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Advancing Fire Management in the New Era: Toward Comprehensive Refinement and Inclusive Mobilization for Enhanced Operational Efficiency

Shan Jin[1], Zhaowen Su[2], Xueyi Jiang[3], Haichen Li[4]

[1]Beijing Xiao'an Fire Technology Service Co., Ltd., Beijing 100021
[2]China Railway Beijing Group Co., Ltd., Beijing 100055
[3]Beijing Jianyuan Jingcheng Engineering Consulting Co., Ltd., Beijing 100070
[4]Beijing Huozheng Fire Safety Technology Research Institute Co., Ltd., Beijing 100029

Abstract: ***This study examines the perceptions and expectations of diverse stakeholders in society with respect to contemporary fire management. By tracing the evolutionary trajectory of fire management practices in recent years, the paper proposes a progressive model that transitions from experience-based approaches to evaluation-driven upgrading, and ultimately toward comprehensive refinement, decomposition, and systematic implementation. In parallel, the study synthesizes the roles, responsibilities, and obligations undertaken by relevant parties during the design and construction phases [1], alongside practical insights derived from fire management during the operational phase. It is posited that the advancement of fire safety management across various organizational units necessarily depends on the adoption of a comprehensively refined and decomposed management model. This paradigm not only enhances operational precision but also serves as a foundational pathway for institutionalizing fire safety performance.***

1. INTRODUCTION

Firefighting work is an indispensable and important part of social production and life. However, different social units adopt different firefighting work methods, making it difficult to uniformly evaluate the quality of unit fire management and form a unified recognition in people's minds. Based on years of experience in directly and indirectly promoting unit fire management (sometimes referred to as fire safety management), this paper summarizes unique fire management experience and proposes that unit fire management must establish a mechanism of comprehensive refinement, decomposition, and extensive mobilization to exert more efficient practical effects and curb fires. This experience summarizes a path for improving fire management in various social units that is easy to operate and implement, especially solving grassroots problems such as the difficulty in mobilizing more cadres and the masses to participate in fire management and the tendency for corruption due to arbitrary decisions by a few people, thereby promoting the overall efficiency of unit fire safety management and its integration into and improvement of overall enterprise management.

2. ANALYSIS OF THE COGNITIVE DEVELOPMENT AND INNOVATION NEEDS OF FIRE SAFETY MANAGEMENT WORK

2.1 Analysis of the Connotative Development of Fire Management Work:

With social development, all industries have undergone earth-shaking changes, significantly affecting the production and living forms and states of all sectors of society, and the same is true for fire work. The definition of fire work has not yet been unified; its expressions include "fire work", fire management, fire safety management, etc., but it can be divided into at least the following levels. First, do a good job in one's own fire safety management to ensure that the unit does not catch fire or smoke; second, do a good job in the management of the unit's fire facilities to ensure they can play an effective role and avoid being punished or criticized in various inspections; third, do a good job in fire administrative licensing and other active and passive legal work. Of course, it may also include more, such as establishing a proactive style for all staff. It is not difficult to see that fire work is a multi-dimensional task, so in daily work, there often occur situations where various subjects have inconsistent understandings, and thus evade or shirk problems. These characteristics are the prominent features of fire management, which also result in the uneven current situation of fire work in various social units, and even problems such as inconsistent attitudes and standards of supervision and inspection parties.

2.2 All sectors expect fire management requirements to be more unified and reasonable, both vertically and horizontally

With the continuous development and improvement of China's economic construction and legal awareness, all sectors of society have increasingly high expectations for the transparency, efficiency, and consistency of fire management. At the same time, all sectors also expect to have convenient channels to understand the significance and interpretation of various specific fire management requirements in advance. Business owners' expectations for the direct benefit analysis of comprehensive fire management investment have become more divided, and the call for a clearer, universal, publicly acceptable, and participatory fire management model has grown stronger. The full inspection method we proposed and practiced in several units just conforms to the trend, emerged as the times require, and has been widely recognized. Now we introduce it to all sectors, hoping to jointly promote industry development and the improvement of overall social safety efficiency.

3. THE IMPROVEMENT OF FIRE MANAGEMENT UPGRADES FROM EXPERIENCE MANAGEMENT PLUS EVALUATION AND IMPROVEMENT TO ACTIVE COMPREHENSIVE SORTING

By summarizing the fire management experience of many units in China since the founding of the People's Republic, especially in the past decade or so, we propose the concept that the comprehensive level of fire management can and must be quantified, and that the main management content can be made explicit and basically in place to achieve the intended benefits. To argue this concept in reverse, if certain aspects of fire work are done excellently, but if there is an oversight in a certain aspect that must be done well, it may destroy the considerable investment in other aspects, resulting in disaster losses or administrative penalties. Therefore, this method should adopt the approach of establishing an overall concept and decomposing and implementing it, so as to quantify and implement the fire management of units or localities. This method has not yet been officially named; based on its comprehensive content requirements, we tentatively call it the "Full-Table Status Layer-by-Layer Decrement Inspection and Supervision Method", referred to as the "Full Inspection Method" for fire protection

3.1 The basic method for comprehensive upgrading is comprehensive sorting, visualization, and decomposition for implementation

This method may have a vague corresponding awareness in other channels and scopes, including some members of the expert institution teams serving us, but in publicly verifiable channels, there has not yet been a systematic discussion and promotion. Therefore, we tentatively consider it as a method summarized, sublimated, original, and practiced by us. We hope to summarize and briefly introduce it to all sectors of society here, and throw out a brick to attract jade, openly seek flaws, hoping to eventually attract industry attention, research, verification or falsification for improvement, refinement and optimization, promotion and application, so as to better promote the efficient operation of fire safety management in the whole society and promote the development of China's economic construction.

In simple terms, this method divides the daily fire inspection and verification work that units need to carry out into two categories: the first type of items that are relatively easy to directly judge and the second type of items that require rich experience to judge, which can be approximately referred to as fixed items and flexible items. Fixed items are not fixed in other types, but fixed in content and state. In fact, they basically cover most daily fire inspections and the content that should be inspected to address the shortcomings in some current post-fire analyses. The overall framework is also basically consistent with all of the first and second sections and most of the third section required by Standard 3005, except that the depth, detail, and operability need to be further deepened. Flexible items mainly refer to items that require judgment by supervisors with certain experience, mainly the prediction of various direct fire risk sources. In the early stage when staff are not sufficiently skilled and professional, not too many requirements can be made for them, and they can be gradually increased as proficiency and awareness improve. Moreover, for some fixed contents of the building, the principle of the original design and completion status should be followed. Even if there is a gap between the original status and the specification requirements, it should be marked or explicitly ignored in the first formulation of the internal inspection plan. In daily inspections, only changes and new problems that may arise after changes are timely raised and judged whether they are compliant and need to be corrected. In this way, among the previously seemingly complicated items that required experience-based judgment, only many small items that can be judged as qualified or not

through surface observation are retained. This not only facilitates the participation of the majority of cadres, employees, and customers, but also ensures safety because flexible items actually have special technical services every year. It well solves the previous contradiction between the need for comprehensiveness and the need to enlighten full participation, and greatly improves management efficiency and effectiveness.

For example, regarding fire compartments, previous inspection methods and requirements generally involved checking the area of fire compartments, safety exits, and other elements. While these were comprehensive, frontline implementers might not fully understand or implement them. The newly proposed "full inspection and supervision method" breaks down the macro content of previous daily inspections into several intuitively observable and assessable items, establishing an inspection mechanism involving employees at all levels to replace the previous situation where only cadres and employees of the security system in each unit had the right and obligation to conduct inspections. For instance, fire compartment issues are analyzed to be implemented through specific elements such as floor slabs, walls, doors, rolling shutters, corner window spacing, hole sealing, and fire dampers, which constitute the entire structure of a fire compartment. Therefore, when creating the checklist for the first time, we first confirm the establishment and compliance of the current fire compartment through permit documents and on-site investigation, no longer dwelling on issues like area and other macro issues, but instead breaking down the walls into several small items that can be easily observed by frontline personnel on site. Generally, each wall between pillars is considered as one small item, and each floor slab and floor within the grid of beams or pillars are each considered as one small item. When it comes to walls, floor slabs, or floors, if there are holes during the first inspection, a corresponding small item should be separately listed. Additionally, each door, window, rolling shutter, fire damper, shaft penetrating floor slab, and cable tray penetrating wall are each listed as one or multiple small items. In this way, even ordinary salespersons, cleaning staff, office workers, and other staff can, according to the checklist requirements, clearly see a specific item and check if its current state has changed from the initial state or the state of the previous cycle. For example, if a wall has been opened due to construction or damaged for other reasons, a door is broken, or a sealed hole has been opened, they can promptly report it, leading second-level or higher-level inspectors to recheck, judge, and correct the issue in a timely manner. The "full inspection and supervision method" is an epoch-making innovation, as it greatly mobilizes the enthusiasm of all grass-roots employees to participate in and supervise the daily fire management of the unit, while appropriately and truthfully informing and empowering relevant employees with responsibilities. It proactively prevents cases such as the fire at a hotel in Harbin, where a waiter failed to close the corridor fire door, leading to the fire not being controlled in time and the waiter being convicted. It not only improves unit management but also prevents employee dereliction of duty in advance. It also has a good proactive supervisory effect on cases such as a residential building fire in a certain city, where the competent authority ultimately analyzed that residents and property management had a high rate of neglect in managing fire doors in stairwells and anterooms, as well as neglect in managing combustibles and evacuation indicators in corridors. When well-implemented, it can avoid similar fire cases and dereliction of management responsibilities. For another example, regarding the inspection of alarm systems, sprinkler systems, and other systems, in the past, only professional institutions tested their functions and appearance [2] , but in the future, such breakdown operations will be gradually applied to all, ultimately achieving the effect of full employee participation in supervision and implementation.

3.2 The inevitable requirement for comprehensively upgrading decomposition and implementation is to promote supervision in a hierarchical and递减 manner

After establishing a comprehensive table-based inspection mechanism, the number of sub-items will become very large for ease of operation, so further decomposition is necessary. Generally, all inspection items are subdivided into three to five levels, with each final sub-item focusing on a specific matter that can be observed and judged through surface phenomena, making it convenient for personnel at all levels, positions, and educational backgrounds to perform operations with simple training or even without training. Fewer than three levels are not conducive to supervision, while more than five levels are somewhat overly cumbersome; however, they can be extended up or down or merged under special circumstances and within specific scopes.

Typically, the first level consists of various employees who work at the site for a long time. The inspection cycle varies depending on specific circumstances: some items require daily inspection and constant observation, with abnormal findings reported promptly, while others can be inspected weekly or monthly. The second level is the supervisory spot check by middle management, with a cycle that can be monthly, quarterly, or other appropriate intervals, covering 5-30% of all items. It is best to appropriately rotate the spot check scope quarterly to avoid repeatedly checking the same area and ensure full coverage of all sub-items within a certain larger cycle. The third level is senior management, with a cycle of half a year or a year, but they can also conduct random spot checks

daily. The proportion should be based on the principles of seeking truth from facts and matching workload, reaching 1% or 0.3-0.5‰. Due to the high density of sub-items, this inspection workload is actually sufficient for senior managers to cover the entire unit, with the focus on urging middle and grassroots levels to implement. In our years of work practice and external exchanges, we have found that similar methods are mentioned by Japanese [5], Mr. Xiao, a senior expert from Singapore, when he came to Beijing to introduce practices, and in the final evaluation and supervision methods of some foreign insurance work [6]. This method is the best guidance, supervision, and implementation for grassroots implementers, ultimately piecing together the complex fire protection work into a well-structured puzzle and exerting the real and effective role of fire safety protection. In the future, China's fire supervision will likely make greater use of big data collection and supervision, as well as a "bumper" role to guide units to proactively upgrade protections. However, up to now, there is no universal and recognized method suitable for evaluating the quality of various units, and this method, with its full coverage, has made early attempts and laid the groundwork for these trends.

3.3 The core of the comprehensive inspection method lies in professional development and continuous iterative improvement

Based on the above method, the initial comprehensive sorting and presentation work of fire management will involve a large workload and certain technical requirements, requiring professional and technical personnel or even teams to complete, along with great patience and a certain period of time. The advantage is that once all inspection items are sorted out, and with appropriate mobilization, training, and trial implementation, all employees can be gradually mobilized to participate in fire safety work. During our travels and inspections in some developed countries, we observed and verified the management of local shopping malls, airports, hotels, restaurants, office buildings, and blocks, and visited some management units. The impressions and feedback obtained were basically that through similar methods, responsibilities are gradually decomposed and implemented at all levels, ensuring that the fire-fighting building structures and facilities from the early architectural design and construction stages are well-operated in daily operations, thereby ensuring building safety.

In China, some people may worry that since all sectors of cadres and the masses have been distant from the implementation points of fire safety work for many years, forming an established state or impression, it is difficult to integrate. However, with the rise of electronic evidence [5], identification technology, and AI technology such as modern electronic photography, videography, and image-text comparison technology, this model can actually significantly reduce the workload and error tolerance rate. This makes the full inspection method we propose and advocate for promotion come at the right time and be appropriately applied. In our previous work and research, we also found that many high-tech units, although the majority of employees have high scientific literacy, dare not participate in fire safety work, ultimately leading to fires [6]. Additionally, some units, after years of passive management guided by competent authorities, have gradually realized that only by managing well themselves can they avoid frequent issues during supervision, truly promote safety, and also comprehensively enhance the overall administrative management of the enterprise with orders being followed and prohibitions heeded, and work efficiency [7] by inspiring full participation. In our practice and promotion, we have personally felt that once the basic phenomena and theories are communicated with cadres and the masses, everyone's enthusiasm is greatly released and extremely high. Furthermore, with the gradual maturity of technical service institutions, the growth of professional practitioners, and the maturity of this method in practice, this model will develop rapidly, promote recognition and role-playing by units in various fields, provide a soaring wing for safeguarding social safety, and comprehensively improve the level and effectiveness of fire safety management in various social fields. However, it should also be accepted that the full inspection mechanisms and content of various systems and units will not be fully covered or suitable at once. Instead, after the initial establishment, they will be continuously improved and adjusted through constant practice and iteration, ultimately forming a fully effective and organically operating full inspection mechanism and content

4. CONCLUSION

Social fire safety management is complex and intricate, and relying solely on supervision departments and unit security departments to promote implementation is a case of insufficient capacity for heavy responsibilities, like a mantis trying to push a cart, leading to being stretched thin. Only by mobilizing the masses can it be better accomplished. However, mobilizing the masses requires reasonably manifesting and avoiding repeated changes under different conditions. Therefore, by reasonably sorting out each inspection item and conducting inspections layer by layer, efficient and comprehensive results can be achieved. Since relevant units and regions adopted the new "full inspection method" model for fire protection, the overall outlook and effectiveness of relevant units have

undergone tremendous changes, which is indeed worthy of understanding and learning by more units. Due to limitations in time, space, and expression ability, the corresponding details, statuses, and models have not been fully clarified, and some methods are still being continuously explored and updated. It is hoped that through the window of this journal, it can be introduced to all sectors of society for joint exchange, discussion, and common improvement

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Author Profile

Shan Jin (1971-), male, Manchu, Beijing, master's degree, senior engineer, research direction: social fire management, fire technical services.