydropower plants and irrigation stations, specialized equipment may be used to create test load without using load (hydraulic cylinders and pistons are commonly used to create test load).

In this case, the equipment user or provider or installation service provider must establish a procedure for operating the equipment to create test load and such procedure must be confirmed by the parties concerned. All measuring, interlocking and safety devices of the equipment for creating test load shall be inspected in accordance with regulations.

- Conduct static test according to 8.3.1;

- Conduct dynamic test with a load of 110% of the design load or load recommended by the user at least 01 (one) full turn around the drum. Hoist and lower the load three times and check hoisting and lowering mechanisms bearing such load.

The equipment passes the test if its mechanisms and parts of equipment operate as designed, requirements of applicable technical safety standard are met and no crack, residual strain or other damage is found.

9. INSPECTION RESULT PROCESSING

9.1. Prepare an inspection record which contains sufficient information according to the form in the Appendix 02 enclosed herewith.

9.2. Approve the inspection record:

Mandatory participants in the process of approving the inspection record:

- The representative of the user or a person authorized by the user;

- A witness;

- The inspectors.

When the record is approved, the inspector, the witness, and the representative of the user or a person authorized by the user shall append their signatures and seals (if any) on the record. The record shall be made into two (02) copies, each party shall keep 01.

9.3. Write the brief inspection result to the profile of the bridge type lifting equipment (including full names of the inspectors and the date of inspection).

9.4. Put on the inspection stamp: if the equipment passes the test, the inspector shall put an inspection stamp on it at a noticeable position.

9.5. Issuance of certificate of inspection results:

9.5.1. If the equipment passes the test, the inspecting organization shall issue the certificate of inspection result to the lifting equipment within 05 working days from the date on which the inspection record is approved.

9.5.2. If the equipment fails the test, only the steps in 9.1 and 9.2 shall be taken and the inspection record must specify the explanation for the failure, necessary remedial actions and a deadline for taking such actions. The inspection record shall be sent to the employment authority of the area where the bridge type lifting equipment is installed and located.

10. INSPECTION INTERVAL

10.1. Bridge type lifting equipment has to be inspected every 03 years. For the type lifting equipment that has been used for more than 12 years, it has to be inspected every year.

10.2. In the case where a shorter interval is demanded by the manufacturer or user, such interval shall apply.

10.3. If the inspection interval is shortened, the inspector shall specify explanation in the inspection record.

10.4. If the inspection interval is specified in national technical regulations, such regulations shall apply.

Appendix 01

SPECIMEN OF THE ON-SITE RECORD
(INSPECTION OF TECHNICAL SAFETY OF BRIDGE TYPE LIFTING EQUIPMENT)

(Name of inspecting organization)	**THE SOCIALIST REPUBLIC OF VIETNAM**
-------	**Independence - Freedom - Happiness**

……..[place], ……..[date]

ON-SITE RECORD

No. .....

(written by the inspector)

1- General information

Name of the equipment:

…….…….…….…….

Name of the user: …….…….…….…….

Address (head office of the user): …….…….…….……

Address (location) of the equipment:

…….…….…….

Content of the meeting with the user:

- Representative: (information)
- Witnesses:

2. Basic specifications

- Code:.....	- Trolley speed:.....m/min
- Production number:.....	- Equipment speed:.....m/min
- Production year:	- Aperture, cantilever:.....m
- Manufacturer:	- Lifting height of (main and auxiliary) hooks:..... m
- Design load:..... tonnes	- Load at cantilever's free end: ……tonnes
- Lifting speed:.....m/min	**- Uses: .....**

3- Document inspection:

- Machine profile:

- Technical documents:

4- Code of measuring and testing equipment:

5- Equipment inspection:

a. External inspection:

+ Metal structure:

+ Hook and pulley assembly:…

+ Wire ropes and wire rope fixation:…

+ Protective earthing:

+ Rails and rail fixation:

+ Brakes:….

+ Safety devices:

b. Technical inspection:

- 125% load test:(10-minute hold)

+ Brakes: ……

+ Metal structure:….

- 110% dynamic test:

+ Brakes (load holding)

+ Mechanisms and parts:

+ Metal structure:

6- Inspection of limiters, load indicator, overload indicator.

7. Processing and evaluation of inspection results.

8- Recommendation(s): (if any)

WITNESS	**INSPECTOR**
(Signature and full name)	(*Signature and full name)*

Appendix 02

SPECIMENT OF RECORD ON INSPECTION OF TECHNICAL SAFETY OF BRIDGE TYPE LIFTING EQUIPMENT

(Name of inspecting organization)	**THE SOCIALIST REPUBLIC OF VIETNAM**
-------	**Independence - Freedom - Happiness**

……..[place], ……..[date]

TECHNICAL SAFETY INSPECTION RECORD
(FOR BRIDGE TYPE LIFTING EQUIPMENT)

No. …….

(According to the On-site Record No. ……..)

We are:

1. …… Inspector number:

……

2. …… Inspector number:

……

Inspecting organization:

……

Registration certificate No. …….

Name of the inspected equipment:……. ……

Name of the user: …….…….…….

Address (head office of the user):…… …

Address (location) of the equipment:……

Inspection procedure and standards applied: ……

Individuals witnessing and approving the record:…… ……

1…… Position:……

2…… Position:……

I- BASIC SPECIFICATIONS OF EQUIPMENT

- Code:..... - Trolley speed:.....m/min
- Production number:..... - Equipment speed:.....m/min
- Production year: ..... - Aperture, cantilever:.....m
- Manufacturer: ..... - Lifting height of (main and auxiliary) hooks:..... m
- Design load:..... tonnes - Load at cantilever's free end: ……tonnes
- Hoisting/Lowering speed:.....m/min - **Uses: .....**

II- FORMS OF INSPECTION

First time □ ; Periodic □ ; Unscheduled □

Reasons for unscheduled inspection: …….……

III- INSPECTION CONTENT:

A- Technical document inspection:

- Comments:…….....
- Result evaluation:

No.	Item	Passed	Failed	Note
1	Profile			

B-Technical inspection; no-load test:

- Comments:……...

- Result evaluation:

No.	Mechanism; part	Passed	Failed	Note
1	Main hook/auxiliary hook			
2	Pulley assembly			
3	Main hoist rope			
4	Auxiliary hoist rope			
5	Main hoist brake			
6	Auxiliary hoist brake			
7	Trolley brake			
8	Rail, rail gauge			
9	Metal structure of main girders; attachments to the building			
10	Crane frame			
11	Crane brake			

No.	Mechanism; part	Passed	Failed	Note
12	Main hoist mechanism			
13	Auxiliary hoist mechanism			
14	Trolley motion mechanism			
15	Crane travelling mechanism			
16	Rail clip			
17	Whistle (bell)			
18	Height limiter			
19	Trolley traversing limiter			
20	Electrical system			
21	Control system			
22	Crane travelling limiter			

C-Load test: (design/uses)

- Comments:…….....

- Result evaluation:

No.	Load holding position and test result	Passed	Failed	Equivalent load (tonnes)	Static test (tonnes)	Dynamic load test (tonnes)
1	Mid-aperture					
2	At cantilever’s free end					
3	Stability					

No.	Result evaluation	Passed	Failed	Note
1	Metal structure			
2	Control system			
3	Anti-overload device			
4	Hoist rope			

No.	Result evaluation	Passed	Failed	Note
5	Hoist brake			
6	Trolley brake			
7	Crane brake			

IV- CONCLUSIONS AND RECOMMENDATIONS

1. Result: Passed □ Failed □

Maximum load: ..... tonnes.

2. Inspection stamp No:…… At:……

3. Recommendations: ……..……..……..……..……..……..……..……..

Deadline for implementation of recommendations:…….. ……..

V- INSPECTION INTERVAL

Date of next inspection:

Reasons for shortened interval (if any):

The record is approved on:

At:…….

The record is made into of ……copies, each party holds…. copies.

EQUIPMENT USER *(Signature and seal)* *(Undertaking to fulfill recommendations in sufficient and timely manner)*	***WITNESS*** ***(Signature and full name)***	***INSPECTOR*** ***(Signature and full name)***

PROCEDURES FOR TECHNICAL INSPECTION OF SAFETY OF MOBILE CRANES

QTKD: 10- 2016/BLDTBXH

Foreword

Procedures for inspection of technical safety of mobile cranes are drafted by the Department of Work Safety and promulgated together with the Circular No. 54/2016/TT-BLDTBXH dated December 28, 2016 of the Ministry of Labour, Invalids and Social Affairs.

PROCEDURES FOR TECHNICAL INSPECTION OF SAFETY OF MOBILE CRANES

1. SCOPE AND REGULATED ENTITIES

1.1. cope

Such procedures shall be used for first, periodic and unscheduled inspection of mobile cranes under state management of the Ministry of Labour, Invalids and Social Affairs.

Such procedures shall not apply to the abovementioned mobile cranes placed on floating work platforms.

1.2. Regulated entities

- Organizations carrying out occupational safety inspection;

- Occupational safety inspectors.

2. NORMATIVE REFERENCES

- QCVN 7: 2012/BLDTBXH, National technical regulation on safe work of lift appliances;

- QCVN 29: 2016/BLDTBXH, National technical regulation on safe work for Cranes;

- TCVN 8590-2:2010 (ISO 4301-2:2009), Part 2: Mobile cranes.

- TCVN 8242-2:2009, Cranes - Vocabulary - Part 2, Mobile cranes;

- TCVN 10837:2015, Cranes - Wire ropes - Care and maintenance, inspection and discard;

- TCVN 8855-2:2011. Cranes and lifting appliances. Selection of wire ropes. Part 2: Mobile cranes. Coefficient of utilization;

- TCVN 4244:2005, Lifting appliances – Design construction and survey;

- TCVN 5206:1990, Loading crane - Safety requirements for counter - weight and ballast;

- TCVN 4755:1989, Crane. Safety requirements for hydraulic equipment;

- TCVN 5179:1990, Hoisting cranes - Test requirements of hydraulic equipment for safety.

In the cases where the abovementioned normative references are amended or replaced, regulations of the latest references shall apply.

Other standards may be applied to mobile cranes at the request of their user or manufacturer if such standards contain the same or higher safety criteria than those in the national standards referred to in this document.

3. TERMS AND DEFINITIONS

For the purposes of this document, the terms and definitions given in the abovementioned normative references and the following shall apply:

3.1. “mobile crane” means a boom type crane, which may be fitted with a mast (tower attachment) capable of travelling, laden or unladen, without the need for fixed runways and which relies on gravity for stability.

3.2. “first safety inspection” means the inspection of technical safety of equipment according to national technical standards and technical safety standards after its installation and before its first use.

3.3. “periodic safety inspection” means the inspection of technical safety of equipment according to national technical standards and technical safety standards after expiration of the last safety inspection result.

3.4. “unscheduled safety inspection” means the inspection of technical safety of equipment according to national technical standards and technical safety standards and will be carried out:

- after a repair, upgrade or renovation that affects the safety of equipment;

- after change of the location of installation;

- at the request of the user or a competent authority.

4. INSPECTION STEPS

Safety inspection shall be carried out in the following order:

- Inspection of the equipment profile and documents;
- External inspection;
- Technical inspection - No-load test;
- Load test - Test methods;
- Inspection result processing.

Note: Only take the next step if the equipment passes the test in the previous step. The result of each step shall be documented according to the form in the Appendix 01 and retained by the inspecting organization.

5. INSPECTION EQUIPMENT

Inspection equipment shall be inspected and calibrated in accordance with regulations. Inspection equipment includes:

- Theodolite;
- Altimeter (speedometer);
- Distance measuring equipment;
- Geometric inspection equipment;
- Dynamometer or hanging scale;
- Ground resistance meter;
- Multimeter;
- Clamp meter;
- Automatic level (if necessary).

6. CONDITIONS FOR INSPECTION

The inspection must not be carried out unless the following conditions are met:

6.1. The equipment is at the ready for inspection.

6.2. Documents about the equipment are adequate.

6.3. The inspection is not affected by environment or weather.

6.4. Requirements concerning occupational safety and health are met.

7. PREPARATION FOR INSPECTION

7.1. Before carrying out the inspection, the inspecting organization and the user shall reach an agreement on an inspection plan and prepare for the inspection and assign staff to participate in and witness the inspection.

7.2. Inspect the equipment profile and documents. The following documents shall be inspected according to inspection regulations:

7.2.1. Regarding first inspection:

- The profile and technical documents on the equipment (inspected under 3.1 of QCVN 29:2016/BLDTBXH and 3.5.1.5 of QCVN 7: 2012/BLDTBXH).
- Certificate of conformity issued by the designated organization as prescribed.

7.2.2. Regarding periodic inspection:

- The profile and technical documents on the equipment

- Documents on the use, operation and maintenance of the equipment, results of previous inspections.

7.2.3. Regarding unscheduled inspection:

- Profile and technical documents on the equipment (in case of renovation or repair, documents on renovation, documents on renovation or repair and commissioning records are required).

- Documents on the use, operation and maintenance of the equipment, results of previous inspections.

- Results of inspections and tests and implementation of recommendations.

The document inspection result is satisfactory if the documents are adequate and the regulations in 7.2 are observed. If the result is unsatisfactory, the user shall take remedial actions.

7.3. Prepare suitable and adequate equipment for inspection.

7.4. Develop measures for ensuring safety and reach an agreement with the user before inspection. Provide adequate personal protective equipment to ensure safety during the inspection.

8. INSPECTION PROCESS

An inspection shall be carried out in the following order:

8.1. External inspection:

8.1.1. Check the location of the equipment, protective fences, distance and notable obstacles during the inspection.

8.1.2. Check the conformity of parts of the equipment with those specified in the documents/profile.

8.1.3. Check all mechanisms or parts of the lifting equipment individually, pay particular attention to the condition of the following parts:

- Metal structure of the lifting equipment: important load-bearing welds, riveted joints (if any), bolted joints between turntable and base frame (according to Appendix 6 of TCVN 4244:2005), control cabin.

- Hooks and parts of hook assembly (inspected and assessed according to Appendix 13A, 13B, 13C of TCVN 4244: 2005).

- Ropes inspected and discarded according to TCVN 10837:2015;

- Rope fixing parts (meeting the manufacturer's requirements or referring to Appendices 18C and 21 of TCVN 4244: 2005).

- Pulleys, shafts and parts used to fix the shaft sleeves (Appendices 19A, 20A and 20B of TCVN 4244: 2005).

- Safety devices (overload limiter; hoisting limiter, lowering limiter; derricking device, telescoping limiter);

- Brake mechanisms.

- Counter-weight and counter-weight frames: assessed according to TCVN 5206:1990.

The equipment passes the test if no damage or defect affecting its mechanisms and parts is found and the requirements in section 8.1 are met.

8.2. Technical inspection - No-load test:

8.2.1. Conduct no-load tests of mechanisms and systems (according to 4.3.2 of TCVN 4244-2005), including:

- Hook and boom hoisting and lowering mechanisms, slewing mechanism, equipment travelling mechanism (in the case of a crawler crane).

- Safety devices: hook hoisting and lowering limiter, boom hoisting and lowering limiter, overload limiter (if any), radius indicator and corresponding load.

- Brakes for boom and hook hoisting and lowering mechanisms.

- Control and lighting devices, signals, sounds.

- Conduct the abovementioned tests at least 03 times.

The equipment passes the test if its mechanisms and safety devices operate according to their specifications and design and satisfy the regulations set out in 8.2.

8.3. Load test - Test methods:

8.3.1. Static test:

- Test load: at 125% of SWL or 125% of Q(sd), where:

+ SWL: safe working load of the equipment;

+ Q(sd): the load required by the user must not be greater than the design load and depend on the actual quality of the equipment.

- When hoisting the load, check the function of the overload limiter at these positions. The overload limiter must prevent mechanisms from continuing to operate beyond the equipment's safe limits and such mechanisms are only permitted to operate in the opposite direction to bring the load back to a safe level.

- Hold the load at two positions at the minimum and maximum radius based on the characteristics of the equipment’s load and comply with the regulations enshrined in 4.3.2 of TCVN 4244:2005.

The equipment passes the test if, during the 10 minute load test period, there is no crack, permanent deformation or other damage and the regulations set out in 4.3.2 of TCVN 4244:2005 are satisfied.

8.3.2. Dynamic test:

- Test load: at 110% of SWL or 110% of Q(sd).

- Hold the load at two positions at the minimum and maximum radius based on the characteristics of the equipment’s load and comply with the regulations enshrined in 4.3.2 and 4.3.3 of TCVN 4244:2005.

The equipment passes the test if the load remains constant during the test period and no crack, permanent deformation or other damage are present on its mechanisms and parts after the load is lowered, and the regulations set out in 4.3.2 and 4.3.3 of TCVN 4244-2005 are satisfied.

9. INSPECTION RESULT PROCESSING

9.1. Prepare an inspection record which contains sufficient information according to the form in the Appendix 02 enclosed herewith.

9.2. Approve the inspection record:

Mandatory participants in the process of approving the inspection record:

- The representative of the user or a person authorized by the user;
- A witness;
- The inspectors.

When the record is approved, the inspectors, the witness, and the representative of the user or a person authorized by the user shall append their signatures and seals (if any) on the record. The record shall be made into two (02) copies, each party shall keep 01.

9.3. Write the brief inspection result to the profile of the equipment (including full names of the inspectors and the date of inspection).

9.4. Put on the inspection stamp: if the equipment passes the test, the inspector shall put an inspection stamp on it at a noticeable position.

9.5. Issuance of certificate of inspection result:

9.5.1. If the equipment passes the test, the inspecting organization shall issue the certificate of inspection result to the equipment within 05 working days from the date on which the inspection record is approved.

9.5.2. If the equipment fails the test, only the steps in 9.1 and 9.2 shall be taken and the inspection record must specify the explanation for failed result, necessary remedial actions and a deadline for taking such actions. The inspection record shall be sent to the employment authority of the area where the equipment is installed and located.

10. INSPECTION INTERVAL

10.1. A mobile crane has to be inspected every 02 years. For the mobile crane that has been used for more than 10 years, it has to be inspected every year.

10.2. In the case where a shorter interval is demanded by the manufacturer or user, such interval shall apply.

10.3. If the inspection interval is shortened, the inspector shall specify explanation in the inspection record.

10.4. If the inspection interval is specified in national technical regulations, such regulations shall apply.

Appendix 01

SPECIMEN OF THE ON-SITE RECORD
(FOR MOBILE CRANES)

(Name of inspecting organization)	**THE SOCIALIST REPUBLIC OF VIETNAM**
-------	**Independence - Freedom - Happiness**

…….. [place], ……[date]

ON-SITE RECORD

(written by the inspector)

1- General information

Name of the equipment:

…….…….…….…….

Name of the user: …….…….…….…….

Address (head office of the user): …….…….…….……

Address (location) of the equipment:

…….…….…….…….

Content of the meeting with the user:

- Representative: (information)
- Witness:

2- Basic specifications

- Code:	……	- Slewing speed:	……	rpm
- Production number:	……	- Crane travel speed (for mobile equipment):	……	m/min
- Production year:	……	- Radius (max):	……	m
- Manufacturer:	……	- Lifting height of (main and auxiliary) hooks:	……	m
- Design load(max)	……tonnes	- Load at the maximum radius:	……	tonnes
- Lifting speed:	……m/min	- Uses:	……	

3- Document inspection:

- Machine profile:
- Technical documents:

4- Code of measuring and testing equipment:

5- Equipment inspection:

a. External inspection:

- Metal structure
- Hook and pulley assembly:…
- Wire ropes and wire rope fixation:…
- Hydraulic cylinders and pistons:…
- Brakes:….
- Counterweight:….
- Safety devices:

b. Technical inspection:

- 125% load test:(10-minute hold)
- Brakes: ……
- Metal structure:….
- 110% dynamic test:

- Brakes (load holding)
- Mechanisms and parts:
- Metal structure:

6- Inspection of limiters, load indicator, overload indicator.

7. Processing and evaluation of inspection results.

8- Recommendations: (if any).

WITNESS	**INSPECTOR**
(Signature and full name)	*(Signature and full name)*

Appendix 02

SPECIMEN OF **RECORD ON INSPECTION OF TECHNICAL SAFETY (FOR MOBILE CRANES)**

(Name of inspecting organization)	**THE SOCIALIST REPUBLIC OF VIETNAM**
-------	**Independence - Freedom - Happiness**

…… [place], ……[date]

TECHNICAL SAFETY INSPECTION RECORD (FOR MOBILE CRANES)

No. …….

We are:

1. ……..…… Inspector number:

……..……

2. ……..…… Inspector number:

……..……

Inspecting organization:

……..……..……..……

Registration certificate No. ……..……

Name of the inspected equipment:……. ……

Name of the user: ……..……..……..…….

Address (head office of the user): ……..……..……..……

Address (location) of the equipment:

……..……..……..……. ……

Inspection procedure and standards applied: ……

Individuals witnessing and approving the record:……..…… ……

1…… Position:……..……

2…… …… Position:……

I- BASIC SPECIFICATIONS

- Code:	……	- Slewing speed:	……	rpm
- Production number:	……	- Crane travel speed (for mobile equipment):	……	m/min
- Production year:	……	- Actual/design radius:	……	m
- Manufacturer:	……	- Actual/design lifting height of (main and auxiliary) hooks:	……	m
- Design load(max)	……tonnes	- Load at the maximum actual/design radius:	……	tonnes
- Lifting speed:	……m/min	- Uses:	……	

II- FORMS OF INSPECTION

First time □ ; Periodic □ ; Unscheduled □

III- INSPECTION CONTENT

A. Document inspection:

No.	Item	Passed	Failed	Note
1	Profile			

No.	Item	
2	License plate	……..

B. External inspection; no-load test:

No.	Mechanisms; parts	Passed	Failed	Note
1	Main hook/auxiliary hook			
2	Pulley assembly			
3	Main hoist rope			
4	Auxiliary hoist rope			
5	Tie rod			
6	Boom hoist rope			
7	Main hoisting mechanism			
8	Wind speed meter			

No.	Mechanisms; parts	Passed	Failed	Note
15	Auxiliary hoisting mechanism			
16	Boom hoisting mechanism			
17	Telescoping mechanism			
18	Leg (Chain)			
19	Whistle/bell			
20	Metal structure, boom			
21	Crane frame			
22	Auxiliary hoist brake			

9	Height limiter				23	Boom hoist brake			
10	Boom angle limiter				24	Radius and corresponding load indicator			
11	Counterweight				25	Control system			
12	Travel mechanism				26	Hydraulic system			
13	Main hoist brake				27	Slewing mechanism			
14	Travel brake				28	Slewing mechanism brake			

C-Load test:

No.	Load holding position and test result	Passed	Failed	Radius (m)	Corresponding load (tonnes)	Static test load (tonnes)	Dynamic test load (tonnes)
1	Minimum radius			R=			
2	Maximum radius			R=			
3	Auxiliary boom						
4	Main boom length						
5	Stability						

No.	Result evaluation	Passed	Failed	Note	No.	Result evaluation	Passed	Failed	Note
1	Metal structure				6	Slewing mechanism brake			
2	Load hoist brake				7	Travel brake			
3	Boom hoist brake				8	Leg (Chain)			

4	Overload limiter (if any)				9	Hydraulic system				
5	Load hoist rope				10	Control system				

IV - CONCLUSIONS AND RECOMMENDATIONS

1. Result: Passed □ Failed □

2. Inspection stamp No:…… At:……

3. Maximum load: ..... tonnes, corresponding to radius:…. m.

4. Recommendations:……..

Deadline for implementation of recommendations:……..

V - INSPECTION INTERVAL

Date of next inspection:

Reasons for shortened interval (if any):

The record is approved on:

At:……..…….……..……

The record is made into of ……copies, each party holds…. copies./.

We, the inspectors who inspect the equipment are responsible for the accuracy of the comments on and evaluation of the inspection results specified in this record./.

EQUIPMENT USER	WITNESS	INSPECTOR
Undertaking to fulfill recommendations in sufficient and timely manner (signature and seal)	*(signature and full name)*	*(signature and full name)*

PROCEDURES FOR TECHNICAL INSPECTION OF SAFETY OF LIFTING TABLES

QTKD: 11- 2016/BLDTBXH

Foreword

Procedures for inspection of technical safety of lifting tables are drafted by the Department of Work Safety and promulgated together with the Circular No. 54/2016/TT-BLDTBXH dated December 28, 2016 of the Ministry of Labour, Invalids and Social Affairs.

PROCEDURES FOR TECHNICAL INSPECTION OF SAFETY OF LIFTING TABLES

1. SCOPE AND REGULATED ENTITIES

1.1. Scope

Such procedures shall be used for first, periodic and unscheduled inspection of lifting tables (including: lifting tables, lifting platforms and lifting bridges used to lift goods) under state management of the Ministry of Labour, Invalids and Social Affairs.

Such procedures shall not apply to the lifting tables placed on floating work platforms.

1.2. Regulated entities

- Organizations carrying out occupational safety inspection;

- Occupational safety inspectors.

2. NORMATIVE REFERENCES

- TCVN 4244:2005, Lifting appliances - Design, construction and survey.

- TCVN 5209:1990, Loading crane - Safety requirements for electrical equipment.

- TCVN 4755:1989, Cranes - Safety requirements for hydraulic equipment.

- TCVN 5179:90, Hoisting cranes - Test requirements of hydraulic equipment for safety.

- TCVN 9358 : 2012 Installation of equipment earthing system for industrial projects - General requirements.

- QCVN 22:2010/BGTVT, National technical regulation on construction and survey of lifting appliances;

- BSEN 1570:1998+A2: 2009 - Safe requirements for lifting table.

In the cases where the abovementioned normative references are amended or replaced, regulations of the latest references shall apply.

Other standards may be applied to lifting tables at the request of their user or manufacturer if such standards contain the same or higher safety criteria than those in the national standards referred to in this document.

3. TERMS AND DEFINITIONS

For the purposes of this document, the terms and definitions given in the abovementioned normative references and the following shall apply:

3.1. “lifting table” means a lifting device used to raise and/or lower goods. A lifting table includes such main mechanisms and parts as platform surface, base frame, lifting frame system (X-shaped type with one or more layers, cylinder type or fork type, etc.), drive system (hydraulic, mechanical, etc.).

3.2. “first safety inspection” means the inspection of technical safety of equipment according to national technical standards and technical safety standards after its installation and before its first use.

3.3. “periodic safety inspection” means the inspection of technical safety of equipment according to national technical standards and technical safety standards after expiration of the last safety inspection result.

3.4. “unscheduled safety inspection” means the inspection of technical safety of equipment according to national technical standards and technical safety standards and will be carried out:

- after a repair, upgrade or renovation that affects the safety of equipment;

- after change of the location of installation;

- at the request of the user or a competent authority.

4. INSPECTION STEPS

Safety inspection shall be carried out in the following order:

- Inspection of the equipment profile/documents;

- External inspection;
- Technical inspection - No-load test;
- Load test - Test methods;
- Inspection result processing.

Note: Only take the next step if the equipment passes the test in the previous step. The result of each step shall be documented according to the form in the Appendix 01 and retained by the inspecting organization.

5. INSPECTION EQUIPMENT

Inspection equipment shall be inspected and calibrated in accordance with regulations. Inspection equipment includes:

- Theodolite (if necessary);
- Automatic level;
- Altimeter (speedometer);
- Distance measuring equipment;
- Geometric inspection equipment;
- Dynamometer or hanging scale;
- Insulation resistance meter;
- Ground resistance meter;
- Multimeter;
- Clamp meter;

6. CONDITIONS FOR INSPECTION

The inspection must not be carried out unless the following conditions are met:

6.1. The equipment is at the ready for inspection.

6.2. Documents about the equipment are adequate.

6.3. The inspection is not affected by environment or weather.

6.4. Requirements concerning occupational safety and health are met.

7. PREPARATION FOR INSPECTION

7.1. Before carrying out the inspection, the inspecting organization and the user shall reach an agreement on an inspection plan and prepare for the inspection and assign staff to participate in and witness the inspection.

7.2. Inspect the equipment profile and documents. The following documents shall be inspected according to inspection regulations:

7.2.1. Regarding first inspection:

- The profile of a lifting table must specify the type and code; production number; production year; manufacturer; drive type; control type; lifting speed; travel speed (if any) and main technical characteristics of parts;

+ Drawings specifying main dimensions;
+ Transmission principle diagram;
+ Guidelines for operation and maintenance.
+ Factory acceptance test results (if any).

- Reports on results of and records on inspection of insulation grounding and resistance of the motor.

- Certificate of conformity issued by the designated organization as prescribed.

7.2.2. Regarding periodic inspection:

- The previous profile, inspection record and inspection result report;

- Documents on the use, operation and maintenance of the equipment; inspection record (if any).

7.2.3. Regarding unscheduled inspection:

- In case of renovation or repair: documents on renovation or repair and commissioning record;

- In case of relocation: installation documents;

- The inspection record issued by competent authority (if any).

The document inspection result is satisfactory if the documents are adequate and the regulations in 7.2 are observed. If the result is unsatisfactory, the user shall take remedial actions.

7.3. Prepare suitable and adequate equipment for inspection.

7.4. Develop measures for ensuring safety and reach an agreement with the user before inspection. Provide adequate personal protective equipment to ensure safety during the inspection.

8. INSPECTION PROCESS

An inspection shall be carried out in the following order:

8.1. External inspection:

8.1.1. Check the installation location of equipment, electrical system, instruction manual, protective fences, ground, distance and safety measures, notable obstacles during inspection.

8.1.2. Check the conformity of parts and technical specifications of the equipment with those specified in the documents/profile.

8.1.3. Check all mechanisms or parts of the lifting equipment individually, pay particular attention to the condition of the following parts:

- Metal structure of the lifting frame and platform surface (Appendix 17 of TCVN 4244 : 2005).

- Welds, riveted joints (if any), bolted joints of the connection structure.

- Rope fixing parts (meeting the manufacturer's requirements or referring to Appendices 18C and 21 of TCVN 4244: 2005).

- Pulleys, shafts and fixing parts (Appendices 19A, 20A and 20B of TCVN 4244: 2005).

- Check the results of measurement of grounding resistance and insulation resistance.

- Hydraulic system:

+ Check the technical condition of the hydraulic cylinder: no deformation, no hydraulic oil leak.

+ Check the technical condition of the hydraulic oil pipeline system and connectors: not flattened, cracked, leak-proof and firmly fixed.

- Check the control system: location of installation, priority, homogeneity between mechanism and control mode.

- Safety devices: Safety valve, relief valve, lifting and lowering limiter, overload limiter, mechanical braking mechanism, etc.

- Rails, anti-slip, anti-roll and anti-fall devices (according to the manufacturer's design).

The equipment passes the test if it is installed according to the technical documents, no damage or defect is found and the requirements in section 8.1 are met.

8.2. Technical inspection - No-load test:

Let the equipment to operate without load and check the operation of systems and structures:

- Check the operating status of the work platform hoisting and lowering mechanisms.

- Hydraulic system: inspected and assessed according to TCVN 5179:1990.

- Drive system and control system of the equipment.

- Brake system.

- Safety devices.

- Conduct the abovementioned tests at least 03 (three) times.

The equipment passes the test if its mechanisms and safety devices operate according to their specifications and design and no damage is found.

8.3. Load test - Test methods:

8.3.1. Static test:

Only conduct a static test if the equipment fails the no-load test.

- Test load: 125% of SWL (the safe working load must not be greater than the design load)

- The platform height during load test: ≤ 200 mm from the lowest lowering position of the work platform (in the position where the mechanical braking mechanism has not yet acted).

- Arrange a load test on the platform surface:

+ Stacking load is evenly distributed over the actual working surface area of the platform.

+ For a lifting table designed to lift a specific type of load, the test load is arranged at the same positions as in the working process.

- Run the load test for 10 minutes

The equipment passes the static load test if its metal structure shows no crack or permanent deformation; the lifting platform does not drift; the equipment remains stable; shows no sign of oil leak.

8.3.2. Dynamic test:

- Test load: at 110% of SWL.

- Conduct the test throughout operation of the equipment.

- Conduct abovementioned test at least 03 times.

The equipment passes the static load test if its mechanisms and parts operate according to the design; its metal structure shows no crack or permanent deformation; the lifting platform does not drift; the equipment remains stable; shows no sign of oil leakage; shows no damage.

8.3.3. Other requirements:

- If the equipment has multiple hoisting mechanisms, the static and dynamic tests shall be carried out for each hoisting mechanism with the corresponding working load.

- If the equipment has a platform that can be tilted at an angle, conduct static and dynamic tests on the work platform tilting mechanism and the friction between the work platform and the working load shall be checked.

9. INSPECTION RESULT PROCESSING

9.1. Prepare an inspection record which contains sufficient information according to the form in the Appendix 02 enclosed herewith.

9.2. Approve the inspection record:

Mandatory participants in the process of approving the inspection record:

- The representative of the user or a person authorized by the user;

- A witness;

- The inspectors.

When the record is approved, the inspector, the witness, and the representative of the user or a person authorized by the user shall append their signatures and seals (if any) on the record. The record shall be made into two (02) copies, each party shall keep 01.

9.3. Write the brief inspection result to the profile of the lifting table (including full names of the inspectors and the date of inspection).

9.4. Put on the inspection stamp: if the lifting table passes the test, the inspector shall put an inspection stamp on it at a noticeable position.

9.5. Issuance of certificate of inspection results:

9.5.1. If the lifting table passes the test, the inspecting organization shall issue the certificate of inspection result to the equipment within 05 working days from the date on which the inspection record is approved.

9.5.2. If the lifting table fails the test, only the steps in 9.1 and 9.2 shall be taken and the inspection record must specify the explanation for failed result, necessary remedial actions and a deadline for taking such actions. The inspection record shall be sent to the employment authority of the area where the lifting table is installed and located.

10. INSPECTION INTERVAL

10.1. A lifting table has to be inspected at least every 02 years. For the lifting table that has been used for more than 10 years, it has to be inspected every year.

10.2. In the case where a shorter interval is demanded by the manufacturer or user, such interval shall apply.

10.3. If the inspection interval is shortened, the inspector shall specify explanation in the inspection record.

10.4. If the inspection interval is specified in national technical regulations, such regulations shall apply.

Appendix 01

SPECIMEN OF **ON-SITE RECORD**
(TECHNICAL INSPECTION OF SAFETY OF LIFTING TABLES)

(Name of inspecting organization)	**THE SOCIALIST REPUBLIC OF VIETNAM**
-------	**Independence - Freedom - Happiness**

…… [place], ……[date]

ON-SITE RECORD

No. .....

(written by the inspector)

1- General information

Name of the equipment:

…….…….…….…….

Name of the user: …….…….…….…….

Address (head office of the user):

…….…….…….……

Address (location) of the equipment:

…….…….…….…….

Content of the meeting with the user:

- Representative: (information)
- Witness:

2. Basic specifications

- Code:	- Design/actual lifting height: ……..... m
- Production number:	- Lifting speed: …….…….. m/min
- Production year:	- Dimension of lifting table: …….….m
- Manufacturer:	- Uses: .....

- Design load:..... tonnes

3- Document inspection:

- Machine profile:
- Technical documents:

4- Code of measuring and testing equipment:

5- Equipment inspection:

a. External inspection:

+ Metal structure of lifting table and frame::..
+ Connection between frame and fixed base:..
+ Wire ropes and wire rope fixation, pulleys:…
+ Protective grounding:…

+ Hydraulic system:…

+ Rails, safety fences…

+ Travel mechanism:…

+ Brakes:….

+ Safety devices, mechanical braking mechanism:…

b. Technical inspection:

- Load test at 125%: (10-minute hold)

+ Brakes: ……

+ Metal structure:….

- Dynamic load test at 110%:

+ Brakes:…

+ Mechanisms and parts:

+ Metal structure:

6- Inspection of limiters, overload limiter (if any).

7. Processing and evaluation of inspection results.

8- Recommendations: (if any)

WITNESS	**INSPECTOR**
(Signature and full name)	*(signature and full name)*

Appendix 02

(SPECIMEN OF RECORD ON INSPECTION OF TECHNICAL SAFETY OF LIFTING TABLE)

(Name of inspecting organization)	**THE SOCIALIST REPUBLIC OF VIETNAM**
-------	**Independence - Freedom - Happiness**

…….. [place], ……[date]

RECORD ON TECHNICAL INSPECTION OF SAFETY OF LIFTING TABLE

No. …….

(According to the on-site record No. ……..)

We are:

1. ……..…… Inspector number:

……..……

2. ……..…… Inspector number:

……..……

Inspecting organization:

……..……..……..……

Registration certificate No. ……..……

Name of the inspected equipment:……. ……

Name of the user: …….…….…….…….

Address (head office of the user): …….…….…….……

Address (location) of the equipment:

…….…….…….…….

Inspection procedure and standards applied: ……

Individuals witnessing and approving the record:…….…… ……

1…… Position:…….……

2…… Position:…….……

I- BASIC SPECIFICATIONS

- Code: ..... - Design/actual lifting height: ……..... m
- Production number: ..... - Lifting speed: …….…….. m/min
- Production year: ..... - Dimension of lifting table: …….….m
- Manufacturer: ..... - Uses: .....
- Design load:..... tonnes

II- FORMS OF INSPECTION

First time □ ; Periodic □ ; Unscheduled □

Reason for unscheduled inspection: …….……

III- INSPECTION CONTENT:

A-Technical document inspection:

- Comments: …….....
- Result evaluation:

No.	Item	Passed	Failed	Note
1	Profile			

B- External inspection; no-load test:

- Comments: ……...
- Result evaluation:

No.	Mechanisms; parts	Passed	Failed	Note
1	Lifting table (lifting platform, lifting boom)			
2	Metal structure			

No.	Mechanisms; parts	Passed	Failed	Note
9	Rope pulley (chain)			
10	Load wire rope (load			

	of lifting frame and post					chain)				
3	Hydraulic system				11	Hoisting mechanism brake, hydraulic brake valve assembly				
4	Cylinder and piston of hoisting and lowering mechanism				12	Connection between post body and factory floor				
5	Nuts and screws of hoisting and lowering mechanism				13	Electrical system				
6	Hoisting and lowering limiter				14	Control system				
7	Safety devices				15	Rails, safety fences				
8	Mechanical braking mechanism									

C-Load test:

- Comments: ……...

- Result evaluation:

No.	Load holding position and test result	Passed	Failed	Working load	Static load test	Dynamic load test	
1	Lifting table, lifting platform						
2	Stability						

No.	Result evaluation	Passed	Failed	Note	No.	Result evaluation	Passed	Failed	Note
1	Lifting table (lifting platform, lifting boom)				5	Mechanical braking mechanism			
2	Metal structure of lifting frame				6	Electrical			

	and post					system				
3	Hydraulic system				7	Control system				
4	Load hoisting and lowering mechanism				8	Safety devices				

IV- CONCLUSIONS AND RECOMMENDATIONS

1. Result: Passed □ Failed □

Maximum load: ..... tonnes.

2. Inspection stamp No. …… At:……

3. Recommendations: ……..

Deadline for implementation of recommendations: ……..

V - INSPECTION INTERVAL

Date of next inspection:

Reasons for shortened interval (if any):

The record is approved on:

At:……

The record is made into of ……copies, each party holds…. copies./.

EQUIPMENT USER	**WITNESS**	**INSPECTOR**
(Full name and signature) (Undertaking to fulfill recommendations in sufficient and timely manner)	*(Signature and full name)*	*(Signature and full name)*

PROCEDURES FOR TECHNICAL INSPECTION OF SAFETY OF SUSPENDED WORKING PLATFORMS

QTKD: 12 - 2016/BLDTBXH

Foreword

Procedures for inspection of technical safety of suspended working platforms are drafted by the Department of Work Safety and promulgated together with the Circular No. 54/2016/TT-BLDTBXH dated December 28, 2016 of the Ministry of Labour, Invalids and Social Affairs.

PROCEDURES FOR TECHNICAL INSPECTION OF SAFETY OF SUSPENDED WORKING PLATFORMS

1. SCOPE AND REGULATED ENTITIES

1.1. Scope

Such procedures shall be used for first, periodic and unscheduled inspection of suspended working platforms under state management of the Ministry of Labour, Invalids and Social Affairs.

1.2. Regulated entities

- Organizations carrying out occupational safety inspection;

- Occupational safety inspectors.

2. NORMATIVE REFERENCES

- QCVN 07: 2012/BLDTBXH, National technical regulation on safe work of lift appliances;

- QCVN 20: 2015/BLDTBXH, National technical regulation on safe work of Elevating Platform for lifting people;

- TCVN 4244:2005 - Lifting appliances - Design construction and survey;

- China National Standard GB 19155:2003 - Aerial work platform;

- China National Standard GB/T 5972-2006/ISO 4309:1990: Cranes - Wire ropes - Code of practice for examination and discard;

- Code of Practice for Safe Use and Operation of Suspended Working Platforms of Hong Kong - China.

In the cases where the abovementioned normative references are amended or replaced, regulations of the latest references shall apply.

Other standards may be applied to suspended working platforms at the request of their user or manufacturer if such standards contain the same or higher safety criteria than those in the national standards referred to in this document.

3. TERMS AND DEFINITIONS

For the purposes of this document, the terms and definitions given in the abovementioned normative references and the following shall apply:

3.1. “suspended working platform” means a structure consisting of a working platform, suspension beam assembly, winch assembly, counterweights, wire ropes and other safety mechanisms and components to provide a working space for people and tools when working at height. It is commonly known as gondola.

3.2. “first safety inspection” means the inspection of technical safety of equipment according to national technical standards and technical safety standards after its installation and before its first use.

3.3. “periodic safety inspection” means the inspection of technical safety of equipment according to national technical standards and technical safety standards after expiration of the last safety inspection result.

3.4. “unscheduled safety inspection” means the inspection of technical safety of equipment according to national technical standards and technical safety standards and will be carried out:

- after a repair, upgrade or renovation that affects the safety of equipment;

- after change of the location of installation or after its main assemblies are dismantled;

- at the request of the user or a competent authority.

4. INSPECTION STEPS

Safety inspection shall be carried out in the following order:

- Inspection of the equipment profile/documents;
- External inspection;
- Technical inspection - No-load test;
- Load test - Test methods;
- Inspection result processing.

Note: Only take the next step if the equipment passes the test in the previous step. The result of each step shall be documented according to the form in the Appendix 01 and retained by the inspecting organization.

5. INSPECTION EQUIPMENT

Inspection equipment shall be inspected and calibrated in accordance with regulations. Inspection equipment includes:

- Theodolite (if necessary);
- Altimeter (speedometer);
- Distance measuring equipment;
- Geometric inspection equipment;
- Dynamometer or hanging scale (if necessary);
- Insulation resistance meter;
- Ground resistance meter;
- Multimeter;
- Clamp meter;

6. CONDITIONS FOR INSPECTION

The inspection must not be carried out unless the following conditions are met:

6.1. The equipment is at the ready for inspection.

6.2. Documents about the equipment are adequate.

6.3. The inspection is not affected by environment or weather.

6.4. Requirements concerning occupational safety and health are met.

7. PREPARATION FOR INSPECTION

7.1. Before carrying out the inspection, the inspecting organization and the user shall reach an agreement on an inspection plan and prepare for the inspection and assign staff to participate in and witness the inspection.

7.2. Inspect the equipment profile and documents. The following documents shall be inspected according to inspection regulations:

7.2.1. Regarding first inspection:

7.2.1.1. Equipment profile and documents;

- The profile must specify the code, place of production, year of production, permissible load, travel capacity, operating principle, drive and control type, speed, counterweight, main dimensions (work platform, suspension beams) and main technical characteristics of the system (control devices, necessary safety devices, overload limiter).

- Technical documents, including operating principle diagram, layout of installation of structural assemblies, general drawings containing main dimensions and specifications and technical characteristics.

- Documents on technical management, operation, maintenance and inspection.

- Guidelines for installation, operation and emergency response.

- Certificate of conformity issued by the designated organization as prescribed.

7.2.1.2. Installation documents:

- Location of installation, safety dimensions.

- As-built drawing, technical acceptance records.

- Results of inspection of insulation grounding and resistance of the motor (if any).

7.2.2. Regarding periodic inspection:

- The previous profile and inspection result.

7.2.2.2. Documents on the use, operation and maintenance of the equipment; inspection record (if any).

7.2.3. Regarding unscheduled inspection:

- Document on innovation or repair.

- Post-renovation or post-repair commissioning record, test results.

- The inspection record issued by competent authority.

The document inspection result is satisfactory if the documents are adequate and the regulations in 7.2.1, 7.2.2 and 7.2.3 are observed. If the result is unsatisfactory, the user shall take remedial actions.

7.3. Prepare suitable and adequate equipment for inspection.

7.4. Develop measures for ensuring safety and reach an agreement with the user before inspection. Provide adequate personal protective equipment to ensure safety during the inspection.

8. INSPECTION PROCESS

An inspection shall be carried out in the following order:

8.1. External inspection:

- Check the location of equipment location: The ground where the equipment is placed must ensure the equipment’s bearing capacity. It is required to maintain a safe distance between the location of installation and the power transmission line (according to 1.5.7.1.9 of TCVN 4244:2005);

- Measure and check the erection dimensions of the suspended working platform: The erection must be carried out in a stable manner and according to the manufacturer's design.

- Check weather condition: there is no rain, the temperature does not exceed 40°C, the wind speed does not exceed 8.3 m/s.

- Check the adequacy and conformity of the parts, assemblies and technical specifications on the equipment with those specified in the equipment profile/documents and pay particular attention the technical condition of the following parts:

+ Metal structure of the work platform and suspension beam: inspected and assessed according to Appendix 6 of TCVN 4244:2005;

+ Bolted joints of the connections: carry out visual inspection of the assembly of the parts in accordance with the manufacturer's manual;

+ Check the welded connections: carry out visual inspection and discover external damage or defects;

+ Wire ropes: the type specified by the manufacturer. The outer diameter wear should be less than 10% of the rope diameter, the number of broken wires should not exceed 5% of the total number of wires in a length which is 10 times the rope diameter;

+ Fixation of the wire rope ends: follow the manufacturer's normative references or the standard method of attaching wire rope clips in the Appendix 18C of TCVN 4244:2005;

+ Check the turnbuckle for any deformation or defect in the body and head of the turnbuckle and evaluate them according to Appendix 15 of TCVN 4244:2005

+ Check the weight of the counterweight on the suspension beam and the fixed anchorage of the counterweight in the frame;

+ Check the installation of load and safety rope tensioning counterweights: it is required to be firmly fixed without slipping or according to the manufacturer's instructions;

+ Assemblies of hoisting and slewing mechanisms: metal structure of the mechanisms and installation thereof according to the manufacturer's manual;

+ Manual rescue means;

+ Safety locks: metal structure of the locks, fixing of the locks on the work platform;

+ Winch brake, emergency brake, overspeed governor;

+ Pulleys, shafts and pulley shaft fixings;

+ Tracks, wheels and drive components;

+ Safety devices: lifting and lowering limiter, overload limiter;

+ Electric cables, control panel: electrodynamic cables must conform to the manufacturer's type, the connectors in the control panel must be tightened and ensure electrical safety regulations;

+ Hydraulic system of boom hoisting mechanism: Detect hydraulic oil leaks from parts, check the installation of valve assemblies and pipelines.

The equipment passes the test if it is sufficiently installed according to the design, no damage or defect is found and the requirements in section 8.1 are met.

8.2. Technical inspection - No-load test:

- Check and assess the insulation resistance of the dynamic electric circuit by the voltage level. To be specific:

Rated voltage (V)	Test voltage (V)	Insulation voltage (MΩ)
≤250	250	≥0,25
≤500	500	≥0,5
>500	1000	≥1,0

- Conduct abovementioned test at least 03 (three) times.

- Determine specifications of the equipment motor: speed, motor current and compare them with those specified in the equipment documents.

- The equipment passes the no-load load test if its mechanisms, parts and safety devices operate according to the manufacturer's design.

The equipment passes the test if its dimensions, safety devices and mechanisms operate according to the manufacturer's design and the requirements in 8.2 are satisfied.

- Dimensions, safety devices and mechanisms operating according to the design.

8.3. Load test:

8.3.1. Static load:

Only conduct a static test if the equipment fails the no-load test.

The test load is 150% of the working load:

- Arrange test load on the work platform: the test load is evenly distributed on the work platform.

- Lifting height: from 100 to 200 mm from the foot of the work platform support to the ground.

- Run the load test for 10 minutes.

The equipment passes the test if the work platform does not drift, the equipment remains stable and its metal structure show no crack or deformation.

8.3.2. Dynamic load test:

The test load is 125% of the working load, let the suspended working platform operate in both up and down directions.

8.3.2.1. Test the entire operation of the hoisting and lowering mechanism.

- Let the suspended working platform operate in both up and down directions at least 03 times.

The equipment passes the test if its mechanisms operate according to its design, there is no abnormal function and the brake does not drift.

8.3.2.2. Test the safety locking mechanism:

Connect the external controller to the control panel, check the operation of the safety lock at 125% of the working load.

The equipment passes the test if it is only suspended on the safety wire rope with a work platform incline of less than 25% or within the limits specified by the manufacturer.

8.3.2.3. Test the overspeed governor (if any): if the suspended working platform is equipped with an overspeed governor, check the operation of overspeed governor. Let the loaded work platform operate in the down direction, impose force on the speed governor and check the holding of the work platform.

The equipment passes the test if the work platform does not drift.

9. INSPECTION RESULT PROCESSING

9.1. Prepare an inspection record which contains sufficient information according to the form in the Appendix 02 enclosed herewith.

9.2. Approve the inspection record:

Mandatory participants in the process of approving the inspection record:

- The representative of the user or a person authorized by the user;

- A witness;

- The inspectors.

When the record is approved, the inspector, the witness, and the representative of the user or a person authorized by the user shall append their signatures and seals (if any) on the record. The record shall be made into two (02) copies, each party shall keep 01.

9.3. Write the brief inspection result to the profile of the equipment (including full names of the inspectors and the date of inspection).

9.4. Put on the inspection stamp: if the equipment passes the test, the inspector shall put an inspection stamp on it at a noticeable position.

9.5. Issuance of certificate of inspection results:

9.5.1. If the equipment passes the test, the inspecting organization shall issue the certificate of inspection result to the equipment within 05 working days from the date on which the inspection record is approved.

9.5.2. If the equipment fails the test, only the steps in 9.1 and 9.2 shall be taken and the inspection record must specify the explanation for failed result, necessary remedial actions and a deadline for taking such actions. The inspection record shall be sent to the employment authority of the area where the equipment is installed and located.

10. INSPECTION INTERVAL

10.1. A suspended working platform has to be inspected every year. For the suspended working platform that has been used for more than 10 years, it has to be inspected every 06 months.

10.2. In the case where a shorter interval is demanded by the manufacturer or user, such interval shall apply.

10.3. If the inspection interval is shortened, the inspector shall specify explanation in the inspection record.

10.4. If the inspection interval is specified in national technical regulations, such regulations shall apply.

Appendix 01

SPECIMEN OF THE ON-SITE RECORD
(FOR SUSPENDED WORKING PLATFORM)

(Name of inspecting organization)	**THE SOCIALIST REPUBLIC OF VIETNAM**
-------	**Independence - Freedom - Happiness**

…….. [place], ……[date]

ON-SITE RECORD

No. .....

(written by the inspector)

1- General information

Name of the equipment:

…….

Name of the user: ……

Address (head office of the user):

……

Address (location) of the equipment:

……

Content of the meeting with the user:

- Representative: (information)

- Witness:

2- Basic specifications of the equipment: Motor: Motor capacity; production number; production year; safety lock: production number, manufacturer.

A- DOCUMENT INSPECTION:

……

B- EXTERNAL INSPECTION:

……

C- TECHNICAL INSPECTION - NO-LOAD TEST:

1-Installation:

- Dimensions of the suspension frame: (length, radius and distance)

- Counterweight: weight, counterweight fixing.

- Rope locks:

2. Measurement of parameters:

- Lifting and lowering speed

- Travel speed.

- Motor insulation.

- Ropes: diameter, condition.

D- LOAD TEST:

- At 150% of the working load:

(Structure, stability)

- At 125% of the working load:

(Brakes, safety locks, overspeed governor, etc.)

Recommendation(s) (if any):

WITNESS	**INSPECTOR**
(Signature and full name)	*(Signature and full name)*

Appendix 02

SPECIMEN OF RECORD ON TECHNICAL SAFETY INSPECTION (FOR SUSPENDED WORKING PLATFORM)

(Name of inspecting organization)	**THE SOCIALIST REPUBLIC OF VIETNAM** **Independence - Freedom - Happiness**

------ ----------

…….. [place], ……[date]

SPECIMEN OF RECORD ON TECHNICAL SAFETY INSPECTION
(FOR SUSPENDED WORKING PLATFORM)

No. …….

(According to the on-site record No. ……..)

We are:

1. ……..…… Inspector number: ……..……

2. ……..…… Inspector number: ……..……

Inspecting organization: ……..……..……..…….

Registration certificate No. ……..……

Name of the inspected equipment:……. ……

Name of the user: ……..……..……..…….

Address (head office of the user): ……..……..……..……

Address (location) of the equipment: ……..……..……..…….

Inspection procedure and standards applied: ……

Individuals witnessing and approving the record:……..…… ……..

1…… Position:……..……

2…… Position:……..……

I- BASIC SPECIFICATIONS

- Code: …… - Travel speed: ……m/min
- Production number: …… - Actual/design lifting height: …/… m
- Production year: …… - Dimensions of work platform:(DxRxC)……
- Manufacturer: …… - Suspension beam length: …….. m
- Design/working load: …/…….kg - Cantilever length: …….. m
- Design/working capacity:.../.... Persons - Counterweight: ……kg
- Work platform lifting speed: ……..…….. m/min - Uses: …….

II- FORMS OF INSPECTION

First time □ ; Periodic □ ; Unscheduled □

Reason for unscheduled inspection: ……..……

III - INSPECTION CONTENT

A- DOCUMENT INSPECTION:

No.	ITEM	PASSED	FAILED	NOTE
1	Profile			
2	Technical documents			

B- EXTERNAL INSPECTION:

- Adequacy of the equipment: ……

- Defects - deformations: ……..……

C- TECHNICAL INSPECTION - NO-LOAD TEST:

No.	Mechanism; part	Passed	Failed	Note	No.	Mechanism; part	Passed	Failed	Note
1	Work platform				10	Load hoist brake			
2	Metal structure of frame and boom				11	Slewing mechanism brake			
3	Load and boom hoisting mechanism				12	Travel mechanism brake			
4	Hydraulic system				13	Whistle/bell			
5	Load hoist rope				14	Electrical system			
6	Anti-fall wire rope				15	Control system			
7	Platform hoisting and lowering limiter				16	Anti-fall lock			
8	Travel mechanism				18	Overspeed governor			
9	Slewing mechanism				17	Counterweight			

D- Load test:

No.	Load holding position and test result	Passed	Failed	Working load (Qlv)	Static test (150% of Qlv)	Dynamic load (125% of Qlv)
1	Work platform					
2	Stability					

No.	Result evaluation	Passed	Failed	Note	No.	Result evaluation	Passed	Failed	Note
1	Work platform				5	Anti-fall lock			

2	Metal structure of lifting frame and boom				6	Control system				
3	Hydraulic system				7	Electrical system				
4	Load and boom hoisting mechanism				8	Overspeed governor				

IV - CONCLUSIONS AND RECOMMENDATIONS

1. Conclusion:

Result: Passed □ Failed □

- Maximum hoisting load on work platform: …..……. Kg.

- Maximum number of persons on work platform: ……..persons

2. Inspection stamp No. …… At:……

3.

Recommendations:…….....
....

Deadline for implementation of recommendations: …….....

V- INSPECTION INTERVAL

Date of next inspection: ..... /..... /20.....

Reasons for shortened interval (if any):

The record is approved at:.....on …

The record is made into of ……copies, each party holds…. copies./.

EQUIPMENT USER	**WITNESS**	**INSPECTOR**
Undertaking to fulfill recommendations in sufficient and timely manner (signature and seal)	*(Signature and full name)*	*(Signature and full name)*

PROCEDURES FOR INSPECTION OF TECHNICAL SAFETY OF CHAIN BLOCKS

QTKD: 13-2016/BLDTBXH

Foreword

Procedures for inspection of technical safety of chain blocks are drafted by the Department of Work Safety and promulgated together with the Circular No. 54/2016/TT-BLDTBXH dated December 28, 2016 of the Ministry of Labour, Invalids and Social Affairs.

PROCEDURES FOR INSPECTION OF TECHNICAL SAFETY OF CHAIN BLOCKS

1. SCOPE AND REGULATED ENTITIES

1.1. Scope

Such procedures shall be used for first, periodic and unscheduled inspection of chain blocks with a load capacity of 1,000kg or more under state management of the Ministry of Labour, Invalids and Social Affairs.

1.2. Regulated entities

- Organizations carrying out occupational safety inspection;
- Occupational safety inspectors.

2. NORMATIVE REFERENCES

- QCVN 7: 2012/BLDTBXH, National technical regulation on safe work of lift appliances;
- TCVN 4244:2005, Lifting appliances – Design construction and survey;
- TCVN 5207:1990, Loading crane - Safety requirements.

In the cases where the abovementioned normative references are amended or replaced, regulations of the latest references shall apply.

Other standards may be applied to chain blocks at the request of their user or manufacturer if such standards contain the same or higher safety criteria than those in the national standards referred to in this document.

3. TERMS AND DEFINITIONS

For the purposes of this document, the terms and definitions given in the abovementioned normative references and the following shall apply:

3.1. “chain block with a load capacity of 1,000kg or more” means a type of lifting equipment consisting of a hoisting and lowering mechanism, in many cases equipped with a travel mechanism, which is manually driven through a traction chain, speed reducer and chain hoist.

The chain block with a load capacity of 1,000kg is hereinafter referred to as “chain block”.

3.2. “first safety inspection” means the inspection of technical safety of equipment according to national technical standards and technical safety standards after its installation and before its first use.

3.3. “periodic safety inspection” means the inspection of technical safety of equipment according to national technical standards and technical safety standards after expiration of the last safety inspection result.

3.4. “unscheduled safety inspection” means the inspection of technical safety of equipment according to national technical standards and technical safety standards and will be carried out:

- after a repair, upgrade or renovation that affects the safety of equipment;
- After change of the location of installation (not applicable to the chain blocks which do not have a travel mechanism and are mobile);
- at the request of the user or a competent authority.

4. INSPECTION STEPS

Safety inspection shall be carried out in the following order:

- Inspection of the equipment profile/documents;
- External inspection;
- Technical inspection - No-load test;
- Load test - Test methods;

- Inspection result processing.

Note: Only take the next step if the equipment passes the test in the previous step. The result of each step shall be documented according to the form in the Appendix 01 and retained by the inspecting organization.

5. INSPECTION EQUIPMENT

Inspection equipment shall be inspected and calibrated in accordance with regulations. Inspection equipment includes:

- Distance measuring equipment;
- Geometric inspection equipment;
- Dynamometer or hanging scale;
- Theodolite (if necessary).

6. CONDITIONS FOR INSPECTION

The inspection must not be carried out unless the following conditions are met:

6.1. The equipment is at the ready for inspection.

6.2. Documents about the equipment are adequate.

6.3. The inspection is not affected by environment or weather.

6.4. Requirements concerning occupational safety and health are met.

7. PREPARATION FOR INSPECTION

7.1. Before carrying out the inspection, the inspecting organization and the user shall reach an agreement on an inspection plan and prepare for the inspection and assign staff to participate in and witness the inspection.

7.2. Inspect the equipment profile and documents. The following documents shall be inspected according to inspection regulations:

7.2.1. Regarding first inspection:

- Chain block profile/documents, especially the documents specified under QCVN 7:2012/BLDTBXH.
- Installation and release documents (for the chain block which does not have a travel mechanism and are mobile, it is not required to inspect the installation documents):

+ Calculation of strength of load-bearing structures and parts (if any);
+ Structural drawings which specify all main dimensions;
+ Technical specifications of hanging hook, crane hook and load chain of the chain block;
+ Factory acceptance record of the hoisting mechanism - chain block (if any);
+ Certificates of fabricated metal, weld metal and quality inspection of welds (according to 3.1.2 and 3.3.4 of TCVN 4244: 2005) of the load-bearing suspension system. For the chain block with attached travelling parts, there must be a track acceptance record;
+ Guidelines for operation and maintenance.

- Certificate of conformity issued by the designated organization as prescribed.

7.2.2. Regarding periodic inspection:

- The previous profile, inspection record and inspection result report;

- Documents on the use, operation and maintenance of the equipment; inspection record (if any).

7.2.3. Regarding unscheduled inspection:

- In case of renovation or repair: documents on renovation or repair and commissioning record;

- In case of relocation: installation documents;

- The inspection record issued by competent authority (if any).

The document inspection result is satisfactory if the regulations in 7.2 of this document are satisfied and the equipment's technical documents specified in QCVN 07:2012/BLDTBXH are complied with. If the result is unsatisfactory, the user shall take remedial actions.

7.3. Prepare suitable and adequate equipment for inspection.

7.4. Develop measures for ensuring safety and reach an agreement with the user before inspection. Provide adequate personal protective equipment to ensure safety during the inspection.

8. INSPECTION PROCESS

An inspection shall be carried out in the following order:

8.1. External inspection:

8.1.1. Check the installation location, electrical system, instruction manual, protective fences, ground, distance and safety measures, notable obstacles during inspection; conformity of parts and specifications of the equipment with those specified in the profile/documents.

8.1.2. Check all mechanisms or parts of the chain block individually, pay particular attention to the condition of the following parts:

- Metal structure of the equipment, bolted joints of the metal structure and location of hanging of the chain block;

- Hooks and parts of the hook assembly (Appendices 13A, 13B and 13C of TCVN 4244: 2005);

- Load chain, pull chain and rope fixing parts (meeting the manufacturer's requirements or referring to the Appendix 7 of TCVN 4244: 2005);

- Pulleys, shafts and parts used to fix the shaft sleeves (Appendices 19A, 20A and 20B of TCVN 4244: 2005);

- Brakes and parking pawls: inspected according to 1.5.3.3 of TCVN 4244:2005.

The equipment passes the test if it is installed according to the technical documents, no damage or defect is found and the requirements in section 8.1 are met.

8.2. Technical inspection - No-load test:

- Conduct no-load tests of structures and equipment, including all structures, safety devices, parking pawls and other equipment;

- Conduct the abovementioned tests at least 03 (three) times.

The equipment passes the test if its mechanisms and safety devices operate according to their specifications and design.

8.3. Load test - Test methods:

For the chain block fixed on load-bearing structures (such as crane girders, fixed suspension girders, etc.) the load test is the same as that of normal lifting equipment. To be specific:

8.3.1. Static test

Test load: at 125% of Q(tk) or 125% of Q(sd), where:

- Q(tk) is the design load;

- Q(sd): the load is required by the user (it must not be greater than the design load) and depends on the actual quality of the equipment;

The equipment passes the test if the load remains constant while it is being held for 10 (ten) minutes and after the load is lowered, the structures and parts of equipment have no crack, deformation or other damage (according to 4.3.2 of TCVN 4244-2005).

8.3.2. Dynamic test:

- Conduct a dynamic test according to 4.3.2 of TCVN 4244: 2005 at 110% of Q(tk) or 110% of Q(Sd), where:

+ Q(tk) is the design load;

+ Q(sd) is the load required by the user (not greater than the design load).

- Hoist and lower the load three times and check operation of other structures bearing such load.

The equipment passes the test if its structure and parts operate according to the design, the requirements specified by the applicable technical regulations are met and no crack, deformation or other damage is found.

If the chain block is dedicated to serving initial assembly and repair work (permanently installed in an irrigation pumping station, power plant's machine room, special machine assembly, etc.) and due to the ground, the load cannot be introduced for test or the chain block is mobile (removed from the load-bearing structure and transported elsewhere for use), specialized testing equipment may be used.

9. INSPECTION RESULT PROCESSING

9.1. Prepare an inspection record which contains sufficient information according to the form in the Appendix 02 enclosed herewith.

9.2. Approve the inspection record

Mandatory participants in the process of approving the inspection record:

- The representative of the user or a person authorized by the user;

- A witness;

- The inspectors.

When the record is approved, the inspector, the witness, and the representative of the user or a person authorized by the user shall append their signatures and seals (if any) on the record. The record shall be made into two (02) copies, each party shall keep 01.

9.3. Write the brief inspection result to the profile of the chain block (including full names of the inspectors and the date of inspection).

9.4. Put on the inspection stamp: if the equipment passes the test, the inspector shall put an inspection stamp on it at a noticeable position.

9.5. Issuance of certificate of inspection results:

9.5.1. If the equipment passes the test, the inspecting organization shall issue the certificate of inspection result to the equipment within 05 working days from the date on which the inspection record is approved.

9.5.2. If the equipment fails the test, only the steps in 9.1 and 9.2 shall be taken and the inspection record must specify the explanation for failed result, necessary remedial actions and a deadline for taking such actions. The inspection record shall be sent to the employment authority of the area where the equipment is installed and located.

10. INSPECTION INTERVAL

10.1. For a stationary chain block installed in a sheltered place, it has to be inspected every 3 years.

For a chain block that is permanently installed outdoor, is mobile or has been used for more than 12 years, it has to be inspected every year.

10.2. In the case where a shorter interval is demanded by the manufacturer or user, such interval shall apply.

10.3. If the inspection interval is shortened, the inspector shall specify explanation in the inspection record.

10.4. If the inspection interval is specified in national technical regulations, such regulations shall apply.

Appendix 01

SPECIMEN OF **ON-SITE RECORD**
(INSPECTION OF TECHNICAL SAFETY OF CHAIN BLOCK WITH LOAD CAPACITY OF 1,000 KG OR MORE)

(Name of inspecting organization)	**THE SOCIALIST REPUBLIC OF VIETNAM**
-------	**Independence - Freedom - Happiness**

	…… [place], ……[date]

ON-SITE RECORD

No. .....

(written by the inspector)

1- General information

Name of the equipment:

…….…….…….…….

Name of the user: …….…….…….…….

Address (head office of the user):

…….…….…….……

Address (location) of the equipment:

…….…….…….…….

Content of the meeting with the user:

- Representative: (information)

- Witness:

2- Basic specifications:

- Type, Code:..... - Design load:..... tonnes
- Production number: ..... - Load used: …….. tonnes
- Production year: ..... - Lifting speed: ..hand pulling....
- Manufacturer: ..... - Lifting height:..... m
- Uses: .....

3- Document inspection:

- Chain block profile:
- Technical documents:

4- Code of measuring and testing equipment:

5- Inspection process:

a. External inspection:

+ Metal structure:
+ Hook assembly:...
+ Travel mechanism (if any): ……
+ Chain and chain fixation:…
+ Brakes, parking pawls....
+ Safety devices (if any):

b. Technical inspection:

- 125% load test: (10-minute hold)

+ Brakes, parking pawls: …
+ Metal structure:….

- 110% dynamic test:

+ Brakes, parking pawls (load holding)
+ Mechanisms and parts:
+ Metal structure:

6- Processing and evaluation of inspection results.

7- Recommendations: (if any).

WITNESS	**INSPECTOR**
(Signature and full name)	*(Signature and full name)*

Appendix 02

SPECIMEN OF RECORD ON INSPECTION OF TECHNICAL SAFETY OF CHAIN BLOCK WITH LOAD CAPACITY OF 1,000 KG OR MORE

(Name of inspecting **THE SOCIALIST REPUBLIC OF VIETNAM**

organization) **Independence - Freedom - Happiness**

------- **----------**

…… [place], ……[date]

SPECIMEN OF RECORD ON INSPECTION OF TECHNICAL SAFETY OF CHAIN BLOCK WITH LOAD CAPACITY OF 1,000 KG OR MORE

No. …….

(According to the on-site record No. ……..)

We are:

1. ……. Inspector number:

……

2. ……. Inspector number:

……

Inspecting organization:

……

Registration certificate No. ……

Name of the inspected equipment:…….

……

Name of the user: ……

Address (head office of the user):

……

Address (location) of the equipment:

……

Inspection procedure and standards applied:

……

Individuals witnessing and approving the record:……

……..

1…… Position:……

2…… Position:……

I- BASIC SPECIFICATIONS

- Type and Code: ..... - Design load:..... tonnes
- Production number: ..... - Load used: …….. tonnes
- Production year: ..... - Lifting speed:.....hand pulling...
- Manufacturer: ..... - Lifting height:..... m
- Uses: .....

II- FORMS OF INSPECTION

First time □ Periodic □ Unscheduled □

Reason for unscheduled inspection: ……

III- INSPECTION CONTENT:

A-Technical document inspection:

No.	Item	Passed	Failed	Note
1	Equipment profile			

A. EXTERNAL INSPECTION, NO-LOAD TEST:

No.	**Mechanism; part**	**Passed**	**Failed**	**Note**
1	Hanging and hoisting hook			
2	Hook latch			
3	Chain wheel			
4	Hoisting chain			
5	Chain end fixture			
6	Slipping clutch			

No.	**Mechanism; part**	**Passed**	**Failed**	**Note**
7	Frame			
8	Brake			
9	Metal structure of girder			
10	Load hoisting mechanism			
11	Travel mechanism			
12	Travelling limiter			

B. LOAD TEST:

No.	Load holding position and test result	Passed	Failed	Corresponding load (tonnes)	Static test load (tonnes)	Dynamic test load (tonnes)
1.	In the middle of span					
2.	At the end of the cantilever					
3.	Stability					

No.	Result evaluation	Passed	Failed	Note
1.	Hanging and hoisting hook			
2.	Metal structure			
3.	Load hoisting mechanism			
4.	Hoisting chain			
5.	Load hoist brake			
6.	Parking pawl			

IV - CONCLUSIONS AND RECOMMENDATIONS

1. Result: Passed □ Failed □

Maximum load: ..... tonnes.

2. Inspection stamp No. …… At: ……..……

3. Recommendations: ……..……

Deadline for implementation of recommendations: …….....

V - INSPECTION INTERVAL

Date of next inspection:

Reasons for shortened interval (if any):

The record is approved on:

At:..……..……..……..……
…….

The record is made into of ……copies, each party holds…. copies./.

EQUIPMENT USER	**WITNESS**	**INSPECTOR**
(Full name and signature) (Undertaking to fulfill recommendations in sufficient and timely manner)	*(Signature and full name)*	*(Signature and full name)*

PROCEDURES FOR TECHNICAL INSPECTION OF SAFETY OF ELECTRIC HOISTS

QTKD: 14- 2016/BLDTBXH

Foreword

Procedures for inspection of technical safety of electric hoists are drafted by the Department of Work Safety and promulgated together with the Circular No. 54/2016/TT-BLDTBXH dated December 28, 2016 of the Ministry of Labour, Invalids and Social Affairs.

PROCEDURES FOR TECHNICAL INSPECTION OF SAFETY OF ELECTRIC HOISTS

1. SCOPE AND REGULATED ENTITIES

1.1. Scope

Such procedures shall be used for first, periodic and unscheduled inspection of electric hoists (hereinafter referred to as “equipment) under state management of the Ministry of Labour, Invalids and Social Affairs.

Such procedures do not apply to:

- Manual hoists, inclined and vertical shafts.

- Hoists with a load capacity of 10,000 N or more used in underground mining operations.

1.2. Regulated entities

- Organizations carrying out occupational safety inspection;
- Occupational safety inspectors.

2. NORMATIVE REFERENCES

- QCVN 7: 2012/BLDTBXH, National technical regulation on safe work of lift appliances.
- QCVN 01: 2011/BCT, National technical regulation on safety in underground coal mining;
- TCVN 4244:2005, Lifting appliances - Design construction and survey.
- TCVN 5206:1990, Loading crane - Safety requirements for counter - weight and ballast.
- TCVN 5207:1990, Loading crane - Safety requirements.
- TCVN 5209:1990, Loading crane - Safety requirements for electrical equipment.
- TCVN 5179:90, Hoisting cranes - Test requirements of hydraulic equipment for safety.
- TCVN 9358: 2012, Installation of equipment earthing system for industrial projects - General requirements.
- TCVN 9385:2012, Protection of structures against lightning - Guide for design, inspection and maintenance.
- TCVN 6780-2:2009, Safety requirements on underground mine of ore and non-ore exploitation - Part 2: Transport of mine.
- TCVN 6997: 2002, Mine hoist - Correction and verification.

In the cases where the abovementioned normative references are amended or replaced, regulations of the latest references shall apply.

Other standards may be applied to electric hoists at the request of their user or manufacturer if such standards contain the same or higher safety criteria than those in the national standards referred to in this document.

3. TERMS AND DEFINITIONS

For the purposes of this document, the terms and definitions given in the abovementioned normative references and the following shall apply:

3.1. “electric hoist” means a piece of electrically driven lifting equipment which is permanently installed and used to hoist loads, consisting of a mechanical transmission driven by a drum or a chain wheel.

3.2. “first safety inspection” means the inspection of technical safety of equipment according to national technical standards and technical safety standards after its installation and before its first use.

3.3. “periodic safety inspection” means the inspection of technical safety of equipment according to national technical standards and technical safety standards after expiration of the last safety inspection result.

3.4. “unscheduled safety inspection” means the inspection of technical safety of equipment according to national technical standards and technical safety standards and will be carried out:

- after a repair, upgrade or renovation that affects the safety of equipment;
- after change of the location of installation;
- at the request of the user or a competent authority.

4. INSPECTION STEPS

Safety inspection shall be carried out in the following order:

- Inspection of the equipment profile/documents;
- External inspection;
- Technical inspection - No-load test;
- Load test - Test methods;
- Inspection result processing.

Note: Only take the next step if the equipment passes the test in the previous step. The result of each step shall be documented according to the form in the Appendix 01 and retained by the inspecting organization.

5. INSPECTION EQUIPMENT

Inspection equipment shall be inspected and calibrated in accordance with regulations. Inspection equipment includes:

- Altimeter (speedometer);
- Distance measuring equipment;
- Geometric inspection equipment;
- Dynamometer or hanging scale;
- Insulation resistance meter;
- Ground resistance meter;
- Multimeter;
- Clamp meter.

6. CONDITIONS FOR INSPECTION

The inspection must not be carried out unless the following conditions are met:

6.1. The equipment is at the ready for inspection.

6.2. Documents about the equipment are adequate.

6.3. The inspection is not affected by environment or weather.

6.4. Requirements concerning occupational safety and health are met.

7. PREPARATION FOR INSPECTION

7.1. Before carrying out the inspection, the inspecting organization and the user shall reach an agreement on an inspection plan and prepare for the inspection and assign staff to participate in and witness the inspection.

7.2. Inspect the equipment profile and documents. The following documents shall be inspected according to inspection regulations:

7.2.1. Regarding first inspection:

- Equipment profile/documents, especially the following documents (under QCVN 7:2012/BLDTBXH):

+ Calculation of strength of load-bearing parts (if any);
+ Structural drawings which specify all main dimensions;
+ Guidelines for operation and maintenance.

- Equipment release documents:

+ Certificates of fabricated metal and weld metal (under 3.1.2 of TCVN 4244 : 2005);

+ Results of inspection of quality of weld joints (under 3.3.4 of TCVN 4244: 2005);

+ Factory acceptance record.

- Reports on results of and records on inspection of insulation grounding, lightning protection and resistance of the motor, protection devices (if any);

- Installation documents;

- Certificate of conformity issued by the designated organization as prescribed.

7.2.2. Regarding periodic inspection:

- The previous profile, inspection record and inspection result report;

- Documents on the use, operation and maintenance of the equipment; inspection record (if any).

7.2.3. Regarding unscheduled inspection:

- In case of renovation or repair: documents on renovation or repair and commissioning record;

- In case of relocation: installation documents;

- The inspection record issued by competent authority (if any).

The document inspection result is satisfactory if the documents are adequate and the regulations of QCVN 7:2012/BLDTBXH are observed. If the result is unsatisfactory, the user shall take remedial actions.

7.3. Prepare suitable and adequate equipment for inspection.

7.4. Develop measures for ensuring safety and reach an agreement with the user before inspection. Provide adequate personal protective equipment to ensure safety during the inspection.

8. INSPECTION PROCESS

An inspection shall be carried out in the following order:

8.1. External inspection:

8.1.1. Check the installation location, electrical system, instruction manual, protective fences, ground, distance and safety measures, notable obstacles during inspection; conformity of parts and specifications of the equipment with those specified in the profile/documents.

8.1.2. Check all mechanisms or parts of the lifting equipment individually, pay particular attention to the condition of the following parts:

Metal structure of the equipment, welds, riveted joints (if any), bolted joints of the metal structure, control room, ladder, platform and covers.

8.1.2.1. Load wire rope/chain:

8.1.2.1.1. Load wire rope:

- Type and diameter of the wire rope installed according to the equipment document;

- Wear and reduction in the cross section of the steel wire rope according to Articles 90-6a, b of QCVN 01: 2011/BCT and 6.3 of TCVN 6780-2: 2009;

- Number of broken wires per braid according to Article 90 6.b QCVN 01: 2011/BCT and 6.2.3 of TCVN 6780-2: 2009;

- Rust or other damage to wire rope according to Article 6.3.1 of TCVN 6780-2: 2009;

- Wire rope clamps. (meeting the manufacturer's requirements or referring to Appendices 18C and 21 of TCVN 4244: 2005 and Article 7.6 of TCVN 6780-2: 2009;

- Condition of wire rope on drum;

- Rope fixing parts (meeting the manufacturer's requirements or refer to Appendices 18C and 21 of TCVN 4244: 2005).

8.1.2.1.2. Chains and parts fixing chain ends: meeting the manufacturer’s requirements or referring to the Appendix 7 of TCVN 4244: 2005).

8.1.2.2. Hook connection mechanisms: according to Clause 1 Article 92 of QCVN 01:2011/BCT. Hooks and parts of hook assembly (Appendices 13A, 13B and 13C of TCVN 4244: 2005);

8.1.2.3. Pulleys supporting and redirecting wire rope, parts used to fixed the pulley shaft: inspected and assessed according to Article 82-12 of QCVN 01:2011/BCT; Appendices 19A, 20A and 20B of TCVN 4244: 2005.

8.1.2.4. Gearbox:

- Abnormal noise (according to Article 4.3.6 of TCVN 6997 - 2002);

- Surface temperature of the gearbox (according to Article 4.3.6 of TCVN 6997 - 2002), meeting the equipment manufacturer's criteria.

8.1.2.2. Electric motor, according to Article 99 of QCVN 01:2011/BCT.

8.1.2.6. Wire rope reels and attached equipment, according Articles 68 and 84 of QCVN 01: 2011/BCT; Clause 6 Article 7 of TCVN 6780-2: 2009.

8.1.2.7. Protective earthing and lightning protection system:

- Grounding resistance not exceeding exceed 4.0Ω, the electric motor’s insulation resistance not exceeding 0.5 MΩ (test voltage 500V);

- Equipment used in underground mines of ore and non-ore: total resistance of the grounded grid measured at any location of the grounded object is 2Ω at the maximum as prescribed in Clause 22 Article 102 of QCVN 01:2011/BCT;

- Result of measurement of the lightning protection system according to TCXDVN 9385:2012.

8.1.2.8. Coupling between the motor and the gearbox, between the gear box and the wire rope reel.

8.1.2.9. Working brakes:

- Installation and specifications;

- Thickness of the working brake pads;

- Clearance of the working brake pads according to Clause 3.1 Article 4 of TCVN 6997 - 2002;

- Brakes to be inspected according to 1.5.3.3 of TCVN 4244:2005.

The equipment passes the test if it is installed according to the technical documents, no damage or defect is found and the requirements in section 8.1 are met.

8.2. Technical inspection - No-load test:

- Conduct no-load tests of structures and equipment, including all structures, electrical equipment, safety devices, brakes, parking pawls, control equipment, lighting equipment, signals and sounds;

- Conduct the abovementioned tests at least 03 (three) times.

The equipment passes the test if its mechanisms and safety devices operate according to their specifications and design.

8.3. Load test - Test methods:

8.3.1. Static test:

- Conduct a static test at 125% (4.3.2 of TCVN 4244 : 2005) of the design load or the load required by the user (the load required by the user must be less than the design load) and depending on the actual quality of the equipment;

- Conduct the static test according to 4.3.2 of TCVN 4244: 2005.

The equipment passes the test if the load remains constant while it is being held for 10 (ten) minutes and after the load is lowered, the structures and parts of equipment have no crack, deformation or other damage (according to 4.3.2 of TCVN 4244-2005).

8.3.2. Dynamic test:

- Conduct a static test at 110% of the design load or the load required by the user (according to 4.3.2 of TCVN 4244: 2005), hoist and lower the load three times and inspect operation of other structures bearing such load;

- Conduct the dynamic load test according to the type of equipment and 4.3.2 of TCVN 4244: 2005.

The equipment passes the test if its structure and parts operate according to the design, the requirements specified by the applicable technical regulations are met and no crack, deformation or other damage is found.

The equipment passes the test if its structure and parts operate according to the design, the requirements specified by the applicable technical regulations on safety are met and no crack, residual strain or other damage is found.

9. INSPECTION RESULT PROCESSING

9.1. Prepare an inspection record which contains sufficient information according to the form in the Appendix 02 enclosed herewith.

9.2. Approve the inspection record:

Mandatory participants in the process of approving the inspection record:

- The representative of the user or a person authorized by the user;

- A witness;

- The inspectors.

When the record is approved, the inspector, the witness, and the representative of the user or a person authorized by the user shall append their signatures and seals (if any) on the record. The record shall be made into two (02) copies, each party shall keep 01.

9.3. Write the brief inspection result to the profile of the equipment (including full names of the inspectors and the date of inspection).

9.4. Put on the inspection stamp: if the equipment passes the test, the inspector shall put an inspection stamp on it at a noticeable position.

9.5. Issuance of certificate of inspection results:

9.5.1. If the equipment passes the test, the inspecting organization shall issue the certificate of inspection result to the equipment within 05 working days from the date on which the inspection record is approved.

9.5.2. If the equipment fails the test, only the steps in 9.1 and 9.2 shall be taken and the inspection record must specify the explanation for failed result, necessary remedial actions and a deadline for taking such actions. The inspection record shall be sent to the employment authority of the area where the equipment is installed and located.

10. INSPECTION INTERVAL

10.1. An electric hoist has to be inspected every 02 years. For the electric hoist that has been used for more than 12 years, it has to be inspected every year.

10.2. In the case where a shorter interval is demanded by the manufacturer or user, such interval shall apply.

10.3. If the inspection interval is shortened, the inspector shall specify explanation in the inspection record.

10.4. If the inspection interval is specified in national technical regulations, such regulations shall apply.

Appendix 01

SPECIMEN OF **ON-SITE RECORD**
(INSPECTION OF TECHNICAL SAFETY OF ELECTRIC HOISTS)

(Name of inspecting organization)	**THE SOCIALIST REPUBLIC OF VIETNAM**
-------	**Independence - Freedom - Happiness**

…… [place], ……[date]

ON-SITE RECORD

No. .....

(written by the inspector)

1- General information

Name of the equipment:

…….…….…….…….

Name of the user: …….…….…….…….

Address (head office of the user):

…….…….…….……

Address (location) of the equipment:

…….…….…….…….

Content of the meeting with the user:

- Representative: (information)

- Witness:

2- Basic specifications

- Code:	- Design load:..... tonnes
- Production number:	- Lifting speed: …….. m/min
- Production year:	- Lifting height of (main and auxiliary) hooks:..... m
- Manufacturer:	- Uses: .....

3- Document inspection:

- Machine profile:

- Technical documents:

4- Code of measuring and testing equipment:

5- Equipment inspection:

a. External inspection:

+ Metal structure

+ Hook and pulley assembly:…

+ Wire ropes and wire rope fixation:…

+ Protective grounding:…

+ Rail and rail fixation:

+ Brakes:…

+ Safety devices:

b. Technical inspection:

- 125% load test: (10-minute hold)

+ Brakes: ……

+ Metal structure:….

- Dynamic load test at 110%:

+ Brakes (load holding)

+ Mechanisms and parts:

+ Metal structure:

6- Inspection of limiters, load indicator, overload indicator.

7. Processing and evaluation of inspection results.

8- Recommendations: (if any).

WITNESS	**INSPECTOR**
(Signature and full name)	*(Signature and full name)*

Appendix 02

SPECIMEN OF RECORD ON INSPECTION OF TECHNICAL SAFETY OF ELECTRIC HOIST

(Name of inspecting organization)	**THE SOCIALIST REPUBLIC OF VIETNAM**
-------	**Independence - Freedom - Happiness**

…… [place], ……[date]

RECORD ON INSPECTION OF TECHNICAL SAFETY OF ELECTRIC HOIST

No. …….

(According to the on-site record No. ……..)

We are:

1. …… Inspector number:

……

2. …… Inspector number:

……

Inspecting organization:

……

Registration certificate No. ……

Name of the inspected equipment:…… ……

Name of the user: ……

Address (head office of the user): ……

Address (location) of the equipment:

……

Inspection procedure and standards applied: ……

Individuals witnessing and approving the record:…… ……

1…… Position:……

2…… Position:……

I- BASIC SPECIFICATIONS

- Code:	- Design load:..... tonnes
- Production number:	- Lifting speed: …….. m/minute
- Production year:	- Lifting height of (main and auxiliary) hooks:..... m
- Manufacturer:	- Uses: .....

II- FORMS OF INSPECTION

First time □ Periodic □ Unscheduled □

Reason for unscheduled inspection: ……

III- INSPECTION CONTENT:

A- Technical document inspection:

- Comments: ……...

- Result evaluation:

No.	Item	Passed	Failed	Note
1	Profile			

B- External inspection; no-load test:

- Comments: ……...

- Result evaluation:

No.	Mechanism; part	Passed	Failed	Note	No.	Mechanism; part	Passed	Failed	Note
1	Main hook/auxiliary hook				7	Main hoist mechanism			
2	Pulley assembly				8	Whistle (bell)			
3	Main hoist rope				9	Height limiter			
4	Main hoist brake				10	Electrical system			
5	Metal structure of main girder; connection with the building				11	Control system			
6	Crane frame								

C-Load test:

- Comments: ……...

- Result evaluation:

No.	Result evaluation	Passed	Failed	Corresponding load (tonnes)	Static test load (tonnes)	Dynamic test load (tonnes)
1	Load test					
2	Stability					

No.	Result evaluation	Passed	Failed	Note	No.	Result evaluation	Passed	Failed	Note
1	Metal structure				4	Load hoist rope			
2	Control system				5	Load hoist brake			
3	Overload limiter								

IV - CONCLUSIONS AND RECOMMENDATIONS

1. Result: Passed □ Failed □

Maximum load: ..... tonnes.

2. Inspection stamp No. …… At: ……..……

3. Recommendations: ……..……

Deadline for implementation of recommendations: …….....

V- INSPECTION INTERVAL

Date of next inspection:

Reasons for shortened interval (if any):

The record is approved on:

At:..……..……..……..……

The record is made into of .... copies, each party holds.... copies./.

EQUIPMENT USER	WITNESS	INSPECTOR
(Full name and signature) (Undertaking to fulfill recommendations in sufficient and timely manner)	*(Signature and full name)*	*(Signature and full name)*

PROCEDURES FOR INSPECTION OF TECHNICAL SAFETY OF ELECTRIC WINCHES FOR PULLING LOADS ON INCLINED PLANES

QTKD: 15- 2016/BLDTBXH

Foreword

Procedures for inspection of technical safety of electric winches for pulling loads on inclined planes are drafted by the Department of Work Safety and promulgated together with the Circular No. 54/2016/TT-BLDTBXH dated December 28, 2016 of the Ministry of Labour, Invalids and Social Affairs.

PROCEDURES FOR INSPECTION OF TECHNICAL SAFETY OF ELECTRIC WINCHES FOR PULLING LOADS ON INCLINED PLANES

1. SCOPE AND REGULATED ENTITIES

1.1. Scope

Such procedures shall be used for first, periodic and unscheduled inspection of electric winches for pulling loads on inclined planes (hereinafter referred to as “equipment) under state management of the Ministry of Labour, Invalids and Social Affairs. Such procedures may apply to other types of drive winches (mechanical, hydraulic, etc.) with the same features and purposes.

Such procedures do not apply to inclined shafts used in underground mining operations.

1.2. Regulated entities

- Organizations carrying out occupational safety inspection;

- Occupational safety inspectors.

2. NORMATIVE REFERENCES

- TCVN 4244:2005, Lifting appliances - Design construction and survey.

- TCVN 5206:1990, Loading crane - Safety requirements for counter - weight and ballast.

- TCVN 6780-2:2009, Safety requirements on underground mine of ore and non-ore exploitation;

- TCVN 5207:1990, Loading crane - Safety requirements.

- TCVN 5209:1990, Loading crane - Safety requirements for electrical equipment.

- TCVN 5179:90, Hoisting cranes - Test requirements of hydraulic equipment for safety.

- TCVN 9358: 2012, Installation of equipment earthing system for industrial projects - General requirements.

- TCVN 9385:2012, Protection of structures against lightning - Guide for design, inspection and maintenance.

- QCVN 7: 2012/BLDTBXH, National technical regulation on safe work of lift appliances;

- QCVN 01: 2011/BCT, National technical regulation on safety in underground coal mining.

In the cases where the abovementioned normative references are amended or replaced, regulations of the latest references shall apply.

Other standards may be applied to the equipment at the request of its user or manufacturer if such standards contain the same or higher safety criteria than those in the national standards referred to in this document.

3. TERMS AND DEFINITIONS

For the purposes of this document, the terms and definitions given in the abovementioned normative references and the following shall apply:

3.1. “electric winch for pulling a load on an inclined plane” means a piece of guided or non-guided lifting equipment used to hoist a load on an inclined plane, guided or non-guided. If non-guided, the winch should not directly pull the load as the load slides across the platform.

3.2. “first safety inspection” means the inspection of technical safety of equipment according to national technical standards and technical safety standards after its installation and before its first use.

3.3. “periodic safety inspection” means the inspection of technical safety of equipment according to national technical standards and technical safety standards after expiration of the last safety inspection result.

3.4. “unscheduled safety inspection” means the inspection of technical safety of equipment according to national technical standards and technical safety standards and will be carried out:

- after a repair, upgrade or renovation that affects the safety of equipment;

- after change of the location of installation;

- at the request of the user or a competent authority.

4. INSPECTION STEPS

Safety inspection shall be carried out in the following order:

- Inspection of the equipment profile/documents;
- External inspection;
- Technical inspection - No-load test;
- Load test - Test methods;
- Inspection result processing.

Note: Only take the next step if the equipment passes the test in the previous step. The result of each step shall be documented according to the form in the Appendix 01 and retained by the inspecting organization.

5. INSPECTION EQUIPMENT

Inspection equipment shall be inspected and calibrated in accordance with regulations. Inspection equipment includes:

- Theodolite;
- Altimeter (speedometer);
- Distance measuring equipment;
- Geometric inspection equipment;
- Dynamometer or hanging scale;
- Insulation resistance meter;
- Ground resistance meter;
- Multimeter;
- Clamp meter

6. CONDITIONS FOR INSPECTION

The inspection must not be carried out unless the following conditions are met:

6.1. The equipment is at the ready for inspection.

6.2. Documents about the equipment are adequate.

6.3. The inspection is not affected by environment or weather.

6.4. Requirements concerning occupational safety and health are met.

7. PREPARATION FOR INSPECTION

7.1. Before carrying out the inspection, the inspecting organization and the user shall reach an agreement on an inspection plan and prepare for the inspection and assign staff to participate in and witness the inspection.

7.2. Inspection of the profile of the equipment. Inspect the equipment profile and documents. The following documents shall be inspected according to inspection regulations:

7.2.1. Regarding first inspection:

- Equipment profile/documents, especially the following documents (under QCVN 07:2012/BLDTBXH):

+ Calculation of strength of load-bearing parts (if any);
+ Drawing which specify all main dimensions;
+ Guidelines for operation and maintenance.

- Equipment release documents:

+ Certificates of fabricated metal and weld metal (under 3.1.2 of TCVN 4244 : 2005);

+ Results of inspection of quality of weld joints (under 3.3.4 of TCVN 4244: 2005);

+ Factory acceptance record.

- Reports on results of and records on inspection of insulation grounding, lightning protection and resistance of the motor, protection devices (if any);

- Document on design and as-built document on the foundation or anchoring parts (according to the manufacturer's document or approved design).

- Installation documents;

- Certificate of conformity issued by the designated organization as prescribed.

7.2.2. Regarding periodic inspection:

- The previous profile, inspection record and inspection result report;

- Documents on the use, operation and maintenance of the equipment; inspection record (if any).

7.2.3. Regarding unscheduled inspection:

- In case of renovation or repair: documents on renovation or repair and commissioning record;

- In case of relocation: installation documents;

- The inspection record issued by competent authority (if any).

The document inspection result is satisfactory if the documents are adequate and the regulations of QCVN 07:2012/BLDTBXH are observed. If the result is unsatisfactory, the user shall take remedial actions.

7.3. Prepare suitable and adequate equipment for inspection.

7.4. Develop measures for ensuring safety and reach an agreement with the user before inspection. Provide adequate personal protective equipment to ensure safety during the inspection.

8. INSPECTION PROCESS

An inspection shall be carried out in the following order:

8.1. External inspection:

8.1.1. Check the installation location, electrical system, instruction manual, protective fences, ground, distance and safety measures, notable obstacles during inspection; conformity of parts and specifications of the equipment with those specified in the profile/documents.

8.1.2. Check all mechanisms or parts of the lifting equipment individually, pay particular attention to the condition of the following parts:

- Metal structure of the equipment, welds, riveted joints (if any), bolted joints of the metal structure, control room, ladder, platform and covers;

8.1.2.1. Load wire rope inspection:

- Type and diameter of the wire rope installed according to the equipment document;

- Wear and reduction in in the cross section of the steel wire rope according to 6.3 of TCVN 6780-2: 2009;

- Rust or other damage to wire rope according to Article 6.3.1 of TCVN 6780-2: 2009;

- Wire rope clamps and condition of wire rope on drum: meeting the manufacturer's requirements or according to the Appendices 18C and 21 of TCVN 4244 : 2005, for the equipment used in underground mining, complying with Article 7.6 of TCVN 6780-2: 2009;

- Hooks and parts of hook assembly (Appendices 13A, 13B and 13C of TCVN 4244: 2005);

8.1.2.3. Pulleys supporting and redirecting wire rope, parts used to fixed the pulley shaft: inspected and assessed according to Appendices 19A, 20A and 20B of TCVN 4244: 2005.

8.1.2.4. Gearbox: inspected and assessed according to 4.3.6 TCVN 6997: 2002.

8.1.2.5. Wire rope reel inspected according to 1.5.3.1.1 TCVN 4244: 2005;

8.1.2.6. Protective earthing and lightning protection system:

- Grounding resistance not exceeding exceed 4.0Ω, insulation resistance not exceeding 0.5 MΩ (test voltage 500V);

- Result of measurement of the lightning protection system according to TCXDVN 9385:2012.

8.1.2.7. Coupling between the motor and the gearbox, between the gear box and the wire rope reel.

8.1.2.8. Rail (if any) (Appendix 5 of TCVN 4244: 2005). Safety devices (height limiter, etc.);

8.1.2.9. Brakes: inspected and assessed according to 1.5.3.3 of TCVN 4244: 2005.

8.1.2.10. Safety brake (if any):

Inspect operation of safety brake when applied manually.

The equipment passes the test if it is installed according to the technical documents, no damage or defect is found and the requirements in section 8.1 are met.

8.2. Technical inspection - No-load test:

- Conduct no-load test of structures and equipment, including all structures, electrical equipment, safety devices, brakes, parking pawls, control equipment, lighting equipment, signals.

- Conduct the abovementioned tests at least 03 (three) times.

The equipment passes the test if its mechanisms and safety devices operate according to their specifications and design.

8.3. Load test - Test methods:

8.3.1. Static test:

- Test load: 125% of SWL (the safe working load must not be greater than the design load)

- The test load is pulled to the position with the greatest slope and held for 10 (ten) minutes.

The equipment passes the test if the load remains constant while it is being held for 10 (ten) minutes and after the load is lowered, the structures and parts of equipment have no crack, permanent deformation or other damage (according to 4.3.2 of TCVN 4244-2005).

8.3.2. Dynamic test:

- Conduct a dynamic test at 110% of SWL.

- Hoist and lower the load three times and check operation of other structures bearing such load;

The equipment passes the test if its structure and parts operate according to the design, the requirements specified by the applicable technical regulations are met and no crack, deformation or other damage is found.

8.3.3. Safety brake test (if any):

- Conduct a test load of safety brake at 110% of SWL.

- Run the winch at rated speed, apply the safety brake while the winch is operating.

The equipment passes the test if its structure and parts operate according to the design, the requirements specified by the applicable technical regulations are met and no crack, deformation or other damage is found.

9. INSPECTION RESULT PROCESSING

9.1. Prepare an inspection record which contains sufficient information according to the form in the Appendix 02 enclosed herewith.

9.2. Approve the inspection record:

Mandatory participants in the process of approving the inspection record:

- The representative of the user or a person authorized by the user;

- A witness;

- The inspectors.

When the record is approved, the inspector, the witness, and the representative of the user or a person authorized by the user shall append their signatures and seals (if any) on the record. The record shall be made into two (02) copies, each party shall keep 01.

9.3. Write the brief inspection result to the profile of the equipment (including full names of the inspectors and the date of inspection).

9.4. Put on the inspection stamp: if the equipment passes the test, the inspector shall put an inspection stamp on it at a noticeable position.

9.5. Issuance of certificate of inspection results:

9.5.1. If the equipment passes the test, the inspecting organization shall issue the certificate of inspection result to the equipment within 05 working days from the date on which the inspection record is approved.

9.5.2. If the equipment fails the test, only the steps in 9.1 and 9.2 shall be taken and the inspection record must specify the explanation for failed result, necessary remedial actions and a deadline for taking such actions. The inspection record shall be sent to the employment authority of the area where the equipment is installed and located.

10. INSPECTION INTERVAL

10.1. The equipment has to be inspected every 02 years. For the equipment that has been used for more than 12 years, it has to be inspected every year.

10.2. In the case where a shorter interval is demanded by the manufacturer or user, such interval shall apply.

10.3. If the inspection interval is shortened, the inspector shall specify explanation in the inspection record.

10.4. If the inspection interval is specified in national technical regulations, such regulations shall apply.

Appendix 01

SPECIMEN OF ON-SITE RECORD
(INSPECTION OF TECHNICAL SAFETY OF ELECTRIC WINCH FOR PULLING LOAD ON INCLINED PLANE)

(Name of inspecting organization)	**THE SOCIALIST REPUBLIC OF VIETNAM**
-------	**Independence - Freedom - Happiness**

…… [place], ……[date]

ON-SITE RECORD

No. .....

(written by the inspector)

1- General information

Name of the equipment:

…….…….…….…….

Name of the user: …….…….…….…….

Address (head office of the user):

…….…….…….……

Address (location) of the equipment:

…….…….…….

Content of the meeting with the user:

- Representative: (information)
- Witness:

2- Basic specifications:

- Code: .....
- Lifting speed: …….…….. m/min
- Production number: .....
- Pull length: …….. m
- Production year: .....
- Design load:..... tonnes
- Manufacturer: .....
- Uses: .....

3- Document inspection:

- Machine profile:
- Technical documents:

4- Code of measuring and testing equipment:

5- Equipment inspection:

a. External inspection:

+ Metal structure:
+ Hook and pulley assembly:…
+ Wire ropes and wire rope fixation:…

+ Protective grounding:

+ Rail and rail fixation:

+ Brakes:…

+ Safety devices:

+ Electrical system:

b. Technical inspection:

- 125% load test: (10-minute hold)

+ Brakes: ……

+ Metal structure:….

- 110% dynamic test:

+ Brakes (load holding)

+ Mechanisms and parts:

+ Metal structure:

6- Inspection of limiters, load indicator, overload indicator.

7. Processing and evaluation of inspection results.

8- Recommendations: (if any).

WITNESS	**INSPECTOR**
(Signature and full name)	*(Signature and full name)*

Appendix 02

SPECIMEN OF RECORD ON INSPECTION OF TECHNICAL SAFETY OF ELECTRIC WINCH FOR PULLING LOAD ON INCLINED PLANE

(Name of inspecting organization)	**THE SOCIALIST REPUBLIC OF VIETNAM**
-------	**Independence - Freedom - Happiness**

…… [place], ……[date]

RECORD ON INSPECTION OF TECHNICAL SAFETY
(ELECTRIC WINCH FOR PULLING LOAD ON INCLINED PLANE)

No. …….

(According to the on-site record No. ……..)

We are:

1. …… Inspector number:

……

2. …… Inspector number:

……

Inspecting organization:

…….

Registration certificate No. ……

Name of the inspected equipment:…… ……

Name of the user: ……..……..……

Address (head office of the user): ……..……..……..……

Address (location) of the equipment:

……..……

Inspection procedure and standards applied: ……

Individuals witnessing and approving the record:…… ……

1…… Position:……..……

2…… Position:……..……

I- BASIC SPECIFICATIONS

- Code: ..... - Design load:..... tonnes
- Production number: .....- Pulling speed: …….. m/min
- Production year: - Pull speed: ..... m

.....

- Manufacturer: ..... - Greatest slope: ..... degree
- Uses: .....

II- FORMS OF INSPECTION

First time □ Periodic □ Unscheduled □

Reason for unscheduled inspection: ……

III- INSPECTION CONTENT:

A-Technical document inspection:

- Comments: ……...
- Result evaluation:

No.	Item	Passed	Failed	Note
1	Crane profile			

B- External inspection; no-load test:

- Comments:

……..……..……

- Result evaluation:

No.	**Mechanism; part**	**Passed**	**Failed**	**Note**	**No.**	**Mechanism; part**	**Passed**	**Failed**	**Note**
1	Pull hook				10	Load hoisting mechanism			
2	Wire rope reel				11	Load pulling brake			
3	Pulling wire rope				12	Whistle/bell			

4	Guide pulley				13	Grounding, lightning protection			
5	Balancing pulley				14	Protective fence			
6	Base				15	Anchor winch			
7	Control system				16	Guide pulley hanging mechanism			
8	Pull limiter				17	Guide pulley fixing mechanism			
9	Safety brake								

C-Load test:

- Comments:

……..……..……..……..

- Result evaluation:

No.	Load pulling position and test result	Passed	Failed	Corresponding pulling load (tonnes)	Static test load (tonnes)	Dynamic test load (tonnes)
1	Carrying hook/equipment					
2	Stability					

No.	Result evaluation	Passed	Failed	Note	No.	Result evaluation	Passed	Failed	Note
1	Base				6	Load pulling rope			
2	Anchor winch				7	Control system			
3	Load pulling brake				8	Guide pulley hanging and fixing mechanism			
4	Load hoisting mechanism				9	Pull limiter			
5	Safety brake								

IV - CONCLUSIONS AND RECOMMENDATIONS

1. Result: Passed □ Failed □

Maximum load/slope: …….tonnes/ ……degree.

2. Inspection stamp No. …… At: …….……

3. Recommendations: …….……

Deadline for implementation of recommendations: …….....

V- INSPECTION INTERVAL

Date of next inspection:

Reasons for shortened interval (if any):

The record is approved on:

At: …….……

The record is made into of .... copies, each party holds.... copies./.

EQUIPMENT USER	**WITNESS**	**INSPECTOR**
(Full name and signature) (Undertaking to fulfill recommendations in sufficient and timely manner)	*(Signature and full name)*	*(Signature and full name)*

PROCEDURES FOR TECHNICAL INSPECTION OF SAFETY OF HAND WINCHES

QTKD: 16- 2016/BLDTBXH

Foreword

Procedures for inspection of technical safety of hand winches are drafted by the Department of Work Safety and promulgated together with the Circular No. 54/2016/TT-BLDTBXH dated December 28, 2016 of the Ministry of Labour, Invalids and Social Affairs.

PROCEDURES FOR TECHNICAL INSPECTION OF SAFETY OF HAND WINCHES

1. SCOPE AND REGULATED ENTITIES

1.1. Scope

Such procedures shall be used for first, periodic and unscheduled inspection of hand winches with a load capacity of 1,000kg or more under state management of the Ministry of Labour, Invalids and Social Affairs.

1.2. Regulated entities

- Organizations carrying out occupational safety inspection;

- Occupational safety inspectors.

2. NORMATIVE REFERENCES

- TCVN 4244:2005, Lifting appliances - Design construction and survey.

- TCVN 5207:1990, Loading crane - Safety requirements.

- TCVN 5864:1995, Lifting appliances - Wire ropes, drums, pulleys, chains and chain wheels.

- TCVN 9385:2012, Protection of structures against lightning - Guide for design, inspection and maintenance.

- QCVN 7: 2012/BLDTBXH, National technical regulation on safe work of lift appliances;

In the cases where the abovementioned normative references are amended or replaced, regulations of the latest references shall apply.

Other standards may be applied to hand winches at the request of their user or manufacturer if such standards contain the same or higher safety criteria than those in the national standards referred to in this document.

3. TERMS AND DEFINITIONS

For the purposes of this document, the terms and definitions given in the abovementioned normative references and the following shall apply:

3.1. “hand winch” means a hand-operated lifting mechanism, consisting of a drum or chain wheel drive transmission used to lift or pull loads. The winch can be operated as stand-alone equipment or as a part of other complex lifting equipment.

3.2. “first safety inspection” means the inspection of technical safety of equipment according to national technical standards and technical safety standards after its installation and before its first use.

3.3. “periodic safety inspection” means the inspection of technical safety of equipment according to national technical standards and technical safety standards after expiration of the last safety inspection result.

3.4. “unscheduled safety inspection” means the inspection of technical safety of equipment according to national technical standards and technical safety standards and will be carried out:

- after a repair, upgrade or renovation that affects the safety of equipment;
- after change of the location of installation;
- at the request of the user or a competent authority.

4. INSPECTION STEPS

Safety inspection shall be carried out in the following order:

- Inspection of the equipment profile/documents;
- External inspection;
- Technical inspection - No-load test;
- Load test - Test methods;
- Inspection result processing.

Note: Only take the next step if the equipment passes the test in the previous step. The result of each step shall be documented according to the form in the Appendix 01 and retained by the inspecting organization.

5. INSPECTION EQUIPMENT

Inspection equipment shall be inspected and calibrated in accordance with regulations. Inspection equipment includes:

- Altimeter (speedometer);
- Distance measuring equipment;
- Geometric inspection equipment;
- Dynamometer or hanging scale.

6. CONDITIONS FOR INSPECTION

The inspection must not be carried out unless the following conditions are met:

6.1. The equipment is at the ready for inspection.

6.2. Documents about the equipment are adequate.

6.3. The inspection is not affected by environment or weather.

6.4. Requirements concerning occupational safety and health are met.

7. PREPARATION FOR INSPECTION

7.1. Before carrying out the inspection, the inspecting organization and the user shall reach an agreement on an inspection plan and prepare for the inspection and assign staff to participate in and witness the inspection.

7.2. Inspect the equipment profile and documents. The following documents shall be inspected according to inspection regulations:

7.2.1. Regarding first inspection:

- Equipment profile/documents, especially the following documents (under QCVN 07:2012/BLDTBXH):

+ Calculation of strength of load-bearing parts (if any);

+ Drawing which specify all main dimensions;

+ Guidelines for operation and maintenance.

+ Certificates of fabricated metal and weld metal (under 3.1.2 of TCVN 4244 : 2005);

+ Results of inspection of quality of weld joints (under 3.3.4 of TCVN 4244: 2005);

+ Factory acceptance test results.

- Reports on results of and records on inspection of lightning protection (if any);

- Installation documents;

7.2.2. Regarding periodic inspection:

- The previous profile, inspection record and inspection result report;

- Documents on the use, operation and maintenance of the equipment; inspection record (if any).

7.2.3. Regarding unscheduled inspection:

- In case of renovation or repair: documents on renovation or repair and commissioning record;

- In case of relocation: installation documents;

- The inspection record issued by competent authority (if any).

The document inspection result is satisfactory if the documents are adequate and the regulations of QCVN 07:2012/BLDTBXH are observed. If the result is unsatisfactory, the user shall take remedial actions.

7.3. Prepare suitable and adequate equipment for inspection.

7.4. Develop measures for ensuring safety and reach an agreement with the user before inspection. Provide adequate personal protective equipment to ensure safety during the inspection.

8. INSPECTION PROCESS

An inspection shall be carried out in the following order:

8.1. External inspection:

8.1.1. Check the installation location, electrical system, instruction manual, protective fences, ground, distance and safety measures, notable obstacles during inspection; conformity of parts and specifications of the equipment with those specified in the profile/documents.

8.1.2. Check all mechanisms or parts of the lifting equipment individually, pay particular attention to the condition of the following parts:

- Connection between the hand winch and the winch location (according to the manufacturer's instructions);

- Metal structure and crank of the winch, welds, riveted joints (if any), bolted joints of the metal structure, platform and covers; (according to the Appendices 1, 2 and 6 of TCVN 4244: 2005);

- Hooks and parts of hooks (Appendices 13A, 13B and 13C of TCVN 4244: 2005);

- Wire ropes and parts used to fix wire ropes (meeting the manufacturer's requirements or refer to Appendices 18C and 21 of TCVN 4244: 2005);

- Pulleys, shafts and pulley shaft fixing parts (Appendices 19A, 20A and 20B of TCVN 4244: 2005);

- Drum inspected and assessed according to 1.5.3.1.1 of TCVN 4244: 2005;

- Brakes (parking pawls or automatic braking mechanism);

- Chain and chain wheel (3,4 of TCVN 5864:1995).

The equipment passes the test if it is installed according to the technical documents, no damage or defect is found and the requirements in section 8.1 are met.

8.2. Technical inspection - No-load test:

- Conduct no-load tests of all structures, safety devices, brakes, clips;

- Conduct the abovementioned tests at least 03 (three) times.

The equipment passes the test if its mechanisms and safety devices operate according to their specifications and design and satisfy the regulations set out in 8.2.

8.3. Load test - Test methods:

8.3.1. Static test:

- Test load: 125% of SWL (the safe working load must not be greater than the design load)

- Conduct the static test according to 4.3.2 of TCVN 4244: 2005.

The equipment passes the test if the load remains constant while it is being held for 10 (ten) minutes and after the load is lowered, the structures and parts of equipment have no crack, deformation or other damage (according to 4.3.2 of TCVN 4244-2005).

8.3.2. Dynamic test:

- Conduct a dynamic test at 110% of SWL. Hoist and lower the load three times and check operation of other structures bearing such load;

- Conduct the dynamic load test according to the type of equipment and 4.3.2 of TCVN 4244: 2005.

The equipment passes the test if its structure and parts operate according to the design, the requirements specified by the applicable technical regulations are met and no crack, deformation or other damage is found.

9. INSPECTION RESULT PROCESSING

9.1. Prepare an inspection record which contains sufficient information according to the form in the Appendix 02 enclosed herewith.

9.2. Approve the inspection record:

Mandatory participants in the process of approving the inspection record:

- The representative of the user or a person authorized by the user;
- A witness;
- The inspectors.

When the record is approved, the inspector, the witness, and the representative of the user or a person authorized by the user shall append their signatures and seals (if any) on the record. The record shall be made into two (02) copies, each party shall keep 01.

9.3. Write the brief inspection result to the profile of the equipment (including full names of the inspectors and the date of inspection).

9.4. Put on the inspection stamp: if the equipment passes the test, the inspector shall put an inspection stamp on it at a noticeable position.

9.5. Issuance of certificate of inspection results:

9.5.1. If the hand winch passes the test, the inspecting organization shall issue the certificate of inspection result to the equipment within 05 working days from the date on which the inspection record is approved.

9.5.2. If the hand winch fails the test, only the steps in 9.1 and 9.2 shall be taken and the inspection record must specify the explanation for failed result, necessary remedial actions and a deadline for taking such actions. The inspection record shall be sent to the employment authority of the area where the hand winch is installed and located.

10. INSPECTION INTERVAL

10.1. An hand winch has to be inspected every 02 years. For the hand winch that has been used for more than 12 years, it has to be inspected every year.

Regarding a mobile hand winch, it has to be inspected every year.

10.2. In the case where a shorter interval is demanded by the manufacturer or user, such interval shall apply.

10.3. If the inspection interval is shortened, the inspector shall specify explanation in the inspection record.

10.4. If the inspection interval is specified in national technical regulations, such regulations shall apply.

Appendix 01

SPECIMEN OF ON-SITE RECORD
(INSPECTION OF TECHNICAL SAFETY OF HAND WINCH)

(Name of inspecting organization)	**THE SOCIALIST REPUBLIC OF VIETNAM**
-------	**Independence - Freedom - Happiness**

…… [place], ……[date]

ON-SITE RECORD

No. .....

(written by the inspector)

1- General information

Name of the equipment:

…….

Name of the user: …….

Address (head office of the user): …….

Address (location) of the equipment:

…….

Content of the meeting with the user:

- Representative: (information)
- Witness:

2- Basic specifications:

- Code: .....
- Design load:..... tonnes
- Production number: .....
- Lifting (lowering) height of hooks:..... m
- Production year:
- Uses: .....

.....

- Manufacturer: .....

3- Document inspection:

- Machine profile:
- Technical documents:

4- Code of measuring and testing equipment:

5- Equipment inspection:

a. External inspection:

+ Metal structure:
+ Hook and pulley (Chain wheel) assembly:...
+ Wire ropes (chain) and wire rope fixation:…
+ Brakes, retaining clips:....
+ Drum

b. Technical inspection:

- 125% load test: (10-minute hold)

+ Brakes, retaining clips:
+ Metal structure:….

- 110% dynamic test:

+ Brakes, retaining clips:

+ Mechanisms and parts:

+ Metal structure:

6- Processing and evaluation of inspection results:

7- Recommendations:

WITNESS	**INSPECTOR**
(Signature and full name)	*(Signature and full name)*

Appendix 02

SPECIMEN OF RECORD ON INSPECTION OF TECHNICAL SAFETY OF HAND WINCH

(Name of inspecting organization)	**THE SOCIALIST REPUBLIC OF VIETNAM**
-------	**Independence - Freedom - Happiness**

…… [place], ……[date]

RECORD ON INSPECTION OF TECHNICAL SAFETY OF HAND WINCH

No. …….

(According to the on-site record No. ……..)

We are:

1. …… Inspector number:

……

2. …… Inspector number:

……

Inspecting organization:

……

Registration certificate No. ……

Name of the inspected equipment:……. ……

Name of the user: ……..……..……

Address (head office of the user): ……

Address (location) of the equipment:

……

Inspection procedure and standards applied: ……

Individuals witnessing and approving the record:…… ……

1…… Position:……

2…… Position:……

I- BASIC SPECIFICATIONS

- Code: ..... - Design load:..... tonnes

- Production number: ..... - Lifting (lowering) height of hooks:..... m

- Production year: - Uses: .....

.....

- Manufacturer: .....

II- FORMS OF INSPECTION

First time □ Periodic □ Unscheduled □

Reason for unscheduled inspection: ……

III- INSPECTION CONTENT:

A-Technical document inspection:

- Comments:

……..

- Result evaluation:

No.	Item	Passed	Failed	Note
1	Profile			
2	Technical documents			

B- External inspection; no-load test:

- Comments:

……

- Result evaluation:

No.	Mechanism; part	Passed	Failed	Note	No.	Mechanism; part	Passed	Failed	Note
1	Hook				5	Control mechanism			
2	Pulley (chain reel) assembly				6	Brake (retaining clip)			
3	Load rope (chain)				7	Drum			
4	Metal structure; connection with the building				8	Grounding, lightning protection			

C-Load test:

- Comments:

……

- Result evaluation:

No.	Load holding position and test result	Passed	Failed	Corresponding load (tonnes)	Static test load (tonnes)	Dynamic test load (tonnes)

1	On the hook					
2	Stability					

No.	Result evaluation	Passed	Failed	Note
1	Metal structure			
2	Load rope (chain)			

No.	Result evaluation	Passed	Failed	Note
3	Brake (retaining clip)			
4	Hoisting mechanism			

IV - CONCLUSIONS AND RECOMMENDATIONS

1. Result: Passed □ Failed □

Maximum load: ..... tonnes.

2. Inspection stamp No. :…… At: ……

3. Recommendations: ……

Deadline for implementation of recommendations:

V- INSPECTION INTERVAL

Date of next inspection:

Reasons for shortened interval (if any):

The record is approved on:

At: …….

The record is made into of .... copies, each party holds.... copies./.

EQUIPMENT USER	WITNESS	INSPECTOR
(Full name and signature) *(Undertaking to fulfill recommendations in sufficient and timely manner)*	*(Signature and full name)*	*(Signature and full name)*