

# Prevention and Countermeasures of the Human Capital Burnout for the Air Traffic Control Department of China

Mo Guoyong

School of Management, Wuhan University of Technology, Wuhan, P.R.China, 430070

(E-mail: 342895349@qq.com)

**Abstract:** Since 2010, the industry of China's civil aviation is entering a new peak of development, leading to enormous pressures to various systems of the civil aviation industry. As an important component of the China's civil aviation (CCA), the air traffic control (ATC) system directly affects the overall operation of the CCA. In this paper, we introduce the concept of occupational burnout of human capital occurring in ATC department, according to the nature of the CCA. Various levels, including individual level, professional level and organizational level, are investigated to reveal the causes of the occupational burnout of human capital in ATC department, resulting in the formation of effective approaches, and eventually a complete system for the targeted control and prevention of the occupational burnout, with the aim of curbing occurrences of the occupational burnout and promoting long-term development for the CCA.

**Key words:** Occupational burnout; ATC department; Analysis of causes; Pre-control measures; Pre-control system

## 1 Introduction

With the continuous development of the aviation industry, China has become one of the major powers of the world's air transport. The ATC employees are subjected to tremendous work pressures under the increasingly busy air transport. Part of the employees, who experiences high pressures for long periods of time are prone to burnout, which lead to the emergence of high turnover rate of the ATC employees, and also lead to the occurrence of operational errors and so on. Thus, it is required for the ATC departments to take actions to prevent occupational burnout to ensure the safety of air traffic services. In the civil aviation industry, it is generally believed that human errors have become an important factor for the aviation safety. It is reported that from the early stage till now, the aviation accidents have been dramatically increased from 20% to 80%, and the man-made factors have become the rate-limiting step for the civil aviation security level. In recent years, there is a growing number of security incidents occurred due to the mishandling of the ATC employees caused by the occupational burnout. For these reasons, this article examines various levels (including individual level, professional level and organizational level) to investigate the causes of the occupational burnout occurring in ATC department. Finally the formation of effective approaches, and eventually a complete system for the targeted control and prevention of the occupational burnout are established, with the aim of curbing occurrences of the occupational burnout and promoting long-term development of the civil aviation industry.

## 2 The Causes of Occupational Burnout of Human Capital Occurring in ATC Department

When working under high-intensity pressure, the ATC employees tends to burnout, which may generates a threat to the safe operation of the aviation industry. Thus, it is required for the ATC employees to have abundant energy and physical strength to overcome the tremendous work pressure, as well as to resist the emergence of job burnout. From the individual level, professional level and organizational level, this article analyzes the causes of burnout in ATC department and reveals specific reasons for the formation of occupational burnout.

### 2.1 Individual level factors

A qualified ATC employee must have versatile talents, not only solid and professional skills, but also excellent learning abilities. Since a long time ago, there were varying skill levels presenting among the ATC employees, and this is also accompanied with the out of date in professional knowledge, and the occurrence of relatively weak understanding of the basic knowledge. Along with the emergence of updated ATC equipments and the continuous investment in new technologies, control of the working quality of employees have become increasingly demanding. After the implementation of radar control, a large amount of additional works, such as the annual refresher training of radar control simulation, and

license checks and examinations, may take a lot of non-normal working hours to complete. As the age increases of ATC employees, heavy psychological burden is induced by the rapid development of new technologies, resulting in psychological anxiety and frustration, loss of confidence in the work, and eventually the occupational burnout.

### **2.2 Factors in occupational level**

The primary responsibilities of the ATC are to ensure successful implementations of a variety of aviation missions, to keep orders in the air, to resolve conflicts and to prevent flight accidents. For ATC employees, to provide a safe and secure aviation environment is their major work. Moreover, flight accidents often occur in an instant. In order to detect and stop the flight conflicts timely and effectively, it is required for ATC employees to maintain a high level of understanding of timeliness. Employees should be able to make timely and correct orders to the aircraft in a limited period of time, and keep everything under control, thus an aviation task is considered completed. However, to accomplish these complicated and tough tasks, employees will be subjected to super high pressure, resulting in dual challenges to mental and physical strength. In particular, employees not only are required to keep constant attentions to the aircraft or radar signals, while maintaining communication and coordination with the flight crew. Thus, it is easy for the ATC employees to have occupational burnout due to their professional characteristics.

### **2.3 Organizational level factors**

The ATC department does not have effective psychological relief strategies for human capitals. According to a survey from the General Administration of CCA<sup>[1]</sup>, 47% of the ATC employees have varying degrees of psychological symptoms or underlying psychological symptoms. However, the strategies to provide psychological relief for employees remain in a preparatory state. Although the presence of regular or unscheduled psychological training programs in some ATC departments, they become a mere formality. There are a number of ATC employees, who have mental confusion, are not promptly relieved and slowly become mental impairment or burnout syndrome, which may increase the occurrence of human errors and eventually a direct rise in security incidents. In addition, current attention of career development plans for ATC employees is very low, especially the absence of clear career development plans for front-line employees. Although those employees are generally promoted in professional titles, their career development plans remain in a natural state. When the requirements are not met and under a confusing state for career development, these employees will have the intention of leaving. Since the ATC department can not provide good development opportunities, it brings about a strong sense of frustration to employees. Together with the tremendous work pressure, superimposed on a variety of negative emotions and the absence of necessary mechanisms for heart relieve tend to induce the occurrences of occupational burnout.

## **3 Analysis of Pre-control Measures of Human Capital Burnout in ATC Department**

After analyzing the causes of human capital burnout in ATC department, we introduce prevention and control measures for occupational burnout from various levels (including individual level, professional level and organizational level), which are further combined with early warning system of human resources for real-time monitoring, in order to curb occurrences of the occupational burnout. The following will explain it one by one.

### **3.1 Pre-control measures in individual level**

ATC employees should continue to improve their skills, learning new knowledge, new skills, understanding of contemporary and the latest development of ATC technologies, forming of an integrated knowledge structure and dialectical thinking, broadening their conversation areas, and keeping a good attitude. According to the survey<sup>[2]</sup>, the person who has a good interpersonal relationship, when facing significant pressure, will have less depression than the people with poor social relations. Because of the relative closed environment and less access to social contacts, many long-term ATC employees appear less in words and form an introverted personality. Meanwhile, the heavy work pressure tends to bring all sorts of diseases, which requires conscious control of personnel and their relatives, friends, colleagues, subordinates and other people to establish good interpersonal networks.

### **3.2 Pre-control measures in professional level**

ATC employees should enhance their ability to handle special situations. In order to form a continuity of thought, logical, meticulous and comprehensive thinking, it is essential to strengthen day-to-day business learning, to improve skills and develop good work habits. To develop a rigorous

working style, employees should be able to keep a stable state of mind under special circumstances, busy but not messy, staying calm within chaos, succeeding with assurance. Moreover, ATC employees have to persist in learning new technologies, improving their skills, enriching themselves and enhancing self-confidence, from a subjective sense to form a state of psychological advantage. ATC employees should have a clear idea of the complex factors, such as flight traffic, weather conditions, air force exercises, important notices and flow control, in the course of flying. Always be prepared and keep a positive attitude in the daily work, can effectively reduce the psychological pressure. Only in this way, in the presence of complex and difficult tasks, one can ignore pressure and keep peace in mind to deal with working problems, thus effectively reducing the probability of flight accidents induced by human factors.

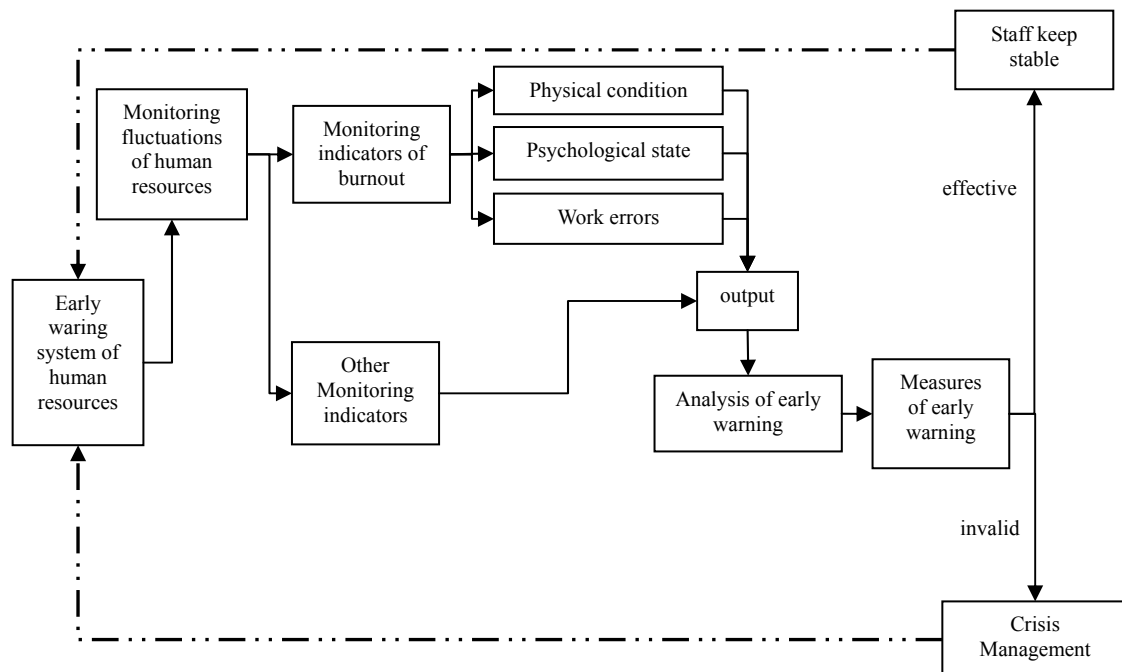
### **3.3 Pre-control measures in organizational level**

ATC department can determine the strengths, weaknesses, and occupational requirements of employees, through self-evaluation, environmental analysis and other activities, as well as performance appraisal and career test. Meanwhile, when acquiring the in-depth analysis of the surrounding environment of employees, ATC department can guide their vocational orientation, career development and goals, according to the characteristics of employees and their surrounding environment. With the agreement of both employees and their higher authorities, activities related to career planning and career development of employees can be actively pursued and be recorded into the career development plans. Thus, as a result of implementation of these career plans, the sense of confusion and frustration for their own situation and future development can be alleviated. In addition, ATC department can provide a series of timely psychological training to slow down appearance of occupational burnout and effectively reduce the work pressure of employees, thus inhibiting occupational burnout.

### **3.4 System construction of prevention and control of human capital burnout in ATC department**

In this paper, the causes of occupational burnout in ATC department are summarized in detail from individual level, professional level and organization level. Based on these, we obtain specific prevention and control measures for occupational burnout from various levels (including individual level, professional level and organizational level). Form a further deep analysis of the causes of occupational burnout, we repair the warning systems for human resources burnout in ATC department, focusing on psychology, behavior, work status and other indicators of employees to monitor and detect abnormal indicators to ensure timely diagnosis. Finally, prevention and control measures should be provided to resolve the aviation safety risks induced by human factors. However, the early warning for burnout prevention and control is missing in this system. To deal with this problem, based on the characteristics of the work and operation system in ATC department, we build up an early warning model for the management of occupational burnout and propose a number of early warning indicators for occupational burnout as shown in Figure 1.

The establishment of early warning indicators for occupational burnout is based on the environment of early warning systems for human resources<sup>[3]</sup>. The dashed line in Figure 1 shows the transmission management of early warning information. When the early warning indicators of occupational burnout (mental state, physical condition and working errors) go beyond a reasonable level, in which the system will automatically recognize the early warning level and control access to the next link via the post-output analysis to send out early warning signals. Meanwhile, the system will search for the appropriately responding library program for prevention and control measures to assist ATC department a deal with occupational burnout, taking advantages of the existing pre-control measures for employees. When the pre-control measures take effect, it proves a success of the early warning management, as well as achieving a steady-state behavior of employees. In contrast, when the pre-control measures lose their effect, the signs of emotional imbalance, abnormal behavior and other related phenomena will occur. In this case, emergent measures with different degree of attitude and strength should be taken to deal with the crisis, according to the severity of the situation. If the problem is handled properly, the system will enter the steady-state behavior of employees. Otherwise, it may appear safety accidents. Learning from these crisis prevention measures, the system can further improve its control and countermeasures to take more effective strategies for prevention and control when encountered a similar problem.



**Figure 1 An Early Warning Model for the Management of Occupational Burnout in ATC Department**

#### 4 Conclusion

In this paper, we introduce the concept of occupational burnout of human capital occurring in ATC department, taking a widespread phenomenon as a starting point, the presence of high pressure for employees working in China's civil aviation. The causes of occupational burnout in ATC department are summarized in detail from individual level, professional level and organization level. After understanding the nature of the work for ATC employees, we obtain specific prevention and control measures for occupational burnout from various levels (including individual level, professional level and organizational level). Thus, a system for prevention and control of occupational burnout in ATC department is established, in the aim of effectively curbing the formation of occupational burnout, reducing occurrence of staff turnover and mis-operations, and eventually promoting the long-term development for CCA.

#### References

- [1] Yanni Xu, Fan Luo. The Use of Psychological Contract Incentives to Improve Air Traffic Controllers [J]. Civil Aviation of China, 2007 (11) .112-117(In Chinese)
- [2] Yanzhi Wang. China's Air Traffic Controllers Stress Management Research [J]. Wuhan University of Technology. Master's thesis, 2007 (5) .25-28(In Chinese)
- [3] Fan Luo, Li Zhao. China Airlines Human Resources Crisis Management Early Warning System [J]. Wuhan University of Technology: Information and Management Engineering Edition, 2008 (2) .28-31(In Chinese)
- [4] Maslach C., Jackson S. E. The Measurement of Experienced Burnout[J].Journal of Occupational Behaviour, 1981.2.99-113.17-21
- [5] Farber B. A. Crisis in Education. Stress and Burnout in the American Teacher [J]. SanFancisco, CA. 1991.56-61
- [6] The Practices Book of Aviation Enterprise Talent Training of Human Resources Recruitment and Selection of Evaluation Performance and Salary Management [M]. China Enterprise Management Publishing House,2009.21-25(In Chinese)