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Content and structure of China coal mine operators’ psychological contract

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Abstract

Psychological contract is the key condition to form and select behavioral motivation for employees in the organization. In this article, we empirically study the content and structure of mine operators’ psychological contract in typical Chinese coal enterprises. Based on studying the coal mine operators’ psychological contract concept model, we validate the content and structure of core operators’ psychological contract, i.e. organization obligation is composed of four dimensions including production guarantee, growth guarantee, organizational respect and organizational development, and employee obligation is also composed of four dimensions including self-safety, public safety, loyalty and self-development. Finally, in view of the actual coal mine production, we suggests establishment of active psychological contract to enhance the coal mine safety management level.

Keywords: psychological contract; coal mine operators; organization obligation; employee obligation

1. Introduction

In recent years, coal mine accidents frequently happen in China, and coal mine operators have become a special group that attracts great public concern. The deep research about up-to-date China coal mine accidents indicates that coal mine operators’ unsafe behaviors are mainly responsible for coal mine accidents, and these unsafe behaviors feature universality, coherence and high frequency in daily production activities of various types of mines [1]. The document [1] also proves that coal mine operators’ sense of responsibility to the organization is the key factor to influencing their selection of safe behaviors, but the employee obligation is also the important content of psychological contract. So the study of coal mine operators’ psychological contract is the key condition to grasp the form and selection about coal mine operators’ behavior motivation and orientation, which has important implication to enhance the safety management by Chinese coal enterprises, helping to reduce unsafe behaviors and enhance mine safety.

2. Review of researches

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“Psychological contract is various faiths about obligation between individual and organization that individual employee takes the employment relationship as the background and takes promise, trust and perception as the bases”. For the content, psychological contract may include thousands upon thousands items which are impossible and unpractical to be listed completely [3]. Early research about psychological contract content emphasized employees’ requirements to the organization and organizational requirements to employees. Rousseau [2] was one of the few scholars who completely studied the content of employee psychological contract not only from employee obligation but from employer obligation. Herriot, Manning and Kidd completely researched the content of psychological contract not only from bilateral obligation but from both parties’ views [4]. Chinese scholars Chen Jia-zhou et al summarized the representative research results of psychological contract organization obligation content, which had important reference values for later researches [5]. Generally speaking, most researches about the content of psychological contract centralized in the organization obligation such as salary, reward, and welfare and occupation development in the employee psychological contract. Because the survey objects are different, also the organization obligations in employee psychological contract also vary.

In recent years, many scholars think that the contents of psychological contract have been largely changed under the background of global competition and technical innovation. The contents which were very important in the past have been gradually disappearing or become secondary. At the same time, some new contents such as the requirements of flexibility, work abundance and self independence are occupying more and more proportions in psychological contract.

After reviewing many research results about the structure of psychological contract, we conclude that the structure of psychological contract mainly include three sorts.

The first sort is the two-dimensional structure. Many researchers hold this opinion. This structure was first put forward by Macneil who thought the contract relationship included transactional component and relational component [6]. Robinson, Kraatz and Rousseau analyzed, “organization obligation” and “employee obligation” and found out two obvious factors, i.e. transactional factor and relational factor. Through two and a half years’ follow-up research, they proved that these two factors were stable [7]. Robinson & Morrison’s researches validated this result of factor analysis, but the contents included in various factors were little different [8].

The second sort is the three-dimensional structure. Though most scholars’ researches supported the existence of two dimensions, i.e. “transactional factor” and “relational factor”, some other scholars put forward exceptions. Rousseau & Tijoriwala studied the group of US enrolled nurses and put forward that three dimensions including transactional dimension, relational dimension and team player dimension might be included in the psychological contract [9]. Lee & Tinsley explored the structure of psychological contract in the work team of Hong Kong and US, and they supported Rousseau’s theory of three-component [10].

The research about psychological contract based on Chinese background is still in the exploring stage, and existing literatures are centralized on studying the contents and structure of psychological contract for groups such as general employees, managers, knowledge employees, and R&D personnel. Li Yuan investigated 769 general employees in various types of enterprises, and he thought the employee psychological contract included normal type, human relation type and development type [11]. Wei Feng investigated 512 MBA students and managers in various types of enterprise and educated the manager psychological contract included three dimensions, i.e. tool type, relation type and management type [12]. Chen Jia-zhou divided the employee psychological contract into two dimensions including practical factor and developmental factor [13]. Zhu Xiao-mei and Wang Chong-ming investigated 562 knowledge employees and utilized the factor analysis method to obtain that the psychological contract of knowledge employee in China was three-dimensional structure, and the organizational obligation included material encouragement, environment support and development opportunity, and the employee obligation included normal obeying, organizational identification and creation guidance [14]. Guan Pei-lan thought the R&D personnel psychological contract was composed by performance reward, career development and work-living balance through 160 questionnaires of R&D personnel in 8 enterprises in Wuhan and Shenzhen [15].

From the research actuality of the content and structure dimension of psychological contract, we can find that the concrete content and factor structure of the contract are not stable, because the social development makes the mode of organizational operation largely change and traditional “contract” content has been relatively changed, and many relative factors such as concrete social environment, economic environment and culture also will influence the concrete content and structure of the contract.

Though scholars have made many researches to the employee psychological contract in general organizations,
there are few empirical researches specially aiming at coal mine operations in coal enterprises. So in this article, we will adopt the confirmatory factor analysis method and the second-order factor analysis method to empirically study the content and structure of coal mine operator psychological contract in Chinese coal enterprises.

3. Design of the research

3.1. Hypothesis of coal mine operators’ psychological contract model

In the research of the production management situation and the interview with relative personnel in coal enterprises, we found that except for general contents of psychological contract, coal operators more often mentioned the responsibilities about safety production such as “operation following regulations”, “ensuring their own safety under the well”, “disobeying rude command” and “reminding other workers when they are in unsafe state or rude operation”, which indicates that certain bases of employee safety behavior management has been established in coal enterprises, and most employees have developed the cognition that safety was employees’ obligation in the psychological contract.

Therefore, except for general contents which should be included in the psychological contract, we increase the relative contents about organizational safety guarantee obligation and employees’ safety obligation according to the special situation of the coal mine in the design. We suppose the structure is seen in Fig. 1.

Fig. 1. Coal enterprise mine operators’ psychological contract concept model

The model indicates that: the coal mine operators’ psychological contract includes two contents, i.e. organization obligation and employee obligation; the coal mine operators’ psychological contract (organization obligation) is composed by production guarantee obligation, growth guarantee obligation, organizational development obligation, and organizational respect obligation assumed by the organization; the coal mine operators’ psychological contract-employee obligation is composed by self-safety obligation, public safety obligation, loyalty obligation and development obligation assumed by employees. Based on that, we put forward following research hypotheses.

H1: The coal mine operators’ psychological contract is composed of organization obligation and employee obligation in China’s coal enterprises.

H1A: Organization obligation is composed of four obligation factors including production guarantee obligation, growth guarantee obligation, organizational development obligation, and organizational respect obligation assumed by the organization.

H1B: Employee obligation is composed of four obligation factors including self-safety obligation, public safety obligation, loyalty obligation and development obligation assumed by employees.

3.2. Questionnaire

The questionnaire of psychological contract is formed by summarizing relative scholars’ research results [2, 5, 16] and mine operators’ statements about relative contents of psychological contract and combining the interviews with managers and workers. After composing the pre-test questionnaire, we investigated in Linhuan Coal Mine of Anhui
Huaibei Mining Group aiming at the questionnaire, and modified it according to various feedback, and finally formed the “mine operators’ psychological contract questionnaire” which included 33 items of organization obligation and 18 items of employee obligation, and the questionnaire adopts Likert 5 points scale and 1~5 denoted the degree gradually increases.

3.3. Implementation of survey research

According to the Employees’ Musts offered by the surveyed enterprise, we selected representative survey samples according to many dimensions including work type, education level, age, service length, and labor form, and organized informants to fill in the questionnaire under the assistance of the enterprise. To ensure the quality of the questionnaire, we adopted centralized assistant questionnaire survey, and the survey group members explained the questionnaire before the survey was implemented, and the members would answer informants’ various problems in the survey process at any moment. Through this method, the return rate and the validation of the questionnaire were higher. The concrete survey samples and questionnaire return rate were seen in Table 1.

Table 1. Samples of survey research

| Name of coal mine                              | Quantity of surveyed samples | Quantity of available samples | Availability of samples (%) |
|------------------------------------------------|------------------------------|------------------------------|-----------------------------|
| Wanbei Coal Electricity Group Co. Renlou Coal Mine | 100                          | 98                           | 98                          |
| Wanbei Coal Electricity Group Co. Qidong Coal Mine | 126                          | 114                          | 90.5                        |
| Yankuang Group Dongtan Coal Mine                | 126                          | 114                          | 90.5                        |
| Yankuang Group Nantun Coal Mine                 | 234                          | 232                          | 99.15                       |
| Huaibei Mining Group Yangzhuang Coal Mine       | 140                          | 136                          | 97.14                       |
| Huaibei Mining Group Luling Coal Mine           | 197                          | 177                          | 89.85                       |
| Total                                          | 923                          | 871                          | 94.37                       |

4. Data analysis

4.1. Questionnaire validity test

The research utilizes the main component analysis method to implement validity test. The main method and approaches include orthogonally rotating to abstract factors according to the principle that the latent root exceeds 1 and the maximum varimax method, then reviewing the load value of the measurement item (factor) of every concept. Comry pointed out that when the load of the factor analysis exceeded 0.71, it was thought as excellent, and when this value exceeded 0.63, it was thought as very good, and when this value exceeded 0.55, it was thought as good, and when this value exceeds 0.45, it was thought as acceptable, and when this value exceeded 0.32, it was thought as bad. According to this standard, we eliminate the items whose load is smaller than 0.45, and keep the items with relatively higher load (Price, 1997) [17].

Factor 1 of organization obligation: The variance explanation quantity of the production guarantee obligation is 41.8%, and the factor loads of composing items include work time (0.724), work intensity (0.714), tools and equipments (0.608), work monotony (0.6) and work environment (0.572), and the reliability is 0.64.

Factor 2 of organization obligation: The variance explanation quantity of the growth guarantee obligation is 51.0%, and the factor loads of composing items include the salary and benefit increase matching (0.656), enjoyed insurance (0.655), salary and labor matching (0.652), work stability (0.629), training status (0.582), rewards and performance matching (0.564), right to refuse illegal command (0.557), definite worker admittance system (0.541), right to refuse operation with hidden risks (0.493), obeying encouragement (0.462) and employment attribute conversion (0.418) and post promotion (0.384), and the reliability is 0.80.

Factor 3 of organization obligation: The variance explanation quantity of the organization development obligation is 54.6%, and the factor loads of composing items include safety management system (0.669), rewards and punishment system (0.655), “three-violation” management system (0.648), normative punishment (0.601),
examination system (0.5585), working task checking (0.542), safety atmosphere (0.487) and management performance (0.485), and the reliability is 0.72.

Factor 4 of organization obligation: The variance explanation quantity of the organizational respect obligation is 44.1%, and the factor loads of composing items include living establishment (0.768), respect (0.735), hearing employees’ opinions (0.729), communication (0.679), industrial injury and illness compensation (0.658), solving living difficulty (0.611), justice (0.551), organizing entertainment and sports (0.547), and the reliability is 0.81.

Factor 1 of employee obligation: The variance explanation quantity of the self-safety obligation is 51.9%, and the factor loads of composing items include performing post obligation (0.787), obeying rules (0.758), actively finding hidden troubles (0.725), obeying operation regulations (0.704), actively enhancing work skills (0.679), assuming safety obligation (0.663), and the reliability is 0.81.

Factor 2 of employee obligation: The variance explanation quantity of the public safety obligation is 48.4%, and the factor loads of composing items include deterring other illegal behaviors (0.768), refusing illegal command (0.749), disclosing illegal command (0.694), conformity behavior (0.553), and the reliability is 0.63.

Factor 3 of employee obligation: The variance explanation quantity of the loyalty obligation is 48.4%, and the factor loads of composing items include interests consistent (0.765), reasonable advices (0.738), maintaining organizational benefit (0.685), obeying organizational arrangement (0.632) and long-term work (0.553), and the reliability is 0.70.

Factor 4 of employee obligation: The variance explanation quantity of the development obligation is 53.8%, and the factor loads of composing items include being concerned about organizational development (0.836), contribute to the safety (0.792) and self-development (0.535), and the reliability is 0.54.

The test results of validity and reliability show that the items of “employment attribute conversion” and “post promotion” in the factor of growth guarantee about organization obligation didn’t pass the test, and they should be eliminated in the model validation. The organization obligation of psychological contract is composed of four dimensions including production guarantee, growth guarantee, organization development and organization respect, and the employee obligation is composed of four dimensions including self-safety, public safety, loyalty and development. And whether these structures are reliable and effective or not, we need to implement confirmatory study for the hypothesis of the model.

4.2. Confirmatory study

We use software LISREL to respectively implement confirmatory factor analysis and second-order factor analysis, and validate the concept model and the research hypotheses. Starting from the concept model, the confirmatory study fits the observation data and the concept model, and tests the support degree of the observation data to the model. And the second-order factor analysis explores the more exact and simple model based on the significant correlations among factors and the situation that the first-order factor model can be well fitted. Through the study, we respectively obtain the fitting degree indexes (seen in Table 2) of the first-order factor model (Ma) and the second-order factor model (Mb) of the organization obligation, and the fitting degree indexes (seen in Table 3) of the first-order factor model (Ma) and the second-order factor model (Mb) of the employee obligation.

Table 2. Fitting indexes of observation data and theoretical model for China coal mine operator psychological contract (Organization obligation)

| Model | DF | X2   | P   | NFI | NNFI | CFI | IFI | GFI  | AGFI | RFI  | RMR  | RMSEA |
|-------|----|------|-----|-----|------|-----|-----|------|------|------|------|--------|
| Ma    | 428| 843.85 | 0.0 | 0.916 | 0.954 | 0.958 | 0.857 | 0.834 | 0.909 | 0.0582 | 0.0547 |
| Mb    | 430| 862.02 | 0.0 | 0.915 | 0.953 | 0.957 | 0.854 | 0.831 | 0.908 | 0.0594 | 0.0556 |

There are many indexes to measure the quality of the model, and the popular indexes are seen in Table 2, where, $\chi^2 / df$ is an important index. And the value of $\chi^2 / df$ is closer to 0, it indicates the fitting degree of observation data and the model is better. When $\chi^2 / df < 3$, it denotes the whole model has very good fitting degree. And when $\chi^2 / df < 5$, it denotes the whole model is fitted well and the model can be accepted. And when $\chi^2 / df > 10$, it denotes the whole model is very bad.
Table 3. Fitting indexes of observation data and theoretical model for China coal mine operator psychological contract (employee obligation)

| Model | DF  | X²  | P   | NFI | NNFI | CFI | IFI | GFI | AGFI | RFI | RMR | RMSEA |
|-------|-----|-----|-----|-----|------|-----|-----|-----|------|-----|-----|--------|
| Mc    | 113 | 276.240 | 0.0 | 0.948 | 0.963 | 0.969 | 0.909 | 0.877 | 0.937 | 0.0515 | 0.0667 |
| Md    | 131 | 323.246 | 0.0 | 0.940 | 0.958 | 0.964 | 0.964 | 0.900 | 0.870 | 0.930 | 0.0545 | 0.0672 |

Steiger and Lind put forward the adjusted index, RMSEA (root mean square error of approximation) [18], and Steiger thought that the situation that RMSEA was less than 0.1 represented good fitting, and the situation that RMSEA was less than 0.05 represented very good fitting, and the situation that RMSEA was less than 0.01 represented very excellent fitting [19].

Bertler and Bonett put forward the index of NNFI (non-normalized fit index) which would exceed the range of 0~1 because of the fluctuation of the samples. Therefore, they further put forward the index NFI (normalized fit index) whose value range was 0~1, where, NFI=1 corresponded with the best fitting, and NFI=0 corresponded with the worst fitting [20].

International famous psychological publication, “Psychological Bulletin” pushed two relative fitting indexes simultaneously in its second volume of 1990, where, Bentler put forward the index of CFI (comparative fit index) which mainly reflected the relative fitting degree between the tested model and the model which variables were completely restrained. When the value of CFI exceeds 0.9, it indicates the model can be accepted [21].

GFI and AGFI reflect the absolute fitting goodness of the model, and when these indexes are higher, the fitting of the model is better. Hair Joseph F. et al thought that when GFI and AGFI exceeded 0.90, it indicated the fitting degree of the model and data was very good, and when this value exceeded 0.80, it indicated the fitting degree is good [22].

From Table 2 and Table 3, we can see that the $\chi^2/df$ values of Model Ma, Model Mb, Model Mc and Model Md respectively are 1.97, 2.0, 4.23 and 2.46, and the P values of these models are significant, and the values of NFI, NNFI, CFI, IFI (increment fitting index), RFI (relative fitting index) and GFI (goodness of fitting index) all exceed 0.9, and the value of AGFI (adjusted goodness of fitting index) is also close to 0.9, and the point evaluation values of RMR (root mean residual) and RMSEA (root mean square error of approximation) are all less than the critical level of 0.1, which indicates the fitting degree of the model and the observation data is good. At the same time, the model fitting result shows there is no better modification advices.

5. Analysis and discussion

Through the confirmatory factor analysis and second-order factor analysis, we obtain the four-dimensional structure model of coal enterprise mine operators’ psychological contract. Fig. 2 described the confirmatory research model of mine operators’ psychological contract organization obligation, and Fig. 3 described the confirmatory research model of mine operator’s psychological contract employee obligation.

Factor 1 of organization obligation is composed of five observation variables including “work environment”, “tools and equipments”, “work intensity”, “work monotony” and “work time”, which are contents directly related to the production operation, and they are anticipations about improving mine work environment, renovating equipments and reasonably arranging work time, intensity and contents, which matches with the actual production situation of Chinese enterprises, for example, the mine operation environment is bad (dark, dust, high temperature, high moisture and multiple dangerous factors), and part of mine equipments which have been used for a long time are renovated slowly (disqualified tools and equipments become one source of danger for production under the mine), and the work time of mine workers is long and workers’ work intensity is large (most miners say their work time every shift exceeds 8 hours). Factor 1 reflects the basic necessary guarantees that coal enterprises should offer for the safety production in the mine, i.e. the “production guarantee obligation” that employees hope the enterprise should assume.

Factor 2 of organization obligation is composed of ten observation variables including “employment admittance”, “training”, “work stability”, “salary and labor matching”, “salary and enterprise benefit increase matching”, “insurance”, “rewards and performance matching”, “right to refuse illegal command”, “right to refuse illegal...
operation” and “obeying encouragement”. “Salary, rewards and insurance” are highly concerned elements by mine operators, and most mine operators think that “their labors don’t match with their salaries, and with the increase of enterprise benefit, their salaries don’t increase correspondingly”, and the payoff of the rewards usually adopts the form of “department unification”, but works thing the reasonable salaries and insurances according to the regulations are the obligation that the enterprise should assume. In recent years, because most digging employees in the front line of coal enterprises are farmer contract workers, the operators’ skills and quality have become important factors of safety production. The non-scientific and non-normative employee references and the formalization of training make mine operators gradually recognize that the enterprise should strengthen the standardization of personnel admittance and the science and practicability of operator training. At the same time, because short-term contracts make part of contract-operators have no stable security of occupation, they think the organization should ensure employees’ work stability and could not fire them at will. Managers’ “illegal command of production against regulations” and workers’ behaviors of “passively implementing illegal operation” are important reason to induce the coal accidents, so the Chinese government regulated mine operators’ “ten rights (in June of 2006, China State Administrative Bureau of Safety Production Supervision issued “Guided Opinions on Strengthening the Safety Base Administration of Key State-owned Coal Mines” with seven other Ministries and endowed ten items of right under the mine)”, so mine operators’ “refusing to obey illegal command and illegal operation” is the obligation that coal enterprises should assume to ensure employees’ legal rights. Because this series of observation variable all come down to individuals’ work developments and corresponding safety rights in the organization, so we name them as “growth guarantee obligation”.

Fig. 2. (a) Confirmatory factor analysis result of organization obligation (Ma); (b) Second-order factor model complete standardization decomposing of organization obligation (Mb)

Note: Z-Y: organization obligation, SCBZ: production guarantee obligation, CZBZ: growth guarantee obligation, ZZFZ: organization development obligation, ZZZZ: organizational respect obligation, SCBZ-1: operation environment, SCBZ-2: tools and equipments, SCBZ-3: work intensity, SCBZ-4: work monotony, SCBZ-5: work time, CZBZ-1: worker admittance system, CZBZ-2: training status, CZBZ-3: work stability, CZBZ-4: obeying encouragement, CZBZ-5: salary and labor matching, CZBZ-6: salary and benefit increase matching, CZBZ-7: insurance, CZBZ-8: bonus and performance matching, CZBZ-9: right to refuse illegal command, CZBZ-10: right to refuse illegal operation, ZZFZ-1: examination system, ZZFZ-2: rewards and punishment system, ZZFZ-3: management performance, ZZFZ-4: safety atmosphere, ZZFZ-5: safety management system, ZZFZ-6: Normative punishment, ZZFZ-7: “three-violation” management system, ZZFZ-8: working task examination, ZZZZ-1: industrial injury and illness compensation, ZZZZ-2: solving living difficulty, ZZZZ-3: living establishment, ZZZZ-4: organizing entertainment and sports, ZZZZ-5: hearing employees’ opinions, ZZZZ-6: respect, ZZZZ-7: communication, ZZZZ-8: justice.
Factor 3 of organization obligation is composed by eight observation variables including “examination system”, “rewards and punishment system”, “management performance”, “safety atmosphere”, “safety management system”, “normative punishment”, “three-violation management system” and “working task checking”, and it is mainly concerned about standardizing and improving various management systems of enterprises, ensuring the effective execution of the system, and constructing active safety culture and other various kinds of factors which can influence the sustainable development of the enterprise and further influence employees’ various rights and obligations in the organization. Employees of coal enterprises think that the existing systems have various deficiencies such as execution rigidity and indefinite principal part of the execution, so they think enterprises should assume “organization development obligation”.

Factor 4 of organization obligation is composed of eight observation variables including “industrial injury and illness compensation”, “solving living difficulty”, “living establishment”, “organizing entertainment and sports”, “hearing employees’ opinions”, “respect”, “communication” and “justice”, and they emphasize particularly solving mine operators’ fear of trouble in the rear and enhancing their living quality including sufficient industrial injury compensation, living assistance, good living establishment, abundant leisure, recognition of employees’ opinions, sufficient respect for mine operators, sufficient communication between leaders and employees, and anticipation of justice, so we name this factor as “organizational respect obligation”.

![Diagram](image-url)

Fig. 3. (a) Confirmatory factor analysis result of employee obligation (Mc); (b) Second-order factor model complete standardization decomposing of employee obligation (Md)

Note: ZZAQ: self-safety obligation, GGAQ: public safety obligation, ZCZR: loyalty obligation, FZZR: development obligation, ZZAQ-1: assuming safety obligation, ZZAQ-2: obeying rules, ZZAQ-3: obeying operation regulations, ZZAQ-4: actively finding hidden troubles, ZZAQ-5: performing post obligation, ZZAQ-6: actively enhancing work skills, GGAQ-1: disclosing illegal command, GGAQ-2: refusing illegal command, GGAQ-3: deterring others’ illegal behaviors, GGAQ-4: conformity behavior, ZCZR-1: obeying organizational arrangement, ZCZR-2: interests consistent, ZCZR-3: reasonable advice, ZCZR-4: long-term work, ZCZR-5: maintaining organizational benefits, FZZR-1: being concerned about organizational development, FZZR-2: contribute to the safety, FZZR-3: self-development.

Factor 1 of employee obligation is composed of six observation variables including “assuming the sense of safety obligation”, “obeying rules”, “obeying operation regulations”, “actively disclosing hidden troubles”, “performing post obligation” and “actively enhancing work skills”, and it is employees’ obligation which should be assumed in the aspects of enterprise safety and development as viewed from individual consciousness and actions, so it is called as “self-safety obligation”.

Factor 2 of employee obligation is composed of four observation variables including “disclosing illegal command”, “refusing illegal command”, “deterring others’ illegal behaviors” and “conformity behavior”, and they all emphasize particularly the public obligation of organization safety including disclosing manager’s illegal commands, refusing and deterring manager’s illegal commands, deterring fellow illegal behaviors and the obligation consciousness and cognition of refusing illegal command in concrete situation, so we name the Factor 2 as “public
Factor 3 of employee obligation is composed of five observation variables including “obeying organizational arrangement”, “interests consistent”, “reasonable advices”, “long-term job” and “maintaining organizational benefits”, and they all emphasize particularly on the loyalty obligation including obeying organizational arrangement without conditions, integrating self benefits with organizational benefits, putting forward reasonable advices, keeping on working in the mine and the obligation consciousness and cognition, so we name the Factor 3 as “loyalty obligation”.

Factor 4 of employee obligation is composed of three observation variables including “being concerned about organizational development”, “contribute to the safety” and “self-development”, and they all emphasize particularly the contribution obligation of employees to the organizational development and organizational safety and the grasp of employees to their self development including being concerned about organizational development, contribution to organizational safety and confirming the obligation consciousness and cognition of development aim, so we name Factor 4 as “development obligation”.

Through the research in the article, we can see that mine operators of coal enterprises are obviously different from general enterprise employees. Existing researches indicate that the mutually influencing relationship between organization obligation and employee obligation in psychological contract, so we can adopt pertinent encouragement measures to prompt that mine operators actively assume employee obligation and select safe operation behaviors through grasping the content and structure of mine operator psychological contract. Combining with the interview with coal operators, we put forward following advices.

The production guarantee obligation is the basic guarantee which should be offered by the coal enterprise to ensure the safety of mine production. To increase safety devotion and improve operation environment and production equipments is the important work to be implemented by coal enterprise as soon as possible, and the coal enterprises should increase the guarantee measures avoiding employees’ injury in the production process from various aspects. And the coal enterprises should also implement national industrial macro requirements, improve the labor organization, and put “four-six shift system (each team works 6 hours one day)” into practice in the front line, and take measures to stop extending employees’ workdays.

The growth guarantee obligation is the basic guarantee obligation which should be assumed by the coal enterprise for the employees’ growth in the organization. The coal enterprises should standardize the employment admittance system and establish the employee selection system based on post competence. The management should not think that the organization could infinitely consume employees’ finite strengths, but that the organization develops and cultivates employees’ infinite potentials in the process of implementing the aim of the management. So the enterprise should offer various employee trainings, really enhance employees’ production and technological ability, and offer basic conditions for employees’ growth in the organization. Some enterprises should change the present short-term contract system between enterprises and “rural workers”, standardize and execute various employee insurance policies to strengthen employees’ relation senses. According to national macro guidance, the coal enterprises should put the salary system in order, enhance the labor allocation proportion, establish scientific and reasonable salary system as soon as possible, gradually enhance employees’ incomes, and make employees really feel the competence and coherence between the increase of enterprise benefits and the increase of employee benefits.

The organization development obligation is the basic obligation which should be assumed by the coal enterprises to continually enhance the economic benefits and management efficiency. However, at present, the efficiency of existing systems is low, and conflicts among concrete systems often occur in the same system, and the system execution always violates the “human-oriented spirit”, so the system arrangement of enterprise should be urgently changed to bring various systems into uniform logic frame and form a systematic system with mutual support characters.

The organizational respect obligation is the relative obligation about improving employees’ living conditions and emphasizing employees’ opinions which should be assumed by the coal enterprises. To offer good living establishments and solve employees’ living difficulties is the first obligation and the problem which should be fully concerned by present coal enterprises. The coal enterprises should organize formal or informal communications among different layers, establish the public information communication platform, and change employees’ prejudices and thinking patterns such as “miners have low quality” and “miners work only for money”. Managers’ ignorance to employees’ feeling and real demands is one of the important reasons for the mine operator psychological contract
violation, and managers should emphasize communication and actively build the atmosphere of communication, and make employees understand the aim of the enterprise and combine the aim with their individual spirit, faith and career. Only to understand each other, continually adjust both cognition behaviors and benefits, and implement the behaviors which can fulfill each others’ demands, it can harmonize both anticipations.

In this article, we empirically study the content and structure of mine operators’ psychological contract and the actuality of mine operators’ psychological contract, the function relationships between organization obligation and employee obligation and the interior association of psychological contract and behavior safety are important problems which should be further studied and solved by us. And we hope research of this article could offer more effective methods to support mine operators’ behavior safety management in coal enterprises.

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