Exploring the Law of Safe Work from Practice
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Abstract. Accidents are characterized by suddenness, danger, and universality. Accidents not only cause casualties and property losses, but also seriously affect the normal work and construction of a unit. Therefore, for a unit with high safety requirements, safe work is always of top priority. To this end, this paper explores the accidents in production, life, teaching and training, then finds the characteristics of safe work. It hopes to provide reference for safety management.

Introduction
Safety has a wide meaning. The definition of it is "no danger; no threat; no accident" in Modern Chinese Dictionary[1]. Different subjects have different contents, requirements and categories for safe work. The accident concerning safety is defined in the literature [1] as "accidental loss or disaster often used for accidental changes in production, work, activities, etc." General Program for System Safety refers to it as one or a series of accidents causing casualties, occupational diseases, equipment or property damage[2]. According to the accident occurrence area, it is divided into industrial production safety accidents, road traffic accidents and fire accidents. According to the casualties and economic losses caused by the accidents, it is divided into general accidents, big accidents, major accidents and special major accidents [3].

The history of the development of human society is actually a history which human beings struggle with the natural world and their competitors. Dating back to the military literature and poetry records in the Spring and Autumn Period, it has been recorded that people dare not use the rule until they are prepared for danger in times of safety, well-prepared in thought and precautious about perils. Peel some mulberry bark and fix the doors and windows before it rains. It reflects the simple and materialistic dialectical safety concept of the ancients and provides scientific guiding ideology for us to carry out safety work. Today, there are still many security issues in our work, life, study and training. To this end, this paper conducts a rough analysis of safety practice cases such as production and life, military training, and explores the law of safe work, hoping to help safety work.

Safe Work Practices
Human being has very rich practices in the prevention of safety accidents and the summarization of lessons learned. This article starts with the production and life, teaching and training practices, explores the characteristics of accidents, and things to do in advance to prevent accidents.

Qu Tu Xi Xin (Prevention is Better than Cure)
The allusion of "qu tu xi xin" is from Qi Tan's "New Theory" of Han Dynasty, which reads: "Chun yukun comes to the neighbor and finds that the chimney is straight and the firewood is on the side. He says there will be a fire, let us bend the chimney and move the firewood away. However, the neighbor doesn't follow and his house is burned. With the neighbors' help, the fire is put out. Then with mutton and liquor, the neighbor treats those who help in the fire without inviting Chu yukun. A man of insight says that the idea of bending the chimney and moving away the firewood is not rewarded, while those in danger become distinguished guests, which is just like putting the cart before the horse." Yu Yuzhen was a politician and thinker of the Qi State during the Warring States
Period. He summed up simple safety laws from daily life. The chimney was straight and there was firewood stacked next to the stove. Both are major hidden dangers of fire. Therefore, the neighbor was advised to remove the firewood and bend the straight chimney. Otherwise, a fire would inevitably occur. The neighbor did not follow his advice, and a fire broke out. The neighbor killed the sheep and thanked other neighbors who helped put out the fire, but refused to invite him. People of insight ridiculed the neighbor: the man advising you in advance to bend the chimney and move away the firewood is not rewarded, while those in danger become distinguished guests, which is really put the cart before the horse! The same is true in the story from *He Guan Zi*, Vol.II. *Shi Xian* Chapter 16. The King of Wei asked Bian Que about the three brothers' medical skills. Bian Que answered, "my eldest brother is the best, my second brother comes next and I am the worst. The reason is that my eldest brother treats a disease before it attacks, so his fame does not spread out of our home. My second brother cures a disease in its early stages. People think he can only cure minor ailments, so his fame only reaches to his native village. As for me, I treat a disease when the condition is serious. Most people think I'm a good doctor because they see me putting a needle through the veins to bleed, casting poison and applying medicine to the skin."

These two allusions, although one stems from the fire prevention of daily life, and another is derived from the comparison of medical skills, the ideas embodied in it are of very important guiding significance for us to carry out safety work! In the first case, the neighbors don't have a strong security awareness and they don't pay much attention to safety work. Because there are not enough lessons, even if someone points out the hidden dangers in advance, they still don't pay attention to them and do not rectify them. The probability of accidents will increase which is just a matter of time. On the contrary, if he has a strong sense of safety and attaches importance to safety work, he will not pile dry firewood beside the stove and make the chimney straight. If he attaches importance to safety work and make adjustments after others' advice, the probability of accidents will decrease. In fact, if one is engaged in safe work, he should follow Chun yukun and Bian Que: discover in advance, prejudge in advance and rectify in advance to prevent precautions, check erroneous ideas at the outset and prevent problems before they occur and smother safety hazards and accidents in the bud. If it is achieved, there is no need to be in my ideological realm and height of understanding. I am willing to be as precautionary as I am without being understood like Chun yukun and be skilled in medicine with "the fame within home" like Bian Que' eldest brother.

**Machining**

US security engineer Heinrich counts 550,000 mechanical accidents, including death and serious injury. There were 1666 accidents and 48334 minor injuries, and the rest were no injuries. Based on this, he concluded that the proportion of deaths and serious injuries, minor injuries, and no injuries in mechanical accidents is 1:29:300, as shown in Fig. 1. Internationally, this law is called the law of accidents or the law of Heinrich [4].

The Heinrich rule is based on the statistical analysis of the statistical data after the occurrence of the mechanical accident. It has posteriori and statistical characteristics, emphasizing the cumulative characteristics of the accident, that is, the accident will not occur without warning, and there must be many omens and hidden dangers in the early stage of the accident, which contains the philosophical principle of quantitative changes leading to qualitative changes, so large accidents are caused by the accumulation of small accidents. The law warns us to learn to sum up and analyze in the safety management work. If a unit always has various kinds of light injuries or no harm accidents, the safety management personnel must raise awareness, see small clue and plan ahead. Find more signs of accidents from the small hidden dangers, conduct investigations and rectifications to eliminate potential safety hazards, reduce the risk of accidents or minimize losses even if accidents occur.
Military Training

Today, we all know that when the troops cross the bridge, it is stipulated that they change the neat pace to a step. The rule is from a lesson of blood: in the middle of the eighteenth century in Angers, France, a group of soldiers under the command of the commander took a neat step, passing over a span of 102 meters, and the bridge suddenly was broken, 226 people, including pedestrians, were killed or injured. The investigation shows that it is precisely because the vibration frequency generated by the troops when they are neatly traveling is close to the natural frequency of the bridge, so that resonance occurs (see Fig. 2), causing major casualties in the collapse of the bridge. So there are the above regulations.

Looking back hundreds of years later, the US military, the world's most strictly trained and experienced military, has a good reference to our training. In the four years before and after the Gulf War, the US military killed 4,666 people in various similar combat trainings, and only 174 people died in the wars including the Gulf War [4]; in 2017, according to *Washington Post*, in the past three years, there were 185 non-combat deaths in the US military and 44 deaths in combat. In addition, other US media statistics show that in the past seven years, various flight ground personnel of the US military have injured more than 1,000 people for various reasons, and the damage caused by the enemy on the battlefield is 83 people. Analysis of the above data reveals that during the Gulf War, the proportion of deaths in war was only about 1/27 of the usual training. In the first three years before 2017, the number of American combat deaths was only 1/4 of the number of non-combat deaths. It is only 1/12 [5].

Dialectically analyzing the above data, it can be seen that although the usual strict training may bring about a large number of casualties, it can get better benefits in actual combat, with fewer casualties and less equipment losses. And this benefit comes from the usual rigorous training or the cost of training accidents and blood. In other words, if there is no usual training that is difficult, strict, and practical, it will not be possible to achieve such good results in actual combat. Therefore, if the safety work manager, especially the lesson training safety manager, uses a dialectical thinking and a systematic point of view to look at safety work, fully learns lessons from accidents and failures, and improve the guidance of safety work, it can be carried out better.

Conclusion

Working safely requires a high degree of attention to people's work. All accident statistics show that more than 90% of accidents are inseparable from human factors, and unsafe human behaviors are the most important subjective factors that cause safety accidents[6]. Therefore, in safety management, links, equipment, site inspections, hidden danger investigations, etc. involving safety work are inseparable from people. Therefore, the first priority is to educate key personnel to ensure the implementation of key positions, key links, and important personnel.
Safe work requires the thought of taking precautions. Numerous accidents indicate that there are omens or signs of hidden dangers before the accident. Therefore, it is necessary to think ahead, check in advance, dispose of them in advance, plan ahead, take preventive measures, and implement rules and regulations in a solid manner to ensure that they are prevented. Safe work requires a dialectical understanding. "Misfortune is a blessing in disguise; Happiness comes from misfortune." Accidents are not necessarily bad things. If we can find the characteristics that are good for accident prevention, form empirical practices, rules and regulations and turn failure into success so as to provide guidance and assistance for follow-up safety work. Therefore, it seems that an accident might be a good thing.

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