Characteristics and Strategies for Radio and Television Technical Maintenance in the New Media Era: Postprint

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Abstract

As society progresses, people's ideological and cultural development has advanced significantly, and cultural life has been greatly enriched. Radio and television broadcasting exerts a profound influence on people's cultural life. This paper analyzes the current development status of maintenance technologies within China's radio and television broadcasting technology in the new media era, summarizes the characteristics of these maintenance technologies, and proposes strategies for enhancing the level of radio and television equipment maintenance work, aiming to provide valuable reference for relevant practitioners.

Full Text

Abstract

With societal progress, people's cultural and intellectual lives have developed significantly, with broadcast television exerting substantial influence on cultural enrichment. This paper analyzes the current state of broadcast television maintenance technology development in China within the new media era, summarizes the characteristics of maintenance technologies, and proposes strategies for improving equipment maintenance standards to provide reference for relevant practitioners.

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1. Current State of Broadcast Television Maintenance Technology Development in China

Although technology is rapidly advancing toward greater sophistication, not all cutting-edge technologies have been mastered. Some technologies have reached international advanced levels, while others remain at their current stage, representing a significant gap with global standards. For instance, international mainstream terminal decoder chip technology has achieved 2GHz primary frequency, while China's relevant technologies still lag behind this benchmark. However, China's production integration technology is undeniably world-class. Currently, China's broadcast television industry has imported advanced monitoring technologies from abroad that require further digestion and absorption. Meanwhile, corresponding supervision and management technologies are in their infancy and require continuous revitalization. As the information age evolves, people's lives are becoming increasingly enriched, and their cultural needs are transforming. Broadcast television has made indelible contributions to meeting these growing spiritual demands, becoming a popular form of mass entertainment in the new era.

2. Technical Characteristics of Broadcast Television Systems

2.1 Technical Intensity of Broadcast Television System Equipment

Traditional broadcast television technology operated at relatively low technical levels, utilizing simple control equipment for audio playback with isolated rooms and a singular operational management model. As domestic modernization has progressed, these outdated technologies have become increasingly inadequate for societal development and unable to satisfy people's growing spiritual and cultural needs. To adapt to the new era, technicians have upgraded the original broadcast control systems. Unlike traditional systems where each unit operated independently, new broadcast control systems are closely integrated with the master control room. In terms of content delivery, these advanced systems enable both single audio playback and video content broadcasting with seamless switching between modes. Equipped with synchronous motors and audio-video format conversion capabilities, these systems further integrate and optimize broadcast control resources and content allocation, enabling the delivery of superior large-scale events for society.

2.2 Introduction of Solid-State Transmission Systems

Broadcast television signal coverage comprises three integrated components: signal transmission, frequency modulation, and shortwave. Due to limitations in signal transmission technology, traditional coverage systems suffered from high energy consumption, heavy workloads, and vulnerability to equipment damage, requiring maintenance departments to prioritize system preservation and repair. Under the evolving new media landscape, broadcast television can now employ

advanced solid-state equipment during broadcast control processes. These technologies offer advantages including low energy consumption, reduced maintenance requirements, space savings, and more secure and reliable operation. The adoption of new equipment and technologies has further advanced domestic broadcast television control capabilities.

2.3 Development Status of Digital Programming

The number of broadcast television channels continues to grow, with transmission frequencies increasing accordingly. Currently, dozens of channels in China provide digital television content broadcasting, with daily transmission times reaching approximately eight hours. Some domestic television stations have even achieved 24-hour uninterrupted digital program broadcasting. The rapid development of digital broadcast control technology has further promoted the advancement of China's broadcast television industry.

3. Management Strategies for Broadcast Television Technology

To further adapt to the new media era, broadcast television technology management must be strengthened across four primary dimensions. The industry's development trend involves transitioning from traditional analog signals to advanced digital signals, with television content moving toward high-definition television and digital video broadcasting, and radio content transitioning to digital broadcasting. During this transformation, analog signal equipment must be digitally upgraded and replaced. Simultaneously, the adoption of new technologies such as information transmission and digital compression has substantially increased channel transmission capacity. The application of these new broadcast television technologies has effectively improved broadcast quality.

3.1 Mastering Equipment Operating Principles and Fault Localization

When broadcast television equipment malfunctions, maintenance personnel must locate faults and identify causes based on operational principles. To effectively repair fully solid-state broadcast television equipment equipped with numerous integrated circuits, maintenance staff must thoroughly understand equipment operating principles and master corresponding maintenance techniques, supplemented with appropriate detection instruments for timely and effective fault resolution.

3.2 Reducing Equipment Failures and Minimizing Major Equipment Malfunctions

Broadcast television equipment maintenance personnel must possess high-level technical expertise, conducting regular maintenance and irregular inspection tours to detect and resolve equipment faults promptly while reporting to relevant management departments. This approach eliminates safety hazards in

equipment operation, particularly through rigorous inspection of large-scale broadcast television equipment to ensure safe and stable system operation.

3.3 Documenting Normal Operating States and Fault Phenomena

Effective equipment maintenance requires personnel to preserve factory acceptance reports for reference during inspection and maintenance. Each equipment failure phenomenon and troubleshooting process must be documented to provide effective support for subsequent fault localization. When failures occur, maintenance personnel should rapidly locate faults and identify causes, referencing maintenance records for appropriate repairs. Detailed records of each fault resolution process should be maintained for future reference when similar situations arise, enabling targeted maintenance. By combining theoretical knowledge with practical application, staff can identify root causes of failures and eliminate safety hazards at their source.

3.4 Maintaining Maintenance Records and Summarizing Lessons Learned

Beyond possessing essential maintenance technical skills, broadcast television equipment maintenance personnel must thoroughly master equipment operating principles and maintain detailed records of each maintenance process. This enables rapid fault localization and timely resolution. In daily maintenance work, personnel should actively engage in continuous learning to improve their technical capabilities and conduct in-depth exchanges with colleagues regarding equipment maintenance issues. By summarizing experiences and lessons learned, they can prevent equipment failures to the greatest extent possible, ensuring safe and stable equipment operation and contributing to the sustainable development of the broadcast television industry.

3.5 Management Optimization Measures

Conceptual Transformation: Break free from outdated traditional mindsets by actively introducing and digesting advanced foreign technologies to achieve technological breakthroughs.

Personnel Reallocation: In broadcast television technology management, clearly define respective functions and responsibilities, establish practitioners' accountability consciousness, and actively reform personnel systems to improve comprehensive staff quality and optimize human resources.

Technology Market Standardization: During broadcast television technology management, standardize the technology market according to relevant laws and regulations. Actively introduce and absorb advanced technologies and equipment to accelerate broadcast television industry development, expand business coverage areas, and attract greater social capital investment.

3.6 Technical Capability Innovation in Management and Operation Systems

The further application of digital and network technologies in broadcast television has presented new challenges for equipment maintenance personnel. To ensure stable broadcast system operation, relevant maintenance staff must collaborate closely to strengthen system mastery and achieve comprehensive understanding of the entire broadcast system's operational status. Concurrently, maintenance management must optimize power supply systems by equipping broadcast television equipment with dual-circuit power supply and developing emergency response measures for various contingencies to ensure sufficient system carrying capacity.

Conclusion

In summary, the further development of the new media era and improvement of social economic levels have positively promoted China's broadcast television technology research and development process, representing a new technological transformation. Broadcast television technology maintenance must adapt to new requirements of the new media era. Relevant personnel should actively innovate maintenance technologies while improving their technical capabilities, and formulate and improve relevant maintenance standards and manuals. This provides effective guarantees for safe and stable broadcast television equipment operation, thereby strongly supporting the sustainable development of the broadcast television industry.

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Note: Figure translations are in progress. See original paper for figures.