

Under the background of 100 million tons of crude oil purchase and sale contract: countermeasures for smooth operation of the Alashankou-Dushanzi-Urumqi crude oil pipeline

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Abstract: A 100 million ton crude oil purchases and sale contract signed between China and Russia, and the crude oil will pass through Kazakhstan and flow along the Alashankou-Dushanzi-Urumchi crude oil pipeline to western Region. As an important crude oil import channel, this paper analyzes the current situation of Alashankou-Dushanzi-Urumchi crude oil pipeline and puts forward some countermeasures. Both Russia and Kazakhstan are major crude oil exporters, with internal demand for exporting crude oil to China. There is a huge gap between domestic crude oil demand, and social and economic development depends on crude oil import. The geographical environment of the crude oil pipeline is conducive to pipeline protection. The security environment of Xinjiang has improved. The situation in Russia and Ukraine and the civil strife in Kazakhstan have limited impact on the pipeline which will have good development opportunities. Thus, this paper proposes the following management strategies. First of all, strengthen communication and coordination between upstream and downstream enterprises. Second, reduce cost and increase efficiency. Third, attach importance of the application of new technologies. Fourth, establish emergency plans and hold emergency drills for emergencies such as COVID-19 outbreak and pipeline leakage. Fifth, strengthen anti-terrorism and riot control. Sixth, strengthen corporate culture and talent team construction.

1 Foreword

On the afternoon of February 4, 2022, The Chinese President Xi Jinping held talks with Russian President Putin at the Diaoyutai State Guesthouse in Beijing, the two sides issued "Joint Statement of the People's Republic of China and the Russian Federation on International Relations and Global Sustainable Development in the New Era"^[1]. China and Russia will work to improve the quality and efficiency of economic cooperation among SCO member states, continue to strengthen cooperation among member states in the field of energy. Within this framework, the two countries signed about 20 cooperation documents covering energy and other fields, which include the Supplement 3 to the "Crude Oil Purchase and Sale Contract to Supply Oil to Refineries in Western China" signed by Petrochina and Rosneft. Under the agreement, Rosneft will transit through Kazakhstan to supply China with 100m tonnes of crude oil over a 10-year period. The crude oil will enter China through the Alashankou terminal of the China-Kazakhstan crude oil Pipeline and transport to Dushanzi Petrochemical, Urumqi Petrochemical and Wangjiagou Oil Depot by the Alashankou-Dushanzi-Urumqi Crude Oil Pipeline. Refineries in the northwest will be tasked with processing crude oil to meet China's demand for petrochemical products^[2].

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The total length of the 477 km Alashankou-Dushanzi-Urumqi Crude Oil Pipeline include the Alashankou-Dushanzi Crude oil pipeline and the Dushanzi-Urumqi crude oil pipeline. The whole line equipped with 4 process stations, 16 oil pump, 9 heating furnaces and 17 line valve rooms. The total length of Alashankou-Dushanzi crude oil pipeline are 246 kilometers, with a diameter of 813 mm and a design pressure of 6.3MPa. The first phase of the project completed and put into operation on December 16, 2005, with a transport capacity of 10 million tons per year; the second phase of the project completed in July 2012, with a pipeline transmission capacity of 20 million tons/year. During this period, three stations (Alashankou Pump Station, Tuotuo Intermediate Pump Station and Dushanzi Station) were rebuilt and expanded, among which Tuotuo Intermediate Station expanded into a pump station. With a total length of 231 kilometers and a diameter of 610 mms, the Dushanzi-Urumqi crude oil pipeline has a designed pressure in 8-12Mpa and a designed transport capacity of 10 million tons per year. According to the physical properties of the oil from the upstream pipeline, the Alashankou-Dushanzi crude oil pipeline adopts the airtight transportation process that combines normal temperature and heating treatment. Part of the crude oil transported in Dushanzi intermediate station, and the remaining crude oil transported to Urumqi by the Dushanzi-Urumqi crude oil pipeline.

The upstream of the pipeline are the China-Kazakhstan crude oil Pipeline, which is the main channel for transporting crude oil from Kazakhstan to China. The China-Kazakhstan crude oil pipeline includes two sections: Atrao-Atasu and Atlas-Alashankou Pass. Among them, Atrao-Atasu crude oil pipeline transports Kazakhstan crude oil (referred to as Kazakhstan oil), Atasu-Alashankou crude oil pipeline transports the mixture of Kazakhstan oil and Russian crude oil (referred to as Russia oil), and the two kinds of crude oil mixed in Atasu station and then transported to Alashankou Station. The Atasu-Alashankou crude oil pipeline was completed in 2005 and started production of July 20, 2006. With a designed capacity of 20 million tons per year and a designed pressure on 6.3MPa, the pipeline has a total length of 965 kilometers and a diameter of 813 mms, and transported 10.95 million tons of crude oil to China in 2021^[3].

The Alashankou-Dushanzi-Urumqi crude oil pipeline passes through the central and western regions of Xinjiang, transporting crude oil from Russia and Kazakhstan to China. It is an important channel for the import of western crude oil and has an important strategic position. Yet, the situation change in Russia and Ukraine, the civil unrest in Kazakhstan, regional terrorism and other unstable factors have formed potential threats to the smooth operation of the Alashankou-Dushanzi-Urumqi crude oil pipeline. This paper analyzes the international situation, domestic environment and safety environment of the pipeline and puts forward countermeasures^[4].

2 Analysis of development status

2.1 China-Russia cooperation

Crude oil exports are one of Russia's most important sources of revenue. According to the Analysis of Russia's new Energy Strategy Before 2035, It expected that Russia's crude oil exports to the Asia-Pacific region will double in 2035, and 32% of Russia's crude oil production will export to the Asia-Pacific region^[5]. As the oil source of China-Kazakhstan crude oil pipeline, the output of West Siberian oilfield in Russia plans to reach 304.6 million tons in 2030, with enough oil source^[5]. The China-Kazakhstan crude oil pipeline shoulders the important task of Russian oil to export. The Russian government and energy department attached great importance of the management of crude oil exported and the pipeline to reduce the negative impact on external environment on the normal operation of crude oil pipeline^[6]. China's steady development has brought economic and political advantages to Russia's energy exports, enabling Russia to resist external risks and gain space for steady development^[5]. At the same time, China's economic size and development speed play a stable role in boosting Russia's development.

In 2021, China and Russia issued a joint statement on the 20th anniversary of the signing of the China-Russia Treaty of Good-neighborliness, Friendship and

Cooperation, called for the two sides to strengthen strategic and comprehensive energy cooperation^[7]. Strengthening energy cooperation with China is a good opportunity for Russia to improve its geographical environment and social development. Crude oil, as an important energy source, is the focus on energy cooperation between China and Russia. China's crude oil consumption is dependent on imports, and China and Russia are complementary in the field of crude oil, so the cooperation between the two countries in crude oil is win-win. Strengthening China-Russia cooperation and enhancing crude oil to import channels will play a positive role in the social and economic development of both countries. Under the long-term supply contract for China and Russia, part of Russian crude oil to enter Xinjiang through the Atasu-Alashankou crude oil pipeline, which protected from international oil price fluctuations and international situation.

2.2 China-kazakhstan cooperation

Kazakhstan is an important crude oil producer in Central Asia, with rich oil resources and recoverable reserves of 4 billion tons of crude oil. In 2021, the output of crude oil is 85.7 million tons, and the export of crude oil is 67.6 million tons, accounting for 79% of the total output of crude oil. Most of the domestic crude oil exported^[8]. Kazakhstan oil enters the international crude oil market through pipelines, and China-Kazakhstan crude oil pipeline is one of the important crude oil export channels of Kazakhstan^[9]. Kazakhstan exports its own crude oil to China through the China-Kazakhstan crude oil pipeline, which carries Russian crude oil to China at the same time, and Kazakhstan collects transit fees for Russian oil. At present, Russian oil accounts for more than 80% of the mixed oil transported by the pipeline. The average freezing point of the mixed oil is -14 °C, which realizes the normal temperature transportation in winter and reduces the energy consumption of pipeline transportation and the risk of winter operation.

The cooperation between China and Kazakhstan has broad prospects. The cooperation between the two countries in the field of crude oil has realized the complementary advantages of the two countries and conforms to the fundamental interests in the two countries. Kazakhstan's rich crude oil resources can fill the gap between China's demand for crude oil, and China's high degree of foreign trade openness promotes Kazakh oil exports to China^[10]. Meanwhile, exporting crude oil to China through pipelines is more reliable and less risky than shipping crude oil through tankers in the Strait of Malacca.

In the joint statement signed by the the President Xi Jinping and the Kazakh President Vladimir Zakayev in 2019, the two sides proposed to expand cooperation in the energy field and deepen cooperation in oil and gas fields according to the documents^[11]. The China-kazakhstan crude oil pipeline is an important channel for the export of Kazakh oil. So it is very important to strengthen the protection for the pipeline and ensure the safety of the pipeline. The long-term oil

transport agreement signed by China and Kazakhstan has provided guarantee for the safe and stable operation of the China-Kazakhstan crude oil pipeline.

2.3 Domestic demand

The world's oil demand will slow down in the future, and will decline after reaching the peak at 2030-2040. Oil consumption will still play an important role in the world's energy consumption of the future. Under the background of carbon peak and carbon neutrality, crude oil will remain an important energy source of China's social development and survival in the coming period^[12]. Data onto the National Bureau of Statistics show that China imported 513 million tons of crude oil in 2021, accounting for 72 percent of total crude oil consumption. On March 22, the National Development and Reform Commission and the National Energy Administration issued a notice on printing and distributing the 14th Five-Year Plan for Modern Energy System. The plan sets out the main goal of building a modern energy system during the 14th Five-Year Plan period. It expects that crude oil production will increase and stabilize at 200 million tons by 2025^[13]. Under the framework of China's macroeconomic forecast, based on the long-term trend of oil consumption of various industries, it expects that the average annual growth rate of refined oil demand of the "14th Five-Year Plan" is 0.91%, showing a slow growth trend. According to this growth rate, the total oil demand of 2025 will to be 732 million tons, of which 73% will still rely on imports^[14].

2.4 Economic environment

The China Academy of Petroleum Technology and Economics released the "World and China Energy Outlook 2050" for the fourth time, pointing out that the Asia-Pacific region will become the world's only net import of crude oil and will bear more than 95 percent of the world's net demand of crude oil imports by 2050. Although the current demand for oil have slowed down, it is still in a slow growth trend^[15]. The Alashankou-Dushanzi-Urumqi crude oil Pipeline serves as a passage through crude oil import from northwest China, through which imported crude oil reaches Dushanzi Refinery, Urumqi Refinery, Yumen Refinery and other western refineries. It is then distributed among the northwest, southwest and central regions through the western and central refined oil product pipelines and the distribution network along the lines. Statistics from the National Bureau of Statistics show that in 2021, the GDP growth rates of Northwest (Shaanxi, Gansu, Qinghai, Xinjiang and Ningxia), Southwest (Chongqing, Sichuan, Yunnan, Guizhou and Tibet) and central (Shanxi, Henan, Anhui, Hubei, Jiangxi and Hunan) were 14.29%, 10.69% and 11.22%. Per capital disposable income rose 8.64 percent, 11.63 percent and 9.45 percent, China's economic development has strong durability and resilience, and the vitality of the main market and the ability to resist risks is the basis of economic growth. The rapid development of social economy accompanies the

growth of the demand for crude oil, which also promotes the development of the pipeline industry.

2.5 Geographical environment

The Alashankou-Dushanzi-Urumqi crude oil pipeline locates in the central and western region of Xinjiang, which is cold in winter. In the middle of February 2022, the lowest ground temperature of the valve chamber along the pipeline is 3 °C. In 2021, the average freezing point of oil products transported by the crude oil pipeline is -14 °C, which meets the safe operation need that the freezing point of the pipeline is at least 5 °C below ground temperature during winter operation. The soil in this area is sandy soil, and the surface along the pipeline is Gobi beach, with sparse vegetation and serious soil and water loss in case of rain erosion. The dry climate of little rain reduces the moisture content of the surface sand soil, and the surface soil is alkaline. Compared with the acidic soil with enough water content, the external corrosion rate of the pipeline reduces^[16]. The rainfall concentrates on summer from June to August. Coupled with the high temperature in summer, the melt water of icebergs increases, and the water flow of rivers reaches the greatest in a year. Heavy rain and debris flow in summer are easy to lead to pipeline exposure and drift, so the safe operation and emergency disposal of pipelines puts forward higher requirements in summer flood season.

2.6 Security Environment

The third-party damage to the operation of crude oil pipelines cannot ignore. Terrorist organizations such as the "Three forces" destroy the normal order for society by various means, and violent terrorists cooperate with each other to carry out terrorist attacks on pipelines and other facilities, posing a serious threat to the development of the pipeline transportation industry^[17]. The "three forces" originated from the infiltration of international terrorist organizations. Strengthening international cooperation and fighting terrorism is an important way to safeguard regional security^[18]. China has strengthened cooperation with neighboring countries, including Kazakhstan, to fight terrorism. In 2019, China and Kazakhstan issued a joint statement stating that the "three forces" have posed a serious threat to the security and stability of the two countries. To deal with the threats and challenges, the two sides are willing to deepen security cooperation, safeguard the security of national border areas, and combat the "three forces" to maintain regional security and stability^[19]. Under the situation of cracking down on terrorism, the spread of terrorism curbed, and the anti-terrorism situation has been completely reversed. In recent years, Xinjiang has further strengthened its security situation. In a sound development environment, social security and stability as well as the safety of people's lives and property guaranteed, and various undertakings have made great progress. The Law on the Protection for Oil and Natural Gas Pipelines, which came into force on October 1, 2010,

clarifies the rights, obligations and responsibilities about pipeline protection, which can ensure the safety of pipelines and reduce external damage to pipelines^[18].

2.7 Russia-Ukraine situation

It is of great significance to predict the possible impact on the current international situation on the future, prevent the possible risks in time and make preparations in advance to ensure the import of crude oil^[20]. With the escalation of the situation between Russia and Ukraine, it has a huge impact on the transportation of international crude oil^[21]. The West, led by the United States, has imposed comprehensive sanctions on Russia, restricting the export of Russian oil, and the crude oil supply of Europe will face the risk of shortage. If the Russia-Ukraine talks make positive progress, the situation can cool about, and the impact on long-term international crude oil transport limits. But, if the situation between Russia and Ukraine continues to deteriorate and the Western sanctions on Russia's crude oil export are further intensified, the international crude oil supply will deteriorate further. The United States and Europe cannot find enough crude oil supply to make up for the gap in a short time, and the international oil price will rise. The sanctions imposed by the United States and Europe on Russia are a double-edged sword, which will have a negative impact on Russia's oil industry as well as its own economic development^[21]. If Russian oil export affects by U.S. and European sanctions, Russia will become more dependent on crude oil export routes to China. The situation between Russia and Ukraine is less likely to have a negative impact on the supply of crude oil from the Alashankou-Dushanzi-Urumqi crude oil pipeline.

2.8 Civil unrest in Kazakhstan

Social instability in Kazakhstan could affect Xinjiang's oil imports and security. China and Russia have reached consensus on opposing foreign interference in the internal affairs of countries in Central Asia, including Kazakhstan, and have cooperated in good faith to prevent chaos or war in the region, thus safeguarding regional peace and stability. After the riots broke out in Kazakhstan in January 2022, Russia dispatched troops to quell the riots, preventing further deterioration of the situation. Kazakh Ambassador to China Harbat Koishebayev said, "Kazakhstan will continue to develop under the established guidelines. The established policies of the state will not change, and all the obligations undertaken by the government will continue to put in place.^[22]" After the riot, the crude oil transportation of China-Kazakhstan crude oil pipeline carries out as planned, and the oil source upstream of the Alashankou-Dushanzi-Urumqi crude oil pipeline was not reduced or interrupted. The influence of China and Russia in Central Asia is prominent, and their ability to maintain regional peace and stability enhances. The possibility of another disturbance in Kazakhstan and

large impact on the oil supply in the upstream of the Alashankou-Dushanzi-Urumqi oil pipeline limites.

Both Russia and Kazakhstan have oil export needs and large domestic oil import needs, The "three forces" and other terrorism have curtailed, the Russia-Ukraine situation and the civil unrest in Kazakhstan have not had a large impact on the upstream oil source of the Alashankou-Dushanzi-Urumqi crude oil pipeline, which has broad development prospect.

3 Coping strategy

In the report on the 19th National Congress, it proposes to strengthen the construction of pipeline and other infrastructure networks, including long-haul crude oil pipelines^[23]. As one of China's four major crude oil to import channels, the Alashankou-Dushanzi-Urumqi crude oil pipeline is conducive to improving China's energy security and energy consumption structure, diversifying risks, and its strategic position is beyond doubt. Considering the internal and external development situation and aiming at the safe, efficient and smooth operation of the pipeline, the following management suggestions put forward.

3.1 Communication and coordination

The upstream pipeline of Alashankou-Dushanzi-Urumqi crude oil Pipeline belongs to the Oil, gas and New energy sector of Petrochina, the middle link of Dushanzi Petrochemical and Urumqi Petrochemical belongs to the Refining and Chemical sales and New materials sector of Petrochina, and the downstream pipeline belongs to the Western Pipeline Company of PipeChina. Strengthen the communication and coordination between the pipeline and the upstream and downstream, and establish a long-term and stable communication mechanism. Predict different types of anomalies or emergencies that may occur upstream and downstream in advance, and plan reasonable disposal measures.

The upstream of the pipeline connect to the China-Kazakhstan crude oil pipeline, which locates in Kazakhstan and carries a mixture of Kazakh and Russian oil. There are both cooperation and differences between Kazakhstan and Russia. The two countries have deepened their cooperation in politics, economy, military affairs and culture and are each other's important strategic cooperative partners. But in recent years, affected by the economic crisis and the Russia-Ukraine situation, the relationship between the two countries has undergone subtle fluctuations^[24]. The energy cooperation between the two countries has huge potential for mutual benefit and win-win results. Continuing to deepen cooperation is conducive to the social and economic development of both sides. Under the dual role of the depressed global economic situation and the political influence of the West, there are some uncertain factors whether the two countries can maintain a close friendly and cooperative relationship for a long time and maintain a stable and upward development trend, whether they can timely and deal with the unstable factors such as social

unrest and maintain the continuity of pipeline transportation. In view of possible abnormal situations such as upstream emergency shutdown, pipeline enterprises should organize upstream and downstream joint regular drills to strengthen the ability to deal with emergencies and reduce the impact on abnormal situations on pipelines, upstream and downstream. In the event of an emergency suspension of upstream transport, Dushanzi Petrochemical, Ulumuqi Petrochemical, Western Refined Oil Pipeline, Urumqi-shanshan Crude Oil Pipeline and the western areas radiated by these pipelines will affect to varying degrees. It is necessary to establish relevant emergency plans and organize relevant drills to deal with emergencies such as upstream emergency shutdown.

3.2 Reduce cost and increase efficiency

During crude oil pipeline transportation process, the benefit is an important symbol to measure the level of pipeline operation. How to reduce the operation cost, improve the operation efficiency and maximize the profit of pipeline enterprises is an important work.

Explore the influence of climate, industrial electricity price and other factors on pipeline benefits^[25]. Different seasons, different geographical conditions and different soil moisture content will make the temperature field of the pipeline change, and the fluidity of oil will also change, which will affect the transmission efficiency of the pipeline to different degrees. Some areas of the power sector to take power rationing measures, different time there are differences in the price of electricity. Explore measures such as cross-peak transmission, increasing pipeline transmission of low electricity price period, stopping or reducing pipeline transmission of high electricity price period, etc, to improve the use efficiency of electricity charged.

Improve the efficiency of pipeline transportation. Carry out the drag reduction agent experiment, according to different drag reduction agent and different dosage concentration and the correlation between the delivery, find the appropriate type of drag reduction agent and dosage concentration, improve the efficiency of pipeline transport. Pipeline pigging cycle and pig selection optimize to reduce energy loss during crude oil transportation. Alashankou-Dushanzi-Urumqi crude oil pipeline adopts normal temperature transportation, and the current oil condensate point can meet the safety requirements of normal temperature transportation in winter. If the upstream oil products change, it is necessary to heat the pipeline, heated by electric power, fuel oil, natural gas, etc. Different heating methods have different economic benefits. Find suitable heating methods to reduce fuel costs, and use intermittent heating during pipeline operation to control fuel costs^[26].

Control personnel cost expenditure, strengthen fund management. The staffing of intermediate stations and yards should reduce, the centralized control mode should strengthen, and some non-core businesses should outsource. To realize the sharing, centralized and unified control of maintenance, overhaul and emergency teams

between different stations and yards. The expenses detail, and the sensitivity analysis carries out on the expenditure of each expense and the pipeline transport volume one by one. The related expenses with poor sensitivity compress, and the capital investment increases to improve the efficiency of pipeline transportation and the safe operation of the pipeline^[27]. Linking the efficiency of fund use for the assessment of personnel, so on urge the management departments at all levels to pay attention to the efficiency of fund use.

3.3 Technical application

Emphasis should place on the application of internal corrosion detection and anti-corrosion technology for crude oil pipelines. Considering the soil environment, climatic conditions, hydrological characteristics and other factors, suitable internal corrosion detection tools and anti-corrosion technology for pipelines should adopt^[28]. The sensitivity and accuracy of pipeline leakage detection improved by using automatic pipeline leakage location technology. The automatic detection technology of crude oil physical properties applied to avoid the one-sidedness and discontinuity of manual sampling and detection, and realize the continuous detection of crude oil physical properties in the pipeline transportation. Besides, the UAV line patrol reduces the work intensity of manual line patrol, which is more safe and efficient; the application of 5G technology strengthens the data collection, data processing, intelligent remote control and emergency command of the pipeline; the application of domestic SCADA system is easy to maintain the data system and improve the security and stability of the system; artificial intelligence technology, big data analysis and other technologies have made the oil pipeline more stable and intelligent^[29-30].

3.4 Emergency management

Improve the emergency management ability of crude oil pipelines, establish long-term system and mechanism to deal with emergencies, so on reduce the impact of emergencies on the normal operation of crude oil pipelines^[31].

Establish emergency plans for public health security incidents. The outbreak of the novel coronavirus has affected the safe and stable operation of the pipeline, and there are potential risks such as on-site personnel cannot be timely in place, inspection and maintenance operations cannot complete on time, and pipeline oil products cannot test on time. Pipeline companies need to establish relevant systems and mechanisms, together with necessary emergency drills, which are effective measures to deal with public health emergencies such as the novel coronavirus epidemic^[32]. Pipeline companies need to ensure adequate supply of masks, disinfectant and other necessary anti-epidemic materials as well as production and living supplies in advance. Make scientific and reasonable arrangements for personnel to ensure that the pipeline can still operate when part of personnel cannot

be on duty; Optimize on-site inspection and maintenance operations to avoid the risk of the epidemic.

The leakage of crude oil pipeline is a major safety accident, which has an immeasurable impact on pipeline companies, upstream and downstream related enterprises and surrounding natural environment. Only by judging the leakage of pipeline and taking decisive measures can the accident be avoided and the impact on the accident limited to a controllable range. According to different pipeline leakage detection methods, the leakage events of crude oil pipelines are classified. Once the leakage is found, the pipeline should stop, and the upstream and downstream sections of the pipeline leakage point should be cut off to reduce the leakage amount. Field patrol personnel launched field patrol to confirm the site leak point, and the emergency rescue team immediately went to the leak point in emergency rescue.

Fire, explosion and debris flow along the pipeline pose serious threats to the normal operation and safety of the pipeline, which is a major safety hazard. Pipeline companies need to make thorough investigation and plan in advance, and dispose of one accident after finding one, so as to nip it in the bud, prevent possible accidents and prevent the occurrence of major safety accidents. At the same time, establish and improve the relevant emergency plans to ensure correct and effective disposal in the event of accidents, reduce losses.

3.5 Anti-terrorism and riot control

Crude oil pipeline, as an important infrastructure, is related to the development of various socialist undertakings, and is the target of violent terrorists^[17]. Pipeline enterprises need to strengthen cooperation with local governments to carry out risk assessment of violent and terrorist attacks, so as to regionalize and refine management of pipelines according to different risk levels, so as to make anti-terrorism and anti-riot work more targeted^[33]. Strengthen the monitoring and management of the area around the station yard. Adopt manual monitoring, fence construction, police dog patrol and other methods of timely detection and prevention of suspicious elements and suspicious vehicles near the pipeline facilities, so as to prevent them from happening^[34]. Strengthen data monitoring of pressure and flow along the pipeline, timely detect pipeline leakage caused by third-party damage, and deal with it. Improve employees' anti-terrorism awareness, avoid negligence and paralysis, and deal with pipelines in case of terrorist attacks or deliberate sabotage according to emergency procedures, so as to control losses to a minimum.

3.6 Corporate culture

Corporate culture will affect employees' recognition of the enterprise, their work attitude and the implementation of the relevant system of the enterprise, and then affect the business efficiency of the enterprise^[35]. Strengthen the construction of corporate culture, strengthen the sense of belonging, identity, participation of employees, so as to promote the continuous improvement of corporate

benefits. Adhere to the people-oriented, shape the core values of the enterprise, enhance the team consciousness, improve the team efficiency, maintain the image of employees and the enterprise. Improve the working environment, strengthen humanistic care, mobilize the enthusiasm of employees, the core values of the enterprise and employees' career pursuit organic combination, so that employees in the upward development of the enterprise to realize personal value. Establish a learning organization, form a learning atmosphere within the enterprise, and promote the in-depth study and discussion of corporate culture related knowledge. Establish a model in the staff, and create a positive, willing to contribute, hard work atmosphere.

3.7 Talent team

The company needs to establish a sound talent management method and build a high-quality team that is capable of doing business, having good quality, taking the bull by the horns and dedicating to the pipeline business. Create the soil for the growth of talents, adopt school-enterprise cooperation, mentor, horizontal communication and other ways to let new employees familiar with their own work as soon as possible, and encourage new employees to give full play to their own expertise, their own professional knowledge applied to the pipeline, to help the high-quality development of pipeline business^[36]. Optimize the talent structure, according to the pipeline enterprise's long-term planning to develop a reasonable talent training plan, the establishment of talent pool. Adopting a multi-channel promotion mechanism, combining technical and administrative routes, encouraging talents for technical expertise to engage in technical work and talents with comprehensive management ability to engage in administrative work. Salary management combines with pipeline benefits, and employees encourage to offer suggestions from all aspects to improve pipeline benefits, cultivate employees' benefit consciousness, and integrate energy saving, emission reduction, cost reduction and efficiency into their work.

4. Conclusion

The President Xi Jinping held talks with Russian President Vladimir Putin, and the two sides issued a joint statement to continue to strengthen energy cooperation between the two countries. Under this framework, China and Russia signed a 10-year contract to buy and sell 100 million tons of crude oil. The crude will pass through Kazakhstan, where it will mix with Kazakh oil at the Atasu station, then enter China via the Atasu-Alashankou crude oil pipeline, and then transport by the Alashankou-Dushanzi-Urumqi crude oil pipeline to refineries in Dushanzi, Urumqi and elsewhere. Refineries in the northwest will process the crude oil to meet the demand for petrochemical products of the western part of the country.

As an important channel for China's crude oil import, the Alashankou-Dushanzi-Urumqi crude oil pipeline,

with its upstream oil sources coming from both Russia and Kazakhstan and its downstream oil sources leading to western China, has a vital strategic position as it relates to the social and economic development of the region. Both Russia and Kazakhstan are big exporters of crude oil, and their social and economic development is dependent on the oil industry. Exporting crude oil to China is in line with the fundamental development interests in both countries. About three quarters of China's crude oil needs to be imported, relying on the Alashankou-Dushanzi-Urumqi crude oil pipeline to transport Russian and Kazakh oil to the western region, is the need and foundation of the economic development of this region. The pipeline locates in the central and western part of Xinjiang, the climate is dry and the winter is cold. The special climatic and geographical conditions put forward higher requirements for the safe operation of the pipeline. The security environment in Xinjiang improved on recent years. The situation between Russia and Ukraine and the civil unrest in Kazakhstan have not affected the normal operation of the pipeline. It is unlikely that similar regional events will have a significant impact on the pipeline in the future, and the pipeline has broad prospects for development.

To strengthen the construction of the pipeline, the following management measures put forward. Strengthen communication and coordination between upstream and downstream enterprises, establish upstream emergency outage emergency plan, reduce the impact of upstream emergency conditions on downstream enterprises; To reduce the cost and increase the efficiency, we should reduce the energy consumption of pipeline, improve the efficiency of pipeline oil transmission, control the cost and strengthen the fund management; Attach importance to the application of new technology and promote the intelligent development of pipeline; In response to public health events such as the novel coronavirus outbreak, oil pipeline leakage, fire, explosion, debris flow and other emergency conditions along the pipeline, practical emergency plans should establish and emergency drills should held; Pay attention to anti-terrorism and anti-riot work, maintain pipeline safety; Promote the construction of enterprise culture and talent team, and create a harmonious environment for training high-quality talent team. Through the work in the above aspects, we can cope with the changes in the international and domestic situation, and consolidate the goal of safe, efficient and stable operation of the pipeline.

Reference

1. Joint statement of the people's Republic of China and the Russian Federation on international relations and global sustainable development in the new era[N].The People's Daily,2022-02-05(002). DOI:10.28655/n.cnki.nrmrb.2022.001180.
2. ZHANG Hong.China and Russia issued a strong voice to safeguard international fairness and justice[N].People's Daily Overseas Edition, 2022-02-10(009).DOI:10.28656/n.cnki.nrmrh.2022.000417.
3. WANG Baoqun.China's four continental routes for importing crude oil[J].Petroleum Knowledge, 2016(01):26-27.
4. XIAO Yang.Risks and Countermeasures of China's oil and gas pipelines in Central Asia[J]. Contemporary World,2011(09):52-54.
5. QI Aihua, CAO Bin, XU Shunhua, HU Yong.Current situation and future trend of Russian crude oil production and export[J].International Petroleum Economics,2015,23(02):69-74+111.
6. CHEN Shujia, WANG Zhaojun.Study on the influence mechanism of geographical factors on the pattern of world oil trade - a case study of Russia[J].Dongjiang Journal,2012,29(01):64-68.
7. Joint statement of the people's Republic of China and the Russian Federation on the 20th anniversary of the signing of the Sino Russian Treaty of good neighborliness,friendship and cooperation[N].The People's Daily,2021-06-29(002).DOI:10.28655/n.cnki.nrmrb.2021.006821.
8. ZHAO Nuoya.How important is Kazakhstan to China?[N].Guancha Syndicate,2022-01-09.
9. CAO Bin, HU Yong, YUE Xiaowen, LI Jincheng, XU Shunhua.Current situation and future trend of crude oil production and export in Kazakhstan[J].Petroleum Planning & Engineering, 2015,26(04):5-7+52.
10. CHALGYNBAYEVA A.Study on the influencing factors of energy cooperation between Kazakhstan and China[D].Minzu University of China,2018.
11. Joint statement of the people's Republic of China and the Republic of Kazakhstan[N].The People's Daily,2019-09-13(002).DOI:10.28655/n.cnki.nrmrb.2019.009904.
12. ZHU Fahua, WANG Yushan, XU Zhen,XU Changri, DING Li.Research on China's Energy Low Carbon Developmeng under the Targets of Emission Peak and Carbon Neutrality[J].Environmental Impact Assessment,2021,43(05):1-8.DOI:10.14068/j.ceia.2021.05.001.
13. MA Xiaomin.The 14th Five-year Plan for the Modern Energy System published[N].China Mining News,2022-03-24(001).DOI:10.28106/n.cnki.nckyb.2022.000499.
14. XING Zhihe, LUO Yantuo.Refined oil consumptions in China and its demand forecast during the 14th Five-Year Plan period[J].International Petroleum Economics, 2020,28(08):58-65.
15. SHI Shi.The Asia Pacific region will become the world's only net importer of crude oil[J].World petroleum industry,2019,26(05):62.
16. PAN Yongze.Cause Analysis and Protection Technology of Corrosion and Perforation of Buried Metal Pipeline[J]. Adhesion,2019,40(12):115-118.
17. ZHANG Minghong, YU Wenming.Cause analysis of "third party damage" of oil and gas pipeline from the

- perspective of public safety[J].Research Report on social public security in China,2016(02):59-68.
18. YAO Nan.On international cooperation in combating the "three forces" in Xinjiang and its surrounding countries [D].Ji'nan University,2010.
 19. Joint statement of the people's Republic of China and the Republic of Kazakhstan[N].The People's Daily,2019-09-13(002).DOI:10.28655/n.cnki.nrmrb.2019.009904.
 20. TAO Wei.Transportation Capacity of China's Crude Oil Imports[D].China Foreign Affairs University,2012.
 21. GUO Jinhui.The freight of some international routes soared, and the conflict between Russia and Ukraine disturbed the international oil transportation market[N].China Economic Times,2022-03-03(002).
 22. BAI Bo, YANG Zhiye.Where did Kazakhstan go after the riots?[N].Beijing Daily,2022-01-12(012).DOI:10.28033/n.cnki.nbjrb.2022.000317.
 23. Authoritative release:full report of the 19th CPC National Congress [N].CCTV Finance,2017-10-18.
 24. SHUN Mengdi.Studies on relations between Russia and Kazakhstan since the 21st Century[D].Heilongjiang University,2019.DOI:10.27123/d.cnki.ghlju.2019.001362.
 25. SONG Wei.Design of efficiency evaluation index system of oil pipeline company[J].Knowledge Economy,2016(01):128.DOI:10.15880/j.cnki.zsjj.2016.01.091.
 26. LIANG Guangchuan, CHENG Yuanjing, MA Peihong, LIAO Chongchun, LI Peng.Study on efficiency analysis method and energy saving of gathering and transportation pipeline[J].Natural Gas and Oil,2011,29(05):6-8+30+98.
 27. WANG Jiong, HUI Caixia.Analyze the measures of reducing cost and economic operation in the pipeline transportation company[J].Chinese & Foreign Entrepreneurs,2012(13):157.
 28. LIU Baoyu, Zou Tan, YAN Shuo, WEN Qingchang.Research on Internal Corrosion Detection Technology of Crude Oil Pipeline[J].Pipeline Technique and Equipment,2021(02):33-36+46.
 29. CHEN Shuai.Discussion on the application of 5G communication technology in intelligent control of long distance natural gas pipeline[J].China Plant Engineering,2022(07):27-29.
 30. LI Wei, XIE Yunfei.Research on emergency command and communication system of new refined oil pipeline based on 5G[J].Digital Communication World,2021(09):126-127.
 31. ZHANG Xixiang, JIA Shaohui, YANG Yufeng, ZHANG Qiang, LIU Shuo, HAN Xiaoming.Brief analysis of emergency management system of National base for emergency rescue of long-distance oil and gas pipeline[J].China Petroleum and Chemical Standard and Quality,2021,41(06):1-3.
 32. LIU Lyuhong, FU Junli.China's experience in fighting COVID-19 and the way forward[J].Journal of Zhaotong University,2022,44(02):1-8.
 33. HUANG Jie, ZHANG Xianfeng.Risk assessment of regional violent terrorist attacks in southern Xinjiang[J].China Safety Science Journal,2022,32(02):192-199.DOI:10.16265/j.cnki.isn1003-3033.2022.02.026.
 34. TANG Fangsuo, SHUN Zhiguo, FENG Yufan.Discussion on the application of police dogs in knife-axe slash-like violent terrorist attacks[J].Guangdong Gongan Keji,2021,29(04):59-61.
 35. XIE Mingyu.Research on the influence of corporate culture on employee performance[D].Central South University of Forestry and Technology,2018.
 36. LIU Kun, XIN Yanping, LI Tianyu.Research and practice on talent training mode of oil and gas storage and transportation under the background of smart pipeline construction[J].Journal of Higher Education,2022,8(21):168-171.DOI:10.19980/j.CN23-1593/G4.2022.21.040.