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A Study on China's Safety Management with New Energy Automobiles as an Opportunity

- Pay attention to the construction and improvement of public safety management in China

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A B S T R A C T

In recent years, with the continuous enhancement of environmental protection awareness, new energy vehicles have become more and more understood and recognized by the public, and related safety issues have also entered the public's field of vision. The huge risk factors brought by new energy vehicles and the possibility of accidents threatening safety will become one of the tasks that cannot be ignored in crisis management research projects. Safety management is an important part of the crisis management system and plays an important role in real life, such as personal safety, social stability, and stable development of enterprises. Although this study cannot completely eliminate the potential risk factors and accidents of new energy vehicles, through the analysis and introduction of risk factors and the concept of safety management, the possibility of avoiding accidents can be improved and the response time of emergencies can be optimized. Prepare in advance for a future-oriented society.

Key words: safety; safety management; initiative; cooperative network

1. Introduction

New energy vehicles are a new type of environmentally friendly transportation, and their applications are becoming more and more extensive. With the country's high attention and the introduction of relevant policies, new energy vehicles have developed rapidly in the Chinese auto market, and have also become the main choice for many consumers to buy cars. It is expected that the global market share of new energy vehicles will continue to grow, and at the same time, the safety issues of new energy vehicles have entered the public eye according to the type of accident. According to the type of accident, car (battery) spontaneous combustion, poor braking, intelligent system failure (autonomous driving), sudden accidents, etc., most of the fire accidents are caused by the spontaneous combustion of batteries.

According to the fire situation of new energy vehicles in the first quarter of 2022 announced by the National Emergency Management Center of China, the number of new energy vehicle fires in my country in the first quarter was 640, a year-on-year increase of 32%, higher than the average of traffic fires (8.8%), equivalent to More than 7 fire accidents are caused by new energy vehicles every day. Looking at the numbers alone, the probability of accidents of new energy vehicles is much lower than that of fuel vehicles, but as the market coverage of new energy vehicles continues to increase in the future, the probability of such accidents will also increase.

1.2. Safety management

Safety management can not only create safety effects through mandatory intervention on specific objects, but also safely integrate new objects into the current environment through review, analysis, and research without affecting the current living environment and social status. Through a series of scientific and reasonable safety management measures, without affecting the normal development of the new energy vehicle industry, we can immediately grasp the potential risk factors of new energy vehicles, reduce the possibility of accidents, and ensure the safety of life and social environment.

2. Materials and Methods

Based on the literature review, this study investigates the security threat factors of new energy vehicles at the current stage, in order to achieve the research purpose set in the preface. The data for the literature study includes government-published data, local government survey results and reports, newspapers, academic journals, and academic papers.

With the continuous discussion of new energy vehicle safety accidents, the safety issues of new energy vehicles have also been raised. This is because once an accident occurs, it may endanger the safety of life and property in the car, and even endanger social stability. It has a wide-ranging impact on individuals, families, businesses, societies and governments.

Although this study cannot completely eliminate the potential risk factors and accidents of new energy vehicles, it is possible to avoid accidents as much as possible by introducing the analysis and research of the concept of safety management and reducing the reaction time.

3. Theoretical Investigation

3.1. Safety management

"Safe" is defined as a risk that is judged to be no more than acceptable limits as defined by Harvard Professor Rosens. Safety and risk are relative concepts. It is a comprehensive perception of health and casualties in production and life. Safety refers to the state of no risk and no accident. However, nothing in the world is absolutely safe, and there are unsafe factors in everything, so there are risks, which makes safety a relative concept. That is, safety is a relative concept of risk, and the characteristic of risk is the degree of dependence on safety. If the risk is below a certain level, it is considered safe. Risk (A) becomes a degree of reliance on safety (B), a bilateral benefit. A+B = 1, such as 3% risk and 97% safety, that is safety.

"Safety management" is carried out to increase productivity and reduce losses caused by disasters, and is to keep safety accidents that are inefficient factors in a state of non-occurrence, that is, activities to protect human life and property from disasters. It refers to all planned and systematic activities.

"Safety is called accident prevention, and accident prevention is the science and technology that controls the relationship between the physical environment and man-machine" (H.W. Heinrich), the premise is the input and scientific application of safety management concepts. Broadly speaking, safety is defined as the absence of harm or danger. Safety management can be applied in many highly regulated industries such as automotive, aviation, petroleum, medical, workplace and food quality.

A Safety Management System (SMS) is defined as an organization-wide process designed to manage workplace safety risks. A security management system can be tailored to suit any business type or industry sector.

Semi-effective SMS process and procedures:

(a) determine the Organization's approach to risk management;

(b) identify workplace hazards and implement appropriate controls;

(c) Solve communication problems throughout the organization;

(d) include a process for identifying and correcting nonconformities;

(e) Including continuous improvement process

In the past, the concept of safety management has been widely used in enterprises, production, construction and other links, making it more difficult for the public to understand and understand safety management. In fact, the central and local governments are the core of national and social security management. The security management at the government level has a wider scope than the aforementioned security management, the public group is larger, and the impact is more serious. It's called Public Safety Administration.

Public safety management relies on a variety of services to provide safety and security for the public in their daily lives. These services are usually operated by local, provincial, municipal or central government agencies. Public safety management professionals ensure that these services operate efficiently and orderly and meet safety needs.

Public safety management includes coordinating and managing the resources that provide safety and security to social communities. Typically, jobs in this field include government departments, police, fire and emergency medical services. Managing these services requires strategic planning, preparation phase, inter-agency coordination and financial management skills. Therefore, it is very important to train and educate experts in public safety management.

3.2. Initiative and Passivity

Security management is a complex systems process as complex as any other course being taught. That is to say, safety management is a subject that can comprehensively sort out the contents of various departments. Considering the complexity of the safety management implementation process, it can be directly divided into two parts from the perspective of direct or indirect participation in the safety management system, and active and passive participation in safety management to analyze the rationality of the process.

From an analytical point of view, the executives and supervisors of the safety management system are the main body and target unit of the system. The

active and passive characteristics of the two are mainly manifested in the form of expression and subjective relationship.

The initiative and passivity of the prevention stage is not only reflected in the initiative and passivity of the managers for accident prevention, but also in the initiative and passivity of the managers in accident prevention. Supervisors can be judged on their own safety awareness and level of safety education, not managers by the same criteria. This is because safety awareness and clear accident prevention preparation are essential professional skills for a qualified safety manager. Managers should evaluate the active working attitude or passive working attitude adopted in the accident prevention stage.

Preparatory work for prevention and control operations in advance is a positive step. In other words, by taking effective preventive and control measures before an accident occurs, the likelihood of an accident is reduced and the likelihood of an accident spreading to surrounding areas is predicted. Passive, on the other hand, can be interpreted as the supplementary and restorative measures taken by managers after an unavoidable accident. Due to its reactive nature, the fact that it is a follow-up measure further demonstrates the importance of actively participating in the safety management process. Since passivity exists even after an accident, it is necessary to reduce unnecessary damage by emphasizing and stressing one's own activities, rather than risking physical threats, health effects, and financial loss after an accident.

When the supervisor has a high level of safety awareness in the entire safety management process, there will be enough activity in the process to develop more favorable preventive measures for unpredictable or sudden accidents at the level of the supervisor's subjective awareness. As a professional manager, you need to apply your professional knowledge and superb professional knowledge throughout the entire safety management system. The overall safety risk prediction and safety early warning are very important in the safety management process.

According to the analysis results of many fact cases, the most likely to affect the entire safety management system is passivity, and passivity means the risk and backwardness of the management system. In fact, what people hate most about dealing with is the compensation process after an accident. If most of the passive features in the safety management system exist, it is very unfavorable for the long-term operation and development of the entire safety management system, and the feasibility of the existence of this system needs to be considered.

In the context that we are now in the post-epidemic era, and various industries are constantly recovering according to national policies, the importance of predictability and safety is of course self-evident. By improving the active awareness of safety management, relevant government departments can more easily find early warning measures and safety factors in the complex safety management system, effectively solve safety problems in supervisory activities, and reduce accidents by maintaining safety management. Always maintain a high safety posture during the activity. Of course, in the process, both are important components of a safety management system and require good communication to ensure that the system remains in the ideal state of a sustainable virtuous circle.

3.3. Cooperative Network

In many new energy vehicle accident reports, battery fire accidents account for more than 70%, and as the internal density of power batteries continues to increase, the destructive power that can cause fires also increases exponentially. Doubts about technological development, fear of accidents, and frequent avoidance of related companies may all become risk factors in the process of restructuring the safety management system.

The spontaneous combustion of the car battery is caused by the high temperature during driving or other reasons, and the second is the spontaneous combustion of the electric vehicle when charging, and the latter is more likely to cause spontaneous combustion in a large area. According to statistics, there are currently about 2.8 million personal new energy private cars and about 866,000 new energy vehicle battery charging facilities in China. These two figures will further increase in the future according to changes in demand. It is foreseeable that fire hazards will become more and more distant from our lives. the closer.

Two concepts of emergency evacuation time need to be mentioned here. One is ASET (Available Safe Exit Time - Allowed Evacuation Time) and the other is RSET (Required Safe Exit Time - Total Evacuation Time).

ASET (Available Safe Escape Time) is the time that elapses after a fire before it becomes unsustainable in the presence of smoke, heat and toxic gases.

(ASET=RSET+FREE TIME/FLASH OVER)

When calculating a fire ASET, firefighters first create a design fire. This is done by taking into account a number of relevant modification factors, including building materials and relative quantities/yields of combustion products (toxic gases, heat and soot, ceiling heights, geometry of fire spaces, physical barriers and smoke ventilation systems, etc.).

Enter the design fire details into a fire modeling tool or other applicable computational tool to estimate the time it will take for conditions within the space to become unsustainable after the fire begins.

RSET (REQUIRED SAFETY EGRESS TIME) refers to the time required for the safe evacuation of people in a building after a fire signal. RSET is calculated as the sum of three separate components: Alert Time, Evacuation Delay/Pre-Travel Time, and Travel Time.

It can be seen that the reaction time and evacuation time required for individual evacuation after a fire is longer than expected, and many factors need to be considered. In the event of a fire, it is necessary to seize the "golden time" and use the emergency evacuation knowledge learned at ordinary times to escape the danger.

As mentioned many times in the preface, initiative is an important prerequisite for safety management. If managers always take initiative as the first element of accidents, the probability of disasters will also be reduced. I think it is necessary to establish a multi-departmental information sharing and data analysis network to discover risks or unsafe factors in advance, so that management departments can manage and control risks in a timely manner, and greatly reduce the impact of new energy vehicle safety risks on society. Even if an accident occurs, emergency measures can be initiated in a timely manner through the multi-departmental collaboration network, which greatly improves the inter-departmental work interoperability and reduces unnecessary reaction time. Through this network in the later stage, it is possible to discover exposed problems, collect on-site feedback, inspect companies whose quality is not up to standard, and regularly disclose the collected real-time information to the public.

To sum up, if a multi-departmental collaboration network is established, the safety management system can operate for a long time, and the problems existing in the safety management system can be discovered at the first time, which is conducive to the communication between managers and managers. Immediate feedback allows managers to conduct self-assessments and increase safety awareness.

4. Improvement plan and implications

In the current environment (post-pandemic era), strengthening safety management awareness is considered to be the most important, and the cultivation of this awareness often takes into account current and future unpredictable risk factors. The establishment and supplementation of the safety management system is by no means one-sided. The joint establishment of the manager and the subordinate to strengthen the communication, understanding and respect between the two parties is the beginning of the establishment of a harmonious order system.

The next step is to establish a new energy vehicle safety accident report and real-time publicity system, joint investigations of safety management related ministries, companies, accident causes, actual situation investigation results, and specific models to be publicized in a timely manner.

Focus on strengthening the construction of collaborative network, share data with competent departments of various industries, and identify risk trends and risk factors through real-time information transmission.

In response to the spontaneous combustion of batteries, the safety management system should strengthen the safety inspection of new energy vehicle parking lots (including private parking lots and public parking lots) and charging stations.

The screening standards for new energy vehicles need to be improved, especially the inspection of easily worn parts in the car.

It is necessary to improve my country's annual automobile inspection and automobile maintenance system, and improve the new energy vehicle quality and safety assurance system of annual inspection/maintenance + AI real-time monitoring through data transmission.

In addition, the safety management department and relevant enterprises jointly set up a safety team to provide more professional safety guidance and regular training for new and old vehicle users.

Finally, I believe that in response to the special situation of spontaneous combustion of new energy vehicle batteries, my country's Fire Protection Law should self-check and supplement legal provisions, strengthen the control of power batteries, and ensure that all users (drivers) are protected by law.

5. Conclusion

In fact, it is a very difficult and arduous task to timely capture the risk factors that may exist in the future society. The purpose of selecting NEVs to review this article and research is inspired by the content of safety management training courses. As a developing country, China currently pays more attention to the follow-up stage of new energy vehicle accidents than to the stage of accident prevention, which seriously hinders the safe transition to an advanced country and a future-oriented society.

In today's society, various departments are int erconnected to form a new integrated departmen t, especially between management departments. I ntersections at work are not easy to spot all the time. In the past, the way of work between sup eriors and subordinates was often one-sided, that is, managers and those in charge. This simple working method suffers from the serious disadv antage of inconsistent information exchange. Th

erefore, by forming a collaborative network of v arious levels or departments, it is easy to break through these fixed ideas and maximize the mot ivation of managers. The exchange of data over a network mainly facilitates efficient processing of data. Specifically, what I think is reflected in reality is the accident prevention and post-proc essing steps of safety management. Of course, t he professional self-discipline and self-examinati on of workers in the network are essential.

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Profile

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