Safety of Teaching and Training of Large-scale Vehicle Ice and Snow Driving in Cold Regions in Winter

Long Lee[1,a*], Yuehua Wu[2,b] and Chao Gao[3,c]

[1]Army Academy of Armored Forces, NCO, 130000 Changchun, China

[2]32382 troops, 100072 BeiJing, China

[3]Shenyang Bureau in the Liaoyang area military representative room, 111000 LiaoYang, China

[a] 530046111@qq.com; [b] 110133816@qq.com; [c]363349356@qq.com

Keywords: Cold regions; Snow and Ice; Teaching and Training; Large-scale Vehicles

Abstract. The importance of the safety in teaching and training of large-scale vehicle ice and snow driving is clarified. According to the characteristics of winter ice and snow driving teaching and training in cold regions, the causes of safety accidents in teaching and training are analyzed, and the countermeasures for the safety of teaching and training of Large-scale Vehicles in ice and snow driving are carried out.With the increase of teaching and training workload, the training requirements and training difficulty are increasing, and affected by many conditions such as personnel quality, vehicle technical status, terrain, roads, climate, etc. It may cause various accidents.

In the cold region, the winter temperature is low, the cold period is long, the wind and snow are thick, the snow is thick, the icing period is long, the frozen soil layer is thick, and the road is easily blocked. These extreme conditions are organized in the cold area to teach and train. The big impact has increased many safety hazards. If it is not solved well, it will reduce the training effect and even cause casualties and vehicles damage. Therefore, in the winter and winter large-scale vehicle ice and snow driving teaching training, training safety as an important factor affecting the teaching effect must be paid enough attention to the participants of the college teaching and training activities.

1. The Importance of Teaching and Training Safety

1.1 Training Safety is an Important Guarantee for the Generation of Teaching Ability.

Training safety concerns the consolidation and improvement of the teaching ability of colleges and universities. The starting point and the foothold of all the work of the college are closely related to improving the teaching effect. Teaching and training organizations are well organized, well-managed, and training can play their due role and promote the generation of teaching ability. If there is a problem in the training, resulting in an accident, it will weaken the teaching power of the college and become a "roadblock" and "stumbler" for the construction of colleges and universities. Therefore, training safety is an important guarantee to achieve teaching results and improve teaching ability.

1.2 Safety Accidents Seriously Affect the Healthy Development of Colleges and Universities.

An accident occurs frequently in a short period of time, which is not uncommon in real work. An accident occurs frequently in a short period of time, which is not uncommon in real work. Many blood lessons warn us that if an accident occurs in teaching and training, especially a major accident, it will not only seriously affect the effect of teaching and training, but also often bring other negative effects, such as severely damaging training enthusiasm, affecting morale, and increasing internal contradictions , etc. Seriously interfered with daily work, it may cause the work to lose sight of one another, causing undesirable chain reactions, and will cause unnecessary losses to the curriculum construction, affecting the healthy development of the college as a whole. Therefore, the prevention of snow and ice driving safety accidents should be placed in an important position to prevent or reduce accidents.

  DOI: 10.25236/sser.2019.123

1.3 Preventing Safety Accidents and Teaching and Training Complement Each Other

Some people think that it is wrong to prevent safety accidents from being safe. Not engaging in training does not mean that there is no accident. It is not necessarily necessary to have an accident in training. Some institutions do not engage in teaching and training for a long time, the management is not good in class, the requirements are not strict, the technology is not skilled, and the vehicles cannot be properly used for maintenance. The possibility of accidents is not reduced, but increased. On the contrary, those institutions that pay close attention to teaching and training, because of their rich teaching experience, strict organization, good quality and skill, can deal with the situation correctly, and the possibility of accidents is reduced. From this point of view, anti-accident and teaching training are not antagonistic, but dialectical and unified[1].

2. Characteristics of Winter Ice and Snow Driving Teaching Training in Cold Regions

2.1 Teaching and Training Safety is Greatly Affected by Environmental Factors

In China, the cold area mainly refers to the “three north” areas, namely, the northeast, northwest and parts of northern China. The common feature of these areas is that the winter time is long, the average temperature is low, and the temperature is below zero for about 5-6 months. The minimum temperature can reach below minus 40 °C. River icing and snow area have a considerable impact on Vehicles technical performance, use, maintenance, storage, maintenance and rescue operations. Correspondingly, the security risks have also increased a lot.

2.2 The Safety of Teaching and Training is Greatly Affected by the Vehicles Itself

Large-scale Vehicles must have good protection performance, high maneuverability and strong attack performance, which will increase the quality of the whole vehicle, which brings a series of problems, such as the body of the car is very heavy, super long, super wide and super high, and the driver's observation horizon is greatly restricted, which brings great hidden danger to the safety of vehicle movement. In the winter of cold regions, the rider and the crew are in extremely harsh conditions, and there is no reliable member protection equipment, which is easy to frostbite, the driver's operation is complicated and laborious, and the occupants are prone to fatigue, so it is greatly increased compared with ordinary vehicles.

2.3 Teaching and Training Safety is Greatly Affected by the Skill Level of Personnel

The snow is big and deep in the winter of cold regions, the operation of large-scale vehicles is generally more complicated, especially shifting and steering. In addition, the road is covered with snow, the driver's observation horizon is limited, and the snow is reflective, and long-term observation is easy to dazzle. Therefore, affected by many conditions, the skill level of the trainees has a great impact on safety. The training is generally aimed at beginners. At this stage, the basic skills of driving are not comprehensive enough, solid, and the action coordination is not skilled enough. There is no experience in dealing with various complicated situations, and the ability to properly handle unexpected situations is poor, and the unsafe factors during driving increase the probability of accidents, and the safety of personnel inside and outside the vehicle is greatly reduced.

2.4 The safety of teaching and training is greatly affected by the psychological quality of personnel

Driving in ice and snow, the driver is prone to fear, fear that the vehicle is out of control, and there is not enough safety in his life. After the fear is generated, not only can it not play professional skills, but it will also cause the driver to make operational mistakes in the initial stage, and can not concentrate all the spirit on the handling of the vehicle, resulting in major dangers and major training accidents.

3. Reasons for teaching and training safety accidents[2]

3.1 Organizational Discipline is Poor, Violation of Regulations, Cadre Responsibility is not Strong, Can not Lead by Example. The personnel are paralyzed, and the concept of organizational discipline is weak. In the case of knowing the complicated situation of snow and ice, it is necessary to open a "hero car", drive a fast car, or even in violation of the regulations, there are systems that are not implemented, and illegal vehicles are opened when the road is unclear and the signal is unclear. Some cadres lack responsibility, and the requirements are not strict. They do not have good supervision and leading role, and lead to serious accidents such as crashes, overturns, and deaths.

3.2 The Driver's Basic Movement is Poor, the Operation is Wrong, the Mind is Paralyzed, and There is a Chance of Luck

When the new driver is training for the first time, the action essentials are unskilled, the mind is over-stressed, the pressure is too large, the operation is deformed, the sample is out, and various vehicle accidents are prone to occur. After a period of training, the driver has certain technical experience and level. When the vehicle is used without problems and the training is nearing the end, he feels familiar with the vehicle and the training ground. At this time, the trainer and the trainee may have paralysis thoughts, and the luck will slowly grow. When neglecting to inspect vehicles and implement regulations, it is highly prone to various vehicle accidents.

3.3 Lack of Organization, Poor Planning, Improper Command

Through the analysis of typical accident cases, some major accidents and dangers in the past are often related to the lack of strict organization, incomplete planning, and unreasonable command. All well-prepared, well-organized, well-planned, well-directed teaching and training， after the course is launched, all links are smoothly and systematically organized, and each has its own duties and is in a tight and orderly manner. On the contrary, the instructor will go east and west on the site, and there will always be places that cannot be taken care of, which will lead to accidents.

3.4 Not Aware of Climate, Environment, and Road Conditions, Can't Judge Correctly

In cold regions, the winter temperature is low, the duration is long, the climate is changeable, the physical exertion of personnel is very high, and it is extremely easy to fatigue. If the protection is not in place, it is prone to colds and frostbite, and non-combat reduction is more. Moreover, the visibility in the snow is low, the road is covered by snow and ice, the terrain is complex, and the driver does not pay enough attention to judge the situation correctly, which is easy to cause horizontal slip, drift, collapse, fall into the ice hole, and even rollover accidents.

3.5 Poor Security Awareness, Lack of Mastery of Personnel Thinking, Failure to Detect Hidden Dangers and Improper Handling

Teaching and training of winter ice and snow driving is different from ordinary road driving training. The temperature is low, the snow resistance is large, the viscosity of the oil is large, and the vehicle movement speed is slowed down. The vehicle is overloaded and the fuel consumption is increased. The armored vehicles will have different failure modes than normal temperature. If the driver's safety awareness is not high, the vehicle's technical condition is not always paid attention to, the inspection is not good, the maintenance is not fine, the protection is not in place, the vehicle is very prone to failure, and some faults are sometimes fatal to the vehicles. Some students in the training process have changed their family or have conflicts with others. They have unstable thoughts and emotions, and they are not concentrated. They are easy to drive gambling cars, smashing cars, and driving blind cars. If the faculty members do not find them in time, or even find out without proper disposal, it is easy to induce various vehicle accidents, and the consequences cannot be imagined.

4. Research on Safety Countermeasures of Winter Ice and Snow Driving Teaching and Training in Cold Region

4.1 Detailed Analysis of Safety Factors According to the Teaching and Training process

Taking the teaching and training of winter ice and snow driving process as the main line.According to the three stages before, [3]during and after class, develop a training safety flow chart. According to the point-by-point analysis, systematically study the various influencing factors of teaching and training safety, and make a safe analysis based on the characteristics of teaching and training of winter ice and snow driving. Before the class mobilization, according to the personnel's ideological dynamics of the analysts, do a good job in safety education, [4] so that all staff can be mobilized without leaving a dead end. Pre-class preparation is an important part, focusing on tools, equipment preparation, equipment inspection and site investigation. Based on this, safety training measures and plans are formulated. If any of the conditions are not met, training will not be possible. During the course of the course implementation, we must promptly implement the safety training measures, and we must explain the safety requirements when the subjects are issued. In the process of development, we must also pay attention to operational safety, equipment safety, and dynamic changes of personnel thinking, and always tighten the safety strings. In case of unexpected situations, strictly follow the plan. In the post-class summarization stage, it is necessary to do a safety review and discuss and exchange. If there is a typical safety incident, you can immediately conduct on-site education to form a safety record. In the end, cultivate students' awareness and sense of responsibility for safety and accident prevention, [5]and create a good safety training environment.

4.2 Implement a Clear Division of Responsibilities

To further implement the training safety responsibility system, strengthen the “three-level responsibility” of the supervisors, the directors of the teaching and research section, and the main instructors. The safety responsibility system for training must be strictly implemented in accordance with the principle of “who is in charge of who is responsible, who is responsible, and who is responsible”. [6]The supervisor is the training planner, plays a leading role in organizational training, and establishes a strong sense of safety work for the instructors, and plays an uninterrupted role in supervision and inspection. Leaders of teaching and research departments should often go deep into the teaching site to find problems in a timely manner, solve problems in a specific way, and enable the instructors to have a high degree of understanding of safety work. To firmly establish organizational teaching and training, we must first grasp the ideology of safety and accident prevention. The faculty is the direct commander of the teaching activities and bears the main responsibility for the safety of training. The faculty's words and deeds play an important role. In the implementation, the awareness of "execution is the fighting power" must be strengthened, so that the implementation of safety rules and regulations is truly becoming a habit, a kind of cultivation, a kind of self-consciousness, entering the minds of officers and men, seeing concrete actions, running through all aspects of practical teaching and training, earnestly operating according to procedures, operating according to the security system, and grasping without compromise Good security work is implemented.

4.3 Improve the Training Accountability Investigation System

Closely implementing, investigating and assessing the "three links" must regard teaching and training safety as the primary premise of teaching and training, clear operational procedures, strict safety discipline, and introduce rigid measures. We must find out the root of each accident and even every accident. Really regard the safety of teaching and training as a hard indicator, adhere to the "one-vote veto" system, and earnestly investigate and deal with hardships, do not discount, and find together and deal with them. In assessing accountability, it is necessary to establish a mechanism for investigating responsibility. It is necessary to establish rules and regulations, but also to be strict rewards and punishments. Training safety should be regarded as an important basis for the assessment of the annual team, the selection and appointment of cadres, and the promotion of teachers. The implementation of work performance and safety responsibility is linked. If the teaching and training accidents are caused by poor organization and control, improper implementation of safety protection measures, and improper handling of the machine, the main leaders of the

department, the leaders of the teaching and research section, and the relevant teachers shall be strictly responsible according to law.

4.4 Develop Safety Measures and Plans

While preparing the curriculum implementation plan, the instructors should formulate specific and practical safety and accident prevention measures and plans, which is an indispensable part of teaching and training. When developing safety measures and plans, the instructors must propose specific and feasible safety measures and plans according to the subjects of driving and driving training in the snow and ice, adopting the model, driving site, winter characteristics, weather characteristics and road characteristics. Slogan, avoiding intimidating measures, specific to each link, timing, location and action essentials, so that the relevant personnel can clarify their responsibilities, tasks and specific actions and how to control. The development of safety plans needs to be as detailed as possible [7, 8], and the various safety issues that may arise are considered clearly. When emergencies occur, they can respond quickly and deal with them in a timely manner to minimize accident losses.

4.5 Safety Assessment of Teaching and Training

The teaching safety risk assessment can be implemented according to the prescribed procedures, and the true and objective description of the safety status of the assessment teaching and training is an important measure and guarantee for actively taking the accident prevention from the source and effectively improving the timeliness of safety work. [9, 10] It is usually organized by means of combination of agency evaluation and expert evaluation, qualitative assessment and quantitative assessment, special assessment and comprehensive assessment. The specific methods mainly include assessment test, technical inspection test, qualitative analysis and quantitative analysis. It is mainly to assess whether the organization of ice and snow driving teaching and training is scientific and reasonable, and whether it is possible to generate security risks due to improper organization. The ability of the instructor to command and control, professional quality, safety management and emergency response, and the students' operational skills, safety awareness, ideological and psychological quality and safety risk prevention ability. The influence of factors such as meteorology, geology, topography, surrounding environment and site warning on teaching and training venues. The impact of vehicle performance, safety rate, reliability and other vehicle performance on safety training. The degree of adaptation of the support capabilities and task requirements, such as tool support, equipment support, safety alert, medical rescue and vehicle maintenance, used in teaching and training, and the impact on the safety of teaching and training. Implementing the safety assessment of teaching and training can truly grasp the situation in advance, pre-examine the problem, pre-determine the measures, and pre-exclude hidden dangers, thereby reducing the blindness in security prevention, improving reliability, enhancing work effectiveness, and improving prevention quality.

References

[1] He Wen. On how to correctly handle the relationship between military training and security and accident prevention [J]. Economic and Management research, 2018 (04):

[2] Yanhong Lee. Armored equipment safety and accident prevention [M]. Beijing: Military Yiwen Press, 2012: 1-187.

[3] Ning Geng. Discuss how to strengthen the safety training of firefighting troops in combat training [j]. China Science & Technology Overview, 2017 (04): 168.

[4] Degang Kong. Safety issues and strategies for combat training of firefighting forces [j]. Shanxi Architecture, 2017 vol.43(17): 244.

[5] Chong Lee，Shusheng Shi. Exploration and Enlightenment of US NFPA101 " Life Safety Code " [j].Journal of Capital University of Physical Education and Sports ,2018vol.28（05）：419-422.

[6] Zhengxian Lee. Theoretical Study on the Construction of Security System for Field Survival Training Courses in Colleges and Universities[j]. Journal of Wuhan Institute of Physical Education, 2017vol.41(09):78-80.

[7] Yuanyang Xing, Fan Gang. How to deal with the relationship between military training and safety management [j]. Shanxi Youth, 2018 (1): 243.

[8] Ping Wu; Yunpeng Tang. Research and Formulation of Safety Precautions for Field Survival Training Courses in Colleges and Universities [j]. China Educational Technology and Equipment, 2017(09): 51.

[9] Jiantao Feng, Long Lee. A Brief Discussion on the Risk Assessment of Practical Teaching under Practical Conditions [j]. Armored Corps Officer, 2014 (02) 66-67.

[10] Yawei Wang, Meijia Han. Research on the Safety Guarantee System of College Students' Quality Development Training Courses [j]. China Market, 2018(01): 230-231.