

Analysis on Quality Control Group Activity of CNPC in 2022 and Discussion on Improvement Measure

Zhaochuan Li^a, Lin Gan^b and Changyue Liu^c

CNPC Research Institute of Safety & Environmental Technology, Beijing 102206, China
^aleoupc@163.com, ^bgan-lin@cnpc.com.cn, ^cliuchangyue@petrochina.com.cn

Abstract: Quality Control Group activity has been carried out in CNPC for more than 40 years. Through continuous participation and summary, the Quality Control Group has become an effective organizational form of quality management of a mass character in CNPC and an effective way for CNPC to improve quality management. Based on the harvest and experience of CNPC in carrying out Quality Control Group activity in 2022, this paper focuses on the role of carrying out Quality Control Group in consolidating the foundation and promoting innovation in quality management, as well as effective measures on how to promote Quality Control Group activity.

Keywords: Quality Control Group, Quality Management, Improvement measure.

1. Introduction

In 1981, the Ministry of Petroleum Industry issued the Decision on Implementing Total Quality Management and Carrying Out Mass Quality Control Activities, which set off the climax of implementing total quality management in the petroleum industry. The development of total quality management has played an essential role in enhancing the quality awareness of cadres and workers in petroleum enterprises, improving the quality of enterprises, and ensuring and promoting the quality of production, transportation, services, projects, and products. As the essential critical work of total quality management and the main form of mass quality control activities, Quality Control Group (QC Group) activities have played a decisive role in developing quality management in the petroleum industry. In the great-leap-forward development of the petroleum industry, the thorough implementation of such a modern system management institution as total quality management and the effective promotion of the healthy development of the activities of the

petroleum industry QC Group will help to promote the transformation of the management concept of the cadres and workers in petroleum enterprises, and improve the management level and overall quality of petroleum enterprises [1, 2, 4].

QC Group is a group of workers engaged in various kinds of labor in production or work posts, organized around the enterprise's business strategy, policies and objectives, and the problems existing on the site to improve quality, reduce consumption, improve people's quality and economic efficiency, and carrying out activities using the theory and methods of quality management. QC Group comprises a group leader and members, with 3~10 persons [3]. The participants can be all the enterprise members, including the person in charge of the enterprise, the technical management, the production vehicle director, the quality supervisor, and the quality inspector (Table 1 is the composition of the QC Group of an oilfield enterprise). The QC Group leader is the critical group member, mainly responsible for formulating the activity's theme, content, and progress [5, 6].

Table 1. Composition of QC Group of an oilfield enterprise

Role	Name	Duty	Profession	Group Division
Group Leader	A	Chief Engineer	Senior Engineer	Plot
Group Member	B	Workshop Manager	Engineer	Guide Production
Group Member	C	Mechanical Manager	Engineer	Guide Technology
Group Member	D	Mechanical Designer	Engineer	Device Support
Group Member	E	Technician	Engineer	Technical Support
Group Member	F	Technician	Assistant Engineer	Data Collection
Group Member	G	Technician	Assistant Engineer	Data Analysis

Based on the harvest and experience of CNPC in carrying out QC Group in 2022, this paper focuses on the role of carrying out QC Group in consolidating the foundation and promoting innovation in quality management, as well as effective measures on how to promote QC Group further.

2. Analysis on Quality Control Group of CNPC in 2022

CNPC has 8 companies, including the Company of Exploration and Production (CEP), the Company of Natural

Gas Sales (CNGS), the Company of International Exploration (CIE), the Company of Technology Service (CTS), the Company of Refining-chemical and Production (CRP), the Company of Refined-oil Sales (CRS), the Company of Engineering Construction (CEC) and the Company of Equipment Manufacturing (CEM). The amount of QC Group achievements reported by each company this year is shown in Fig. 1. As shown in Fig. 1, the Company of Exploration and Production had 55 QC Group achievements, the Company of Natural Gas Sales had 10 QC Group achievements, the Company of International Exploration had 10 QC Group

achievements, the Company of Technology Service had 25 QC Group achievements, the Company of Refining-chemical and Production had 27 QC Group achievements, the Company of Refined-oil Sales had 20 QC Group achievements, the Company of Engineering Construction had 10 QC Group achievements, and the Company of Equipment Manufacturing had 10 QC Group achievements. It is indicated that exploration and production, technical service, refining-chemical and production, and refined-oil sales were business segments with more QC Group achievements, which was also the main business of CNPC.

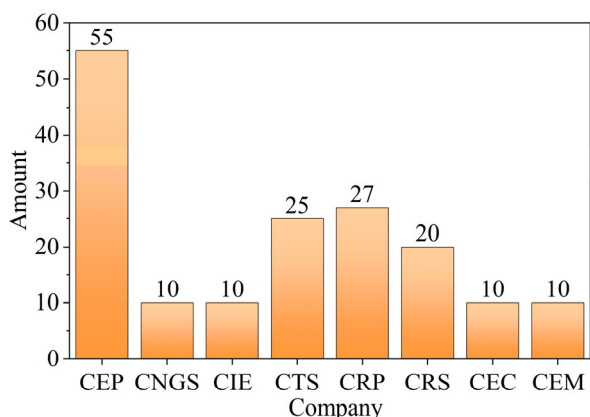


Figure 1. QC Group achievement amount of CNPC

After the QC Group's establishment, the subject needs to be selected for activities. The source of the subject can be divided into three aspects: mandatory subject, instructional subject, and self-selective subject. The mandatory subject is a subject that the superior competent department sends to QC Group in the form of administrative instruction according to the actual needs of the enterprise. This subject is usually a significant technical problem that needs to be solved urgently in the production and operation activities of the enterprise. The instructional subject is recommended and published by the quality management department of an enterprise according to the needs of realizing business strategies, guidelines, and objectives. Each group chooses appropriate subjects to carry out activities according to its conditions. The self-selective subject is those that the QC Group seeks and chooses on its own, usually from daily production, service, and work site. The source of QC Group achievement subject of CNPC this year is shown in Fig. 2. As can be seen from the figure, the proportion of mandatory, instructional, and self-selective subjects are 10.18%, 16.17%, and 73.65%, respectively.

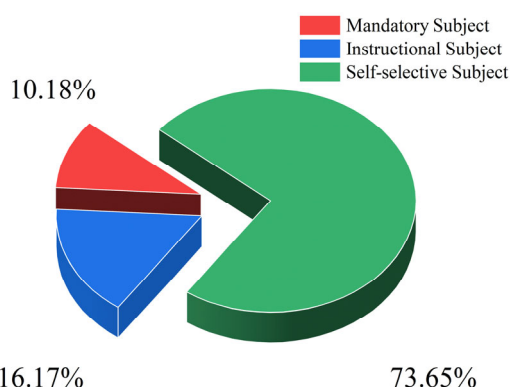


Figure 2. QC Group achievement subject source of CNPC

According to the subject characteristics of QC Group, it can be divided into five types: field-type, service-type, research-type, administrative-type, and innovation-type. Among them, the field-type subject is usually selected as a topic to stabilize the quality of the production process, improve product quality, reduce consumption, and improve the production environment [7]. This subject is small, manageable, short-cycle, and easy to achieve results, but the economic benefits are not necessarily great. The service-type subject is usually selected to promote standardization, procedure, and scintillation of service and improve service quality and benefit. It is small, has a short activity time, and has a quick result. Although economic benefits are not necessarily great, social effects are apparent. The research-type subject usually takes solving critical technical problems as the scope of topic selection. The subject is complex, the activity cycle is long, more resources must be invested, and the economic benefit is usually remarkable. The administrative-type subject is usually selected to improve the quality of business work, solve problems existing in management, and improve management level. They can be large or small, so the difficulty of the subject is different. The innovative-type subject is a subject for QC Group members to develop new products, projects, and methods and achieve the expected objectives by using new thinking and innovative methods. The QC Group achievement types of CNPC this year are shown in Fig. 3. From the figure, we can see up to 112 field-type subjects, 21 research-type subjects, 17 innovative-type subjects, 13 service-type subjects, and 4 administrative-type subjects.

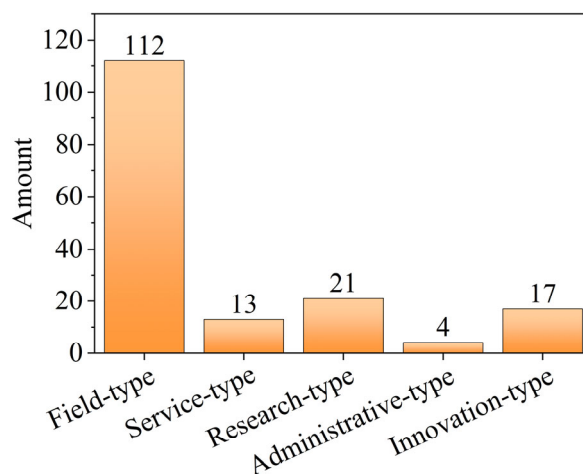


Figure 3. QC Group achievement type of CNPC

Achievements made in carrying out QC Group activities can be divided into two categories: tangible and intangible. Tangible achievement refers to the achievements displayed in material or value form and can directly calculate economic benefits. This achievement easily attracts employees' attention and will become the focus of organizing results reports, publishing exchanges, and rewards. Intangible achievement refers to those achievements that are difficult to express in material or value form and can not directly calculate their economic benefits. They play an essential role in developing the intelligence of QC Group members, mobilizing employees' enthusiasm, improving their quality, fostering talents, and enhancing collective cohesion. They are often manifested in the mental outlook of employees, such as professionalism, work awareness, initiative, work skills, Etc.

The positive change in employees' spirit and psychology will undoubtedly have a more profound, more comprehensive, and longer-term impact on the economic benefits of enterprises. The QC Group achievement classification of CNPC this year is shown in Fig. 4. As can be seen from the figure, the proportion of tangible achievements is 93.71%, which is much larger than that of intangible achievements by 6.29%.

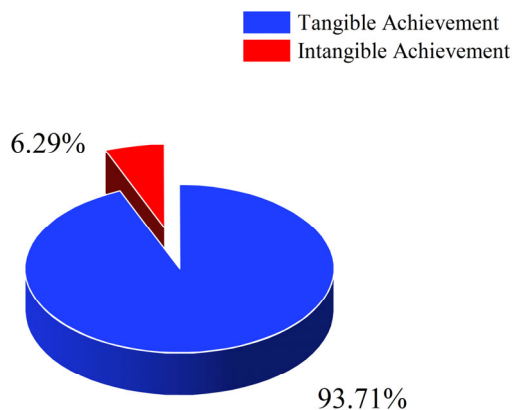


Figure 4. QC Group achievement classification of CNPC

The QC Group achievement awards of CNPC are shown in Fig. 5. As seen from the figure, the Company of Exploration and Production has won 10 first-class prizes, 14 second-class prizes, 29 third-class prizes, and 2 eliminated. The Company of Technology Service won 4 first-class prizes, 9 second-class prizes, and 12 third-class prizes. The Company of Refining-chemical and Production won 5 first-class prizes, 4 second-class prizes, 13 third-class prizes, and 5 eliminated. The Company of Engineering Construction won 3 second-class prizes and 7 third-class prizes. The Company of Equipment Manufacturing won 7 third-class prizes and eliminated 2. The Company of Refined-oil Sales won 10 third-class prizes and eliminated 10. The Company of International Exploration won 2 third-class prizes and eliminated 8. The Company of Natural Gas Sales eliminated 10 items.

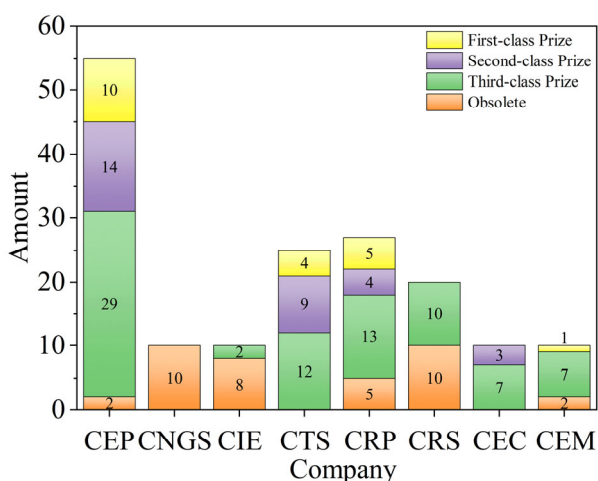


Figure 5. QC Group achievement award of CNPC

3. Effective Measures to Promote QC Group Activities Further

CNPC has mobilized employees' enthusiasm by carrying out QC Group activities, solved a series of problems in production and operation, improved the quality of products, projects, and services, and formed various innovative

achievements in quality management. However, during the actual development of QC Group activities, there were still some problems, such as a lack of interest, initiative, and self-awareness of the group members. In order to strengthen guidance, increase motivation and create a more vibrant activity atmosphere, as an organizer of QC Group activities in the next year, the following measures can be used to improve the effectiveness of QC Group activities.

3.1. Create an Activity Atmosphere

Enterprises should closely focus on quality awareness education, actively create an atmosphere for QC Groups' activities, and cultivate employees' interest in consciously participating in quality improvement.

Leadership's emphasis is fundamental to creating an atmosphere. Leaders at all levels attach importance to quality in their specific work [2]. For the activities of QC Group, we should stand at the height of mobilizing the enthusiasm and creativity of employees, driving the effective operation of QC Group, and promoting the improvement and innovation of enterprise quality. Prominent leaders should pay attention to and support it. The leaders in charge should pay attention to it personally and frequently and become active promoters of the activities of the QC Group. Leaders at all levels should promote the activities of the QC Group by arranging and summarizing the relevant quality meetings. Leaders attach great importance to QC group activities and convey positive information to employees who actively seek topics in their work and consciously organize group activities.

Establishing institutions is the key to creating an atmosphere. Institutions are the guarantee for carrying out various work. What enterprises encourage and punish can be reflected by the institution. Establish the management method of enterprise QC Group, make clear the purpose, management responsibility, work procedure, review method, and guidance of rewards and punishments, which can tell employees how to do and what to do. Employees can experience the quality atmosphere of the enterprise through the institution. The activities of QC Group can be guaranteed by the enterprise institution, which will attract employees' attention at all levels and develop continuously.

Educational training is the driving force for creating an atmosphere. To carry out QC Group activities, enterprises must educate and train employees to understand, familiarize themselves, accept, and apply QC Group activities [6]. There are three levels to carry out education and training on QC Group activities: one is external training, which can be attended by leaders in charge, personnel in charge of departments and backbones of main activities; second, internal enterprise-level training, organizing key member activities for systematic knowledge training; third, internal basic level training, basic knowledge training for group members by critical members. There are three aspects for enterprises to carry out QC Group activities education and training: first, QC Group activities knowledge training, focusing on basic concepts, management process, and activity procedures; second, QC Group activities tools training, so that the key members are familiar with statistical methods, understand the use of tools and master the use of commonly used tools; third, QC Group activities results collation, publishing skills training, by explaining the inherent logical relationship of activities results, publishing the key points to be mastered, to enhance the group member's ability to express words and languages.

Achievement review is an enabler in creating an atmosphere. Employees need to be recognized for their work. After the QC Group activities have achieved achievements, it is necessary to organize on-site reviews in time to praise the achievements, correct the shortcomings and point out the direction of efforts. Regular organization and publication of reviews can exchange experience, exercise ability, identify talent, and create a playful atmosphere. At the same time, the achievement review is a vibrant way to integrate employees and leaders. It is a periodic summary of QC Group activities and the continuing mobilization. It is a crucial link for enterprises to create an atmosphere for QC Group activities.

3.2. Promoting Activities

Enterprises should combine the actual conditions of personnel and work to promote the development of QC Group activities vigorously and continuously improve quality control performance.

Departmental communication is a long-term mechanism to promote activity development. An enterprise's competent business departments shall take the QC Group's activities as a daily business and manage the activities according to the procedures planned, arranged, and summarized. First, we should start with group registration and subject selection and go deep into the basic units to help find problems and determine subjects. Help the group to plan the process, content, and time allocation of the activities. It can help the group members have a clear idea of the activities. Guiding the group to summarize the achievements is the key to improving the confidence of group members [3, 4]. At the same time, the competent department shall inquire, urge, inspect and guide the activities of QC Group during daily work inspection.

The key member function is the guiding mechanism to promote development. Key members need to participate in QC Group activities actively, to fully master the procedures, methods, and tools of activities, to be familiar with the achievements preparation and publication, to be able to impart knowledge actively, to excavate more excellent results, and to organize the achievements can give more fabulous inspiration. The development of QC Group activities needs to play a leading role in key members.

Recognition and reward are incentives to promote development. Achievements achieved through hard work can be recognized and rewarded so that employees can fully recognize their value, find a sense of accomplishment, stimulate greater motivation, tap into the more significant potential, and contribute to the enterprise. In addition to honorary and material awards for achievements, attention should also be paid to verbal praise of relevant work performance, vigorous publicity and promotion of achievements, and the reuse of outstanding key member activities.

Assessment evaluation is the restraint mechanism to promote development. A cheerful group needs to mobilize the enthusiasm of its employees fully [1, 4]. QC Group activities aiming at improving the quality of work and service will inevitably receive strong support from excellent groups. Therefore, in the situation of CNPC striving for excellence and pioneering, local enterprises will significantly promote

the development of QC Group activities if they take the QC Group activities as a condition to be included in the assessment indexes when evaluating units comprehensively. As a restraint mechanism, assessment and evaluation of excellence will not restrict the progressive group but will only bring more power to it.

4. Summary

QC Group is an effective organizational form for mass quality control activities in CNPC. It is the result of combining the experience of employees participating in enterprise democratic management with modern scientific management methods. QC Group is an essential manifestation of the eight basic quality management principles in ISO9000. It has broad popularity and is conducive to the realization of full participation in quality management. Through QC Group activities, group members can discuss their work, work together and improve the relationship between people, which is conducive to enhancing the unity and cooperation of employees. QC Group activities are an effective way to attract broad masses to actively participate in quality control and an important measure to promote product and project quality and economic benefits.

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