

# **NMAS NATIONAL MINE ACTION STANDARDS**



**TCVN 10299-5:2014**

First edition

**ADDRESSING THE POST-WAR CONSEQUENCES  
OF MINES/ERW  
PART 5: SAFETY PROCEDURES IN DEMINING OPERATIONS**

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## **Foreword**

TCVN 10299-1:2014 was drafted by the Technical Standard Department of Engineering Command, requested by the Ministry of Defense, appraised by the Directorate for Standards, Metrology and Quality and published by the Ministry of Science and Technology.

TCVN 10299:2014 – *Addressing the post-war consequences of mines/ERW*, includes 10 parts:

- TCVN 10299-1:2014, *Part 1: General provisions*;
- TCVN 10299-2:2014, *Part 2: Assessment and Accreditation of demining organizations*;
- TCVN 10299-3:2014, *Part 3: Monitoring and Evaluation of demining organizations*;
- TCVN 10299-4:2014, *Part 4: Non-technical Survey and Technical Survey*;
- TCVN 10299-5:2014, *Part 5: Demining safety*;
- TCVN 10299-6:2014, *Part 6: Clearance of mines/ERW*;
- TCVN 10299-7:2014, *Part 7: Explosive Ordnance Disposal (EOD)*;
- TCVN 10299-8:2014, *Part 8: Medical support for demining operations*;
- TCVN 10299-9:2014, *Part 9: Investigation of demining incidents*;
- TCVN 10299-10:2014, *Part 10: Management of information*;

# Addressing the post-war consequences of mines/ERW -

## Part 5: Safety procedures in demining operations

### 1 Scope

This standard specifies the requirements to ensure safety during demining operations and also specifies the responsibilities of relevant people and organizations.

This must be applied for organizations with demining activities and other relevant structures and organizations.

### 2 References

The following references are necessary for the application of this standard. For dated references, the cited edition shall be applied. For undated references, the latest edition of the normative documents referred to shall be applied, including amendments or supplements (if any).

TCVN 10299-1:2014, *Part 1: General provisions*;

TCVN 10299-7:2014, *Part 7: Explosive Ordnance Disposal (EOD)*;

TCVN 10299-8:2014, *Part 8: Medical support for demining operations*;

### 3 Terms and definitions

This standard uses terms and definitions specified in TCVN 10299-1:2014 and the following terms and definitions:

#### 3.1

##### Safety

A demining operation can be performed without incident and accident.

#### 3.2

##### Safety procedure

Measures applied to avoid or prevent any situation that might lead to an unsafe demining operation.

### 4 Requirements

#### 4.1 General requirements

**4.1.1** Every item of a demining operation shall strictly follow the safety regulations and rules prescribed by the authorized organization, based on the approved technical construction plans; the deployment steps shall be closely organized and directed in a sequential manner. During an operation, any arbitrary

change is strictly prohibited. If a situation requires any change from the original procedure, it must be approved in writing by the competent authorities.

**4.1.2** A demining operation shall not be executed until all of the approved documents are received.

**4.1.3** Operations must be done sequentially as instructed in their technical plans. Any shortcut or neglect is prohibited.

**4.1.4** After a stormy period, or after a period of suspension lasting multiple days, all safety conditions shall be re-examined in order to continue, especially in high-risk places.

**4.1.5** Water and other needs of staff must be ensured.

**4.1.6** During a demining operation, the leader shall apply measures to improve working conditions of staff members, reduce the amount of heavy manual work, and reduce and prevent the effect of toxic substances on the staffs health.

**4.1.7** Demining operations shall not be executed under the following weather conditions: rain, storm, thunder, lightning, temperatures over 40°C and under 10°C and darkness. Special cases shall be determined on a case-by-case basis by an authorized organization.

## **4.2 Human requirement**

**4.2.1** The leader of a demining organization, the leader of an operational site, the team leader and the safety officer shall be thoroughly trained and shall follow every regulation and rule regarding safety procedures.

**4.2.2** The team leader, constructions unit's leader and safety officer shall fulfill their responsibilities and follow all labor protection regulations.

**4.2.3** Demining technical officers shall meet all the health requirements stipulated in TCVN 10299-8:2014. Officers shall be fully equipped with survey equipment and certified with a practicing certificate. They shall be equipped with labor protection equipment during work.

**4.2.4** Under-water disposal technical officers shall have good health, along with excellent swimming and diving skills, with a diving certificate issued by an authorized organization. Moreover, they shall be ensured security regarding the working regime, remuneration and health care.

**4.2.5** Only technical officers who can swim shall be allowed to work in water and they shall be fully equipped with safety equipment and other emergency tools as instructed in the regulations.

**4.2.6** Technical officers working at a field with a dangerous slope must be fully equipped with safety equipment.

**4.2.7** Technical officers working on the fields must follow the instructions of the safety equipment assigned.

**4.2.8** Officers who work in an environment with toxic elements exceeding acceptable standards shall receive a compensation in kind as instructed in the current regime.

**4.2.9** Deminers shall not be allowed to carry with them magnetic objects like: mobile phones, watches, and keys

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**4.2.10** Smoking, flammable objects (matches, lighters, mobile phones...), alcoholic drinks and other stimulants are forbidden on the field during working time.

**4.2.11** Officers with survey duties shall only walk within their assigned areas, and shall not walk freely on the field.

### **4.3 Equipment requirements**

**4.3.1** All equipment shall meet technical demands and shall not have reached its expiry date.

**4.3.2** Safety equipment and tools shall be suitable for working conditions as instructed in regulations and rules.

**4.3.3** All equipment, medication, HR and transportation shall be ready at all times in case of emergency.

**4.3.4** Diving equipment shall meet technical and safety demands.

**4.3.5** The quantity and quality of disposal, salvaging and labor protection equipment shall be ensured.

**4.3.6** Before every shift, all equipment shall go through a technical assessment.

**4.3.7** Ships and boats for surveys shall only navigate within their assigned areas.

**4.3.8** Unfamiliar ships and boats that come by demining areas shall reduce their speed and keep a minimum distance of 50 meters from the safety limit.

### **5 Safety in ground preparation for demining**

**5.1** Warning signs and guard stations shall be arranged and displayed around a demining area in order to prevent entry by unauthorized people, vehicles and animals.

**5.2** Camps and other constructions on a demining field shall be arranged in an appropriate manner.

**5.3** The storage of bombs, mines and ERW shall be placed at an appropriate location that is distant from residential areas and other constructions. It shall be guarded at all times.

### **6 Safety in demining**

#### **6.1 Safety in ground clearance**

**6.1.1** During ground clearance, there shall be a minimum distance of 25 meters between any two workers.

**6.1.2** During a manual ground clearance involving burning by gasoline and oil, there shall be appropriate measures in place to prevent fire from spreading, the clearance shall be strictly guarded, and all staff in their hiding position. All entry to the field shall be prohibited in at least 4 hours after burning.

**6.1.3** While executing ground clearance using explosives, a safety distance shall be maintained for all people, equipment and surrounding constructions.

**6.1.4** Ground preparation underwater shall only be performed with safety equipment fully prepared. Water depth, flow rate, daily tide and other elements shall be tested in order to reduce negative impacts on the demining mission.

## **6.2 Safety in surveys**

**6.2.1** Before every shift, demining staff shall perform a quantity and quality check for all equipment (bomb detectors, mines detectors, sticks, knives, safety latches, disposal tools ...) to make sure that they meet technical requirements and are in good condition.

**6.2.2** Surveys shall be performed sequentially as instructed in the regulations.

**6.2.3** Ground clearance is mandatory before a survey.

**6.2.4** Users of detectors shall maintain a safety distance as stipulated in the rules and regulations.

## **6.3 Safety in digging and signal handling**

**6.3.1** Anyone who is to be assigned digging and signal handling tasks shall be in good health, be meticulous, they must have certified training and a high level of technical expertise, and a sense of responsibility.

**6.3.2** Every step shall be done as instructed in the issued regulations.

**6.3.3** Before digging, technical staff shall examine the state of the ground and check the signal in order to devise suitable digging methods.

**6.3.4** If digging works are to be done in areas with a risk of landslides, precaution shall be taken and emergency measures well prepared in case of accident.

**6.3.5** Personal safety equipment is required at all times.

**6.3.6** Always ensure the steadiness of hand tools.

**6.3.7** Dirt dug from the bottom of the hole shall be put away at least 0.5 meter from the hole. Dirt shall be arranged in sloped piles, in order to prevent landslides.

**6.3.8** Digging on slopes shall be performed with measures designed to prevent sudden rolling stones and dirt.

**6.3.9** Holes deeper than 2 meters shall be worked on by at least 2 workers who shall maintain a safety distance from one another in order to be prepared to assist in case of emergency.

**6.3.10** Do not arrange workers to work on the brim of a deep hole in which others are working, in order to avoid rolling stones and dirt that may hurt workers.

**6.3.11** Do not rest beside a hole or piled dirt.

**6.3.12** All positions where bombs, mines and explosives are found shall be marked with flags (or signs) and only disposal officers shall be allowed to enter these positions under the commander's order.

**6.3.13** The minimum safety distance between 2 disposal officers shall be greater than the largest lethal radius of the mines found on site, but not less than 15 meters.

**6.3.14** Signal handling shall only be performed by one person. When unidentified mines or explosives are detected, the scene shall be kept unchanged and site commander informed immediately in order to find a proper method of disposal.

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**6.3.15** In the case where bombs or explosives found cannot be retrieved and disposed of in the same day, flags and signs shall be used for markings as instructed in regulations, and there shall be guards in place until disposal is finalized.

### **6.4 Safety in collection and transportation**

**6.4.1** All transportation of supplies, machines, equipment and also bombs, mines and ERW found in demining operations shall strictly respect the traffic laws issued by the Ministry of Traffic and Transportation.

**6.4.2** Before loading, all the technical specifications (dimensions, weight, and distance of transportation) of machines, equipment and supplies shall be thoroughly considered in order to guarantee safety.

**6.4.3** Loading staff shall meet the health requirements of their task.

**6.4.4** The loading ground shall be well-organized, the way in and the way out shall be well-regulated for all staff and loading vehicles in order to guarantee ease of access and safety.

**6.4.5** Transportations of dangerous flammables and explosive bombs, mines and EW shall be done using appropriate vehicles as instructed in regulations.

**6.4.6** The loading of equipment and supplies in low light conditions is prohibited. Insufficient natural light shall be compensated with artificial lighting. The loading of flammables and explosives shall be executed using specialized explosion-proof lamps.

**6.4.7** Bombs, mines and ERW collected and loaded for transportation to disposal sites shall be arranged parallel to the vehicle's direction of movement. They shall be tightly tied and fixed in order to avoid any collision and movement during transportation. Do not load more than two-thirds of a vehicle's load.

**6.4.8** The transportation of big sized bombs, mines and ERW must be done using a lever with cables to ensure safety. Nothing shall be done directly using bare hands.

**6.4.9** A transportation vehicle's tank shall be coated with a layer of sand thicker than 10 centimeters.

**6.4.10** Do not transport bombs, mines and ERW together with gasoline, oil and other flammable substances.

**6.4.11** Bomb, mine and ERW transportation vehicles shall at the maximum carry only 3 persons: Main driver, escorting officer and supporting driver (if needed).

**6.4.12** Collected bombs, mines and ERW shall be arranged among sand bags in order to ensure staff's safety (especially on the side of the tank adjacent to the cabin).

**6.4.13** Vehicles transporting bombs, mines and ERW shall not cross the city or crowded places. In cases where this is unavoidable, there shall be written consent from the authority and it shall only be executed in the night, in empty places and in close communication with responsible agencies regarding the routes taken. These vehicles shall not park or stop in crowded places or in close proximity to storage places.

**6.4.14** Bombs, mines and ERW collected shall not be brought home or to residential places.

**6.4.15** All transportation shall be recorded in the operation's journal in order to avoid any mistake and prevent any bomb, mine and ERW from disappearing



## **6.5 Safety in salvaging bombs, mines and ERW**

**6.5.1** Only salvage disposed bombs, mines and ERW.

**6.5.2** Salvaging shall be done using specialized tools.

**6.5.3** Slowly pull ERW out of the water and put it on the composite boat, rubber boat or wooden boat/barrel on ships ...

**6.5.4** Arrange and fix all warhead positions to avoid any collision.

## **6.6 Safety in the disposal of bombs, mines and EWR**

**6.6.1** A plan for destroying mines and explosive devices shall be approved by competent authorities.

**6.6.2** Disposal methods shall comply with TCVN 10299-7:2014.

**6.6.3** Choose a suitable method of destruction depending on the type of bombs, mines and ERW found

**6.6.4** During disposal operations, operators shall abide by the issued safety rules.

**6.6.5** At disposal areas, there shall be safety stations at necessary locations. Hiding positions shall be available for operators and the operation commander.

**6.6.6** Bombs, mines and ERW that can not be demined shall be destroyed onsite (if conditions allow).

**6.6.7** Bombs, mines and ERW shall be destroyed only at the end of each working shift.

**6.6.8** After each session of destruction, an overall safety check is required before pullout.

## **6.7 Working time**

**6.7.1** The working time for staff involved in searching, digging and disposal shall not exceed 6 hours per day

**6.7.2** The working time for underwater signal-processing staff shall not exceed 4 hours per day.

## **7 Responsibilities of the demining operation's commander:**

**7.1** The leader of an operation site has the direct responsibility before his/her superiors and the law for the implementation of onsite demining. Without complete records (technical plan, construction planning...) and safety measures, no construction shall be allowed

**7.2** During a demining operation, the leader shall be present at the site to remind staff, and ensure and enforce respect for construction plans, as well as comply with safety regulations to avoid any demining accidents.

**7.3** Understand emergency evacuation plans and procedures for different scenarios in order to avoid vulnerability in unexpected situations

**7.4** Designate a safety in-charge, guide, and supervisor and establish strict policies stating their responsibilities.

**7.5** Ensure the proper provision of personal protective equipment.

**7.6** The responsibilities in ensuring safety requirements relating to machinery and equipment (tools, construction equipment), including collective and personal protective equipment, are as follows:

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- The management entity shall be responsible for the technical conditions of machinery and equipment;
- The operational unit shall be responsible for ensuring compliance with workers' protection requirements during the demining operation.

**7.7** Information on safety rules and guides shall be readily available to other individual parties participating in demining activities.

**7.8** At an operational site, a safety diary shall be kept for complete records of incidents, accidents, solutions and remedies (if any) during the operation.

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