



Management and Control System of “Four First-Class” Team Construction Based on Artificial Intelligence Technology

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Abstract. Based on artificial intelligence technology, the production, marketing and management of four first-class teams are designed to form an intelligent management system. Automatically release the work content and completion time, standardize the work execution project, and realize the closed-loop management of team construction. Visually display the completion of the team work, follow up the work progress and improve the team work efficiency. Through the evaluation algorithm, the team work is scored, the weak links are located, and the working methods and management methods are improved.

Keywords: Four first-class · team construction · management and control system · artificial intelligence

1 Introduction

In order to meet the requirements of actively building a global energy Internet and accelerating the construction of China’s energy Internet [1], plan the future development direction and organization management form in advance, strengthen the construction of new, modern and future oriented teams, grasp the core elements of enterprise management in the new era, strengthen crisis awareness, Internet awareness and practical awareness, from environmental impact, team positioning Actively explore the development direction and change trend of team construction, constantly modify and improve, and improve the team management level of the company in terms of construction system and team organization structure, internal management, technological change, innovation and entrepreneurship, employee growth, cultural construction mode, etc [2].

In order to fully implement and promote the construction of “four first-class” teams, carry out team construction with high quality [3]. In accordance with the guiding content of “four first-class” team construction, the power supply branch carries out innovative work from the two aspects of promoting implementation and construction results, establishes the construction of “four first-class” team construction control system, timely grasps the construction of “four first-class” teams of the company, and timely finds and improves the shortcomings and problems of construction, Comprehensively promote the construction, implementation and management of “four first-class” teams.

2 Design Team Construction System

Taking the team construction work as the core, classify and divide various work, formulate team work matters, form team work standards [4], and Design scores corresponding to work standards to form work evaluation standards and evaluation system. The team construction work system is shown in Table 1.

Table 1. Team construction work system.

Work items	Working standard	Standard score
Basic work of safety production	The data box is complete, the data content in the box is complete, and the record book is updated in time.	25
Skill training	The effective sharing of knowledge and experience is realized through the micro lecture hall, so as to ensure that employees can carry out relevant learning and training at any time, and ensure that employees can apply what they have learned.	15
Distribution network wiring diagram	The accuracy of the number of secondary transformers, the number of stations, the number of distribution network lines, switch number, line name, conductor model, important user information and the installed capacity of the self owned power plant is 100%.	15
Basic management of production team	<ol style="list-style-type: none"> 1. Have the rules and regulations issued by the superior unit and the rules, regulations and specifications implemented by the discipline. 2. The basic management data of the team shall be standardized, and the recorded information shall be accurate and complete; 3. Skilled application of production management information system and smooth process execution. 4. Standardized operation process shall be implemented for on-site operation, safety management measures shall be in place, and on-site management shall be strictly implemented. 5. All hardware facilities meet the production requirements. 	100

(continued)

Table 1. (continued)

Work items	Working standard	Standard score
Operation and maintenance of distribution equipment	<ol style="list-style-type: none"> 1. Each county company and power supply station shall have the equipment operation and maintenance responsibility system manual, and carry out the operation and maintenance work on a piecemeal basis. 2. The data records of power distribution discipline shall be filled in standard and complete. 	50
Measurement management	<ol style="list-style-type: none"> 1. The coverage rate of intelligent electric energy meter is 100%, and the annual average success rate of full volume data acquisition is 99%. 2. The fault phenomenon of electric energy metering device shall be recorded correctly and photographed for evidence. 3. If the measurement seal is managed by a specially assigned person, there are no missing items in the receiving record. 	20
Line loss management	<ol style="list-style-type: none"> 1. 0.4kV line loss rate of power supply substation $\leq 5\%$. 2. The qualified rate of line loss in the station area is $\geq 95\%$, and the online monitoring rate of line loss in the same period in the station area is 99%. 3. Line loss analysis, plan, assessment method and work trace records are complete. 	30
Business expansion report and installation management	<ol style="list-style-type: none"> 1. The archive information shall be consistent with the system information and user site information. 2. There are no ultra short or extended work orders. 3. The business handling personnel are familiar with the business handling process. 	10
Power consumption inspection management	<ol style="list-style-type: none"> 1. The rectification of problems found during marketing inspection shall be reflected in quantity. The specific work completion of each inspection cycle shall have phased work summary. 2. The user side safety inspection shall be carried out monthly, and the plan shall be implemented and the data shall be archived. 	30

(continued)

Table 1. (continued)

Work items	Working standard	Standard score
Business hall management	The dress of the personnel shall meet the requirements, all kinds of signs and famous brands shall be complete, and the new business process shall be mastered skillfully.	25

Table 2. Implementation of team work.

department	Release quantity	Received quantity	Confirmed quantity	Implementation rate
Team A	104	104	102	98.08%
Team B	86	86	83	96.51%
Team C	122	122	120	98.36
Team D	98	98	95	96.94%

3 Application of Artificial Intelligence Technology

Based on the team construction evaluation system, artificial intelligence technology, big data technology and information technology are adopted to take a unified management mode for the construction, production [5], marketing, Party construction and management of the four first-class teams, assign the work directly to the responsible person, standardize the work implementation, realize the closed-loop management of p-release-d implementation-c inspection-a improvement, and show the completion of the team work, Reduce the team workload, follow up the work progress, and evaluate the team work score scientifically and objectively. Locate weak links, improve working methods and management methods, and improve team work efficiency.

3.1 Refine the Work Unit and Implement Each Work to the Person

Establish a “visual” work execution management mode [6], decompose and quantify the “four first-class” team construction work, daily work and assessment indicators, and refine the work unit, Form “nine elements” work records (work, time, place, personnel, measures, status, specialty, department and classification) to realize the systematic records of the whole process of work. Establish a matching mechanism for the person in charge of work, and automatically assign the work records to the person according to the elements such as equipment ownership system, station area manager, post division and job responsibility, so as to realize the “one-to-one correspondence” between work and the person in charge The implementation of the work is shown in Table 2.

Table 3. Reporting of team work.

department	Number of jobs	Number of information records	Number of uploaded pictures	Upload rate	Average number of pictures
Team A	104	104	365	100%	3.5
Team B	86	86	402	100%	4.7
Team C	122	122	268	100%	2.2
Team D	98	98	301	100%	3.1

3.2 Unified Work Release

Establish a unified task assignment method of the company. The background system imports work content, appraisal indicators, etc. in batch. According to the work type and requirements, it shall be uniformly released in “day, week and month”. Realize the “work real-time communication” application and “real-time” reception of work release.

3.3 Work Execution Report

Automatically receive work information and view work content, work requirements and completion deadline. Select the work completion status and work description according to the actual work. Upload site work pictures and report work execution information. After submission, the system will automatically record work information and data. The report of work execution is shown in Table 3.

3.4 Centralized Management of Work Progress

Unified management of work record data and classified summary of uploaded work information. Show the progress of team construction of the company. Supervise and review the work quality, and check the work implementation of each team in real time. Count the number and details of work completed by the team to realize the centralized management of work execution. Work summary is shown in Table 4.

3.5 Visual Display of Working Conditions

Visual display of team work according to work requirements, assessment indicators and management specifications. Form weekly, monthly, quarterly and annual team work summary. Regularly publish the work completion list and establish a dynamic control mechanism for team work. Establish Kanban release and graphic visualization to show the work release and completion of the team. The team work ranking is shown in Table 5.

Table 4. Summary of team work.

department	Number of jobs	Confirmed quantity	Implementation rate	Number of information records	Number of uploaded pictures	Upload rate
Team A	104	102	98.08%	104	365	100%
Team B	86	83	96.51%	86	402	100%
Team C	122	120	98.36	122	268	100%
Team D	98	95	96.94%	98	301	100%

Table 5. Work ranking of teams.

department	Total ranking	Ranking of work quantity	Ranking of implementation rate	Upload picture ranking	Average number of pictures
Team A	2	2	2	2	2
Team B	4	4	4	1	1
Team C	1	1	1	4	4
Team D	3	3	3	3	3

4 Results Have Been Achieved

The “four first-class” team construction management and control system shall be applied to establish a working mechanism of “unified release, real-time upload, centralized statistics and dynamic management and control”. Assign work tasks, responsibilities and assessment indicators directly to each employee, stimulate the work vitality of team employees, summarize and display the work implementation of employees, and promote benign competition among employees. Promote the efficiency improvement and benefit creation of power supply branch.

Take the construction of four first-class teams as the core, integrate various work contents, work plans and assessment indicators of the company, and uniformly assign work contents and completion time. Notify and remind the responsible person to check the work content, requirements and deadline. The person in charge of the work uploads the work execution through the system, fills in the work information, reports the work-related pictures, and shows the actual work status. The management personnel shall keep abreast of the work progress of each team at any time, check the implementation effect of each assigned work, and summarize the completion of each team’s work and indicators in a systematic manner.

5 Conclusion

Based on the management and control of “four first-class” team construction, the next step will be to carry out in-depth application and detailed management, integrate the quantitative system, management and control system, evaluation system and value system, and establish a working mechanism of “work quantification, on-site management and control, visual record and value evaluation”. Taking the quantitative scoring of employees’ work as the core, establish the evaluation model of the whole process of work, and establish the employee workload evaluation index system of power supply branch in combination with the scoring standards and coefficients of marketing, production, human resources and other professional departments. Make each work correspond to scores and indicators. The system automatically calculates the score of employee workload to ensure that the workload score is true and accurate, and comprehensively display the employee’s work status and score ranking. It provides a more authentic and effective basis for salary distribution, performance appraisal, year-end evaluation, etc.

References

1. Huang A Q, Crow M L, Heydt G T, et al. The Future Renewable Electric Energy Delivery and Management (FREEDM) System: The Energy Internet[J]. Proceedings of the IEEE, 2010, 99(1):133–148.
2. Shi-Tong X U, Zeng F L. Strengthening Experimental Team Construction and Promoting the Creative Talents Cultivation [J]. Research and Exploration in Laboratory, 2009.
3. Sun L N, Li-Jun H E. Study of the College Instruction Team Construction Based on Team Theory[J]. Hebei Academic Journal, 2007.
4. Jia X, Wang Y. Discussion on standard management of team work for construction enterprises [J]. Shanxi Architecture, 2017.
5. Simari G, Rahwan I. Argumentation in Artificial Intelligence[J]. Springer US, 2009.
6. Ligeza A. Artificial Intelligence: A Modern Approach[J]. Applied Mechanics & Materials, 2009, 263(2):2829–2833.

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