

Study on status of gas pipeline safety management in Jiangmen City in China

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Abstract: With the rapid development of China's economy and the vigorous advancement of urbanization, the use of gas as a clean and environmentally friendly energy source is increasing year by year. At the same time, the safety of urban pipeline gas has become increasingly prominent. Through research, it is found that the main reasons for the application of urban gas are: brutal construction of construction units, occupational pressure pipelines for residents, corrosion of pipelines, and aging of gas stoves for residents. In response to the above problems, Jiangmen China Resources Gas Co., Ltd. has explored and developed an effective operation of the city gas safety management system, namely the maintenance of gas pipeline safety and safety risk monitoring, the combination of government policies and corporate supervision, and a risk prevention and early warning system. Through the active cooperation of all departments, the city gas can operate safely and effectively.

Keywords: city gas; safety risk; gas safety management; pipeline gas

Urban gas pipeline networks are an important part of urban infrastructure and urban energy supply. The pipeline gas has developed rapidly due to its characteristics of cleanliness, environmental protection and safety. It has played an important role in improving the atmospheric environment and improving the living standards of residents. However, the characteristics of flammable, explosive and toxic gas in towns and the generality, suddenness, unpredictability, large-scale impact and serious consequences of gas leakage are highly prone to poisoning if used or improperly protected. Vicious accidents such as fires and explosions, causing loss of personnel, property and other negative effects ^[1-2].

Under the great attention of the Jiangmen Municipal Committee, the Municipal Government and the Housing and Construction Bureau, Jiangmen China Resources Gas Co., Ltd. has made continuous efforts to improve the gas safety management level after many years of efforts. The Jiangmen area has never experienced casualties due to pipeline gas leakage. Accidents and property losses are also strictly controlled at very low levels.

This paper summarizes the problems that have been achieved in the process of safe gas use and the improvement of gas use safety level in Jiangmen City, and discusses how to further improve the safety of urban gas and avoid accidents in gas application process. Provide scientific basis for safe and reliable application of city gas.

1 The overall situation of gas in Jiangmen City

As early as 2008, when Jiangmen City introduced China Resources Gas as a pipeline gas franchise enterprise, Jiangmen City had a pipeline to use liquefied petroleum gas, which has been more than 15 years.

With the increasing number of users, the demand for natural gas is also increasing, but the service life of the pipe network is also getting longer and longer, the hidden dangers of the pipe network are becoming more and more complicated, the difficulty of enterprise safety management is increasing, and some hidden dangers are gradually becoming prominent. Hidden dangers are

mainly reflected in the following aspects:

(1) The illegal building is occupied by pressure and surrounding natural gas pipeline facilities; During the safety inspection, the inspectors of the gas company found that some resident users built illegal buildings and occupied natural gas pipelines, which was very likely to cause damage to the pipelines, which led to leakage of gas pipelines.

(2) Damage to natural gas pipeline facilities during construction;

At present, Jiangmen City is in the period of urban construction, and many areas will undergo demolition and reconstruction. However, there are also some problems. Many construction sites are intersected with gas pipelines, and some construction teams pay more attention to the construction period, while neglecting safety issues, often assaulting construction, nighttime construction, and not considering underground pipeline safety issues, giving gas pipelines There has been a great potential safety hazard. The accident of gas pipeline leakage caused by third-party construction has occurred. In my large and medium-sized cities, there are such accidents every three days, which not only causes a large amount of resources. Wasted, but also caused a certain degree of economic losses to major gas companies.

(3) The pipe network is aging, and the transformation cost is high.

Due to some historical reasons, the construction of gas pipelines in Jiangmen area is mostly carried out by pipe jacking, and the pipe jacking construction accounts for about 90% of the total. In the short-term, the pipe jacking construction has the advantages of short construction period and small workload. However, the pipe jacking construction is prone to deviation of the underground pipeline, and once it is damaged by a third party, it is difficult to repair and can only be re-piped. Moreover, the completion drawings and materials of the construction of the pipe jacking do not match the site, and the PE pipe is difficult to detect the accurate pipe position. The underground gas pipelines are also seriously corroded due to long-term storage and humid environment. Many pipelines have exceeded their service life, which also increases the risk of gas leakage in buried pipelines.

(4) Single source of gas, safety of gas source

Natural gas, liquefied petroleum gas, coal-to-gas, etc. are several gas sources frequently used by urban gas companies^[2]. Currently, pipeline natural gas is the main source of gas in Pengjiang District, Jianghai District and Xinhui District of Jiangmen City. High, Kaiping, Heshan pipeline natural gas development is faster, Taishan, Enping pipeline natural gas use less, residents use liquefied petroleum gas, the industry mostly uses coal or artificial gas, neither environmental protection nor safety, pipeline gas also have a lot of room for development.

2 Precautions to ensure gas safety applications

The safe and stable operation of the gas pipeline network is a key issue for the work of Jiangmen China Resources Gas Company. Focus on preventing damage to gas pipelines by third-party construction, enhancing the safety awareness of the construction party, increasing the main responsibility of the gas company, and emphasizing the supervision of government departments. For the safe use of gas, we propose the following measures.

(1) Establish security mechanisms and implement corporate responsibility

The establishment of a security mechanism lies in the management of the enterprise and the responsibility of each person. The core of gas safety management is prevention. Only by doing preventive management work in the early stage can the risk of danger be greatly reduced; effective control is the key to gas safety management; In addition, improving the intrinsic safety of enterprises is the basic requirement, that is, achieving safety and reliability in three aspects of people, things and systems^[3-5].

The implementation of corporate responsibility lies in the implementation of corporate responsibility. First of all, the enterprise security management level strengthens the management step by step, and should also establish a long-term mechanism for the safe operation and

management of urban gas enterprises, in order to better implement the main responsibility of the enterprise. Therefore, all departments must do their own work, the enterprise safety production committee should do a good job in decision-making, safety production management functions should be coordinated and supervised, all grassroots units must do a good job, and every production team should do daily safety. Management work is necessary to regularly carry out safety education and pre-job training for all positions, so that no employee has certain safety skills and strengthens the safe operation of gas supply facilities to ensure the safety of urban gas pipeline network facilities. Reliable and smooth operation is needed^[6].

Town gas enterprises should increase customer safety propaganda, enhance users' safety awareness, improve users' safety skills, and establish a concept of "safety and safety for supply and use". Everyone can attach great importance to safety and achieve four treasures: The security system of insurance, co-insurance, self-insurance and mutual insurance ensures the safety of gas supply.

(2) Safety construction of gas supply security system to enhance urban gas supply

The natural gas supply of CNOOC is the main source of gas sources in Jiangmen Town, and the gas source is relatively single. Once the gas is shut down for any reason, pipeline gas users in Jiangmen area will have no gas available. Therefore, enterprises should seek a new source of gas in peace of mind and establish a supply system for the main gas source supply of urban gas. After years of development, Jiangmen Natural Gas Pipeline has the characteristics of complete types, large quantities, and large gas consumption. Therefore, it also brings about a heavy burden of gas supply emergency reserve and support capacity building. In order to meet the increasingly tight natural gas demand in Jiangmen, it is necessary to put the construction of emergency gas source protection on the agenda, and it is necessary to step up implementation.

(3) Equipped with registered security engineers to encourage employees in all positions of the company to learn and obtain registered security engineers

Encourage employees to learn safety knowledge and set up an incentive mechanism for employees to obtain registered safety engineers and put them into work, to teach users the safe use of gas knowledge, to check gas safety, to impart safety knowledge, and to improve the quality of security and security screening of households. Reduce the incidence of gas accidents and timely rectify existing safety hazards. Establish a sound gas safety facility and environmental archives for special gas-use sites, and sign the "Supply Gas Safety Agreement" to reduce the risk of hidden dangers.

(4) Enhance emergency treatment measures and enhance investment in science and technology

In terms of improving emergency response measures, it is necessary to strictly implement the regulations on the management of emergency duty, and also strengthen the emergency management of emergency rescue and the sense of responsibility and responsibility of the rescue personnel, so that "sounds must be robbed, police must be out, time is wrong, and it is strictly forbidden to push" The four requirements require political sensitivity. During major events, conferences, and events, the state will enhance awareness of safety and prevention, increase the prevention of accidents, and eliminate safety hazards to a minimum.

Science and technology are the primary productive forces. Urban gas-fired enterprises must ensure the safe and stable operation of enterprises with first-class technical equipment, advanced management techniques and high-quality employees. Scientifically construct SCADA system: automatic dispatching and dispatching network monitoring and control system; and improve the safety and reliability of gas facilities; use "two-way voltage regulator" for routine maintenance; when fault repair is required, use the auxiliary road for gas supply^[7-8].

(5) Strengthen communication with relevant departments

Jiangmen China Resources Gas Co., Ltd. actively communicates with relevant departments such as the Municipal Housing and Construction Bureau, starts with the source of the problem, and actively cooperates with third-party construction units to find the best methods and recommendations for

underground gas pipeline protection. Through repeated communication with the government, the government departments attach great importance to the safety proposals put forward by our company. In response to the protection of underground gas pipelines under construction, a letter was sent to other government departments, and specific requirements were put forward.

(6) Deep tapping potential and innovative control mechanism.

1) Establish a system of regulations and improve the management system

The company has compiled the corresponding "Deficion Prevention Work Diagram for Third-Party Construction Destruction" and the "Special Rules for Preventing Third-Party Construction Destruction" and other rules and regulations for supervision and evaluation, etc., and provide a good basis for the safe and orderly work of some work.

2) Build a "three-person two-piece" inspection mechanism

According to the administrative level of Jiangmen City and the pressure level of the gas pipeline network, the company proposed a "three-person two-piece" inspection mechanism. The so-called three-person value is the three employees of our company who are responsible for inspecting the two areas. The 365 areas have no gaps, and the construction information is found faster and timelier, and the company reports to the company at the first time. In order to better prevent the work, Jiangmen China Resources Gas Co., Ltd. will conduct the inspection cycle as an urban and construction site for inspection once a day; the courtyard should be inspected once every half month. It is ahead of other large and medium-sized cities in China in the inspection cycle and the length of the staff's daily inspection pipeline.

3) Establish monitoring and on-site management mechanism

The company's patrol personnel inspected the area according to the set inspection mechanism, contacted the construction unit of the area, understood the construction scope, construction progress, and informed the construction personnel of the location information of the gas pipeline in the construction area, and timely obtained the construction information around the gas pipeline. . Paste and plant the gas facility warning sign on the construction site, and communicate with the construction party every day, actively cooperate with the construction party until the end of the construction to jointly prevent accidents.

4) Establish community collaboration mechanisms

Establishing a community collaboration mechanism is to establish systematic contact with some departments such as residential property and key units, so that the community property reports to the gas company at the first time, greatly reducing communication and discovery time, and timely tracking and processing, to achieve group visit group management effect.

5) Strengthen multi-level assessment mechanism

The company set up a "third-party construction supervision and supervision assessment" working group to prevent external damage to the pipeline, make full use of the intelligent inspection system, form a multi-level assessment mechanism, and conduct real-time monitoring of the on-site situation of the inspection line and guardians through multi-level assessment. . Among them, the assessment mechanism includes company-level, department-level, and brigade-level.

6) Improve the plan and strengthen emergency management

The company has built an emergency plan system consisting of one overall plan, 24 special plans and 32 on-site disposal plans. On the basis of the old version of the emergency plan, the text version of the on-site disposal plan will be converted into a map-based on-site disposal plan through pictures and flow charts, which will more intuitively and vividly describe the on-site disposal procedures, so that employees can master the emergency treatment. program.

In recent years, Jiangmen China Resources Gas Co., Ltd. has organized joint emergency drills with relevant government departments, including urban gas third-party damage emergency handling drills, natural gas integrated station tank root valve leakage joint emergency drills, customer service center terrorist attack drills, etc. Enhance the company's ability to respond to sudden gas accidents,

disposal capabilities and collaboration capabilities between departments. By continuously pulling the drills, it provides an opportunity for employees to better understand and master emergency procedures.

(8) Enhance safety promotion

Enhancing safety propaganda and improving the safety awareness of the citizens' gas pipeline network can also greatly reduce the occurrence of accidents. The activities adopted include: organizing community cultural activities to carry out safety publicity, distributing safety brochures, and distributing convenient contact cards to elderly people.

3 initial results

The company reduced the third-party damage index of the 100-kilometer pipe network in 2017 from 1.77 in 2007 to 0.84 by carrying out safety knowledge publicity, increasing investment in pipe network technology and strengthening staff inspections.

4 Conclusion

The article introduces the potential risks of the gas pipeline network in Jiangmen area, as well as the corresponding treatment measures, emphasizing the principle of prevention and serious governance. However, if the gas pipeline network is damaged by a third party, it cannot be achieved only by the gas company. It is necessary to cooperate with various functional departments to better prevent the occurrence of third-party damage and ensure the safe and reliable operation of the city gas pipeline network.

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