

# Fire Crisis Management in Prisons

Case Study: Honduras Prisons 2012

Faisal Mutlaq Alosaimi And Daniyal Mohammed Alghazzawi

Department Faculty of Earth Sciences,  
King Abdulaziz University, P.O. Box 80204, Jeddah 21589,  
Saudi Arabia.

**Abstract—** Abstract This study aims to assess the effectiveness of fire crisis management in prisons by analyzing lessons learned from fire incidents in Honduras prisons and surveying experts in crisis and disaster management as well as prison administration. The study adopted a descriptive-analytical methodology and was conducted on a sample of 140 specialists in crisis and disaster management and prison administration. Field data analysis and a review of previous literature were utilized to identify influencing factors such as system quality, training, infrastructure, and challenges facing fire management. The findings revealed the significance of safety, effective management, and lessons learned (94%), the quality of procedures and protocols (95%), and the strong correlation between system efficiency, training, and infrastructure with the effectiveness of prison fire crisis management (95%). Training and qualification received the highest importance (96%), while inmate training ranked the lowest (87%). The results also emphasized the urgent need to upgrade infrastructure, enhance early warning systems, reduce overcrowding, and improve coordination among relevant authorities. The study recommended establishing a national database to document prison incidents, developing clear guidelines, prioritizing inmate training, strengthening training programs, modernizing firefighting systems, and utilizing modern technology in crisis response. These measures contribute to improving crisis management and minimizing human and material losses in prisons. Finally, the study presented a proposed program for crisis management in prisons.

**Keywords—**Prison Fire Safety; Crisis Management; Disaster Management; Emergency Evacuation ;Lessons Learned.

## I. INTRODUCTION

Crises are a global phenomenon associated with the economy, politics, and natural and industrial phenomena, requiring preventive measures and procedures to deal with them before, during, and after their occurrence. In our current era, characterized by technological development and openness between countries—often referred to as the age of crises—these challenges manifest in economic, social, and educational aspects of life. Consequently, many universities and educational institutions have incorporated specialized programs in crisis management to cover humanitarian, security, and economic fields. It has become essential to develop school administrations to include advanced managerial methods that enable them to deal with crises effectively.

A horrific fire broke out in a Honduras prison (Comayagua), killing hundreds amid conflicting reports regarding the exact number of victims, with official reports indicating between 270 and 357 inmate fatalities. Authorities stated that the fire erupted during a riot, leading to dozens of injuries and the

escape of some prisoners, while the definitive causes remained unconfirmed, despite suspicion of an electrical short circuit. Firefighting teams confirmed they controlled the blaze, and authorities launched an investigation into the incident amid distress from the victims' families. [1]

This research aims to assess the effectiveness of fire crisis management in prisons through a comprehensive analytical and field study. It analyzes the status of existing systems and the challenges they face in prisons by examining the case study of the Honduras prison, alongside deriving lessons learned from the experiences of Arab and international countries in the field of prisons. This is achieved by gathering the opinions of specialists in prison and crisis management, as well as students specializing in prison-related crises and disasters.

The focus on the Honduras prison is due to recurring incidents warranting study. The most recent of these was the death of at least 41 female inmates in a women's prison in Honduras, following a clash between rival gangs that led to a fire engulfing part of the facility near the capital. Authorities are still working to identify the victims, most of whom died due to the fire. The country's president, Castro, described the incident as "the monstrous murder of women," affirming her determination to take strict measures to confront gang violence in the country. [1]

Considering that prison facilities are designed to hold approximately 8,000 inmates but house over 12,000, the deplorable conditions within these institutions have become symbolic of broader societal challenges, including high crime rates and a punitive governance approach under different administrations [2].

To derive lessons and insights from fire incidents in global prisons, specifically the Honduras prison, it is necessary to examine similar incidents in other environments from which lessons can be learned. Therefore, a range of crises in different settings is presented to prepare for leveraging lessons from other prison disasters and crises. This necessitates identifying the research gap for countries benefiting from these experiences and events.

Prison fires are extremely challenging and have catastrophic outcomes because they are very difficult to extinguish due to numerous negative factors such as location conditions, the nature of the individuals being rescued, and the prison environment. Many prison buildings contain abundant flammable materials and are poorly equipped with automatic fire alarm and automatic fire suppression systems. Simultaneously, their fire resistance rating is low. All this can lead to rapid fire spread once something ignites, while the resulting smoke reduces visibility, making emergency

evacuation difficult, and high temperatures facilitate mass casualties or fatalities [3].

Prison fire crisis management encompasses the strategies and protocols designed to prevent, respond to, and recover from fire incidents within correctional facilities. Given the unique and often hazardous environment of prisons, effective fire crisis management is crucial to ensuring the safety of both inmates and staff. Historical events, such as the disastrous 1930 Ohio State Penitentiary fire, which claimed the lives of 320 inmates, underscore the urgent need for robust fire safety measures and crisis management protocols in these institutions [4].

Despite advancements in technology and fire safety regulations—which have led to an 88% decrease in prison fires since 1980—challenges persist. Fires continue to occur, often caused by inmates or arising from negligence in safety protocols, with a significant proportion being incendiary in nature [5].

The main components of fire crisis management include proactive planning, staff training, resource coordination, and continuous improvement through post-incident assessments [6].

Fires often originate from common areas like kitchens or prisoner cells, and a significant portion are intentionally set by inmates. Despite these troubling trends, advancements in technology and stricter fire codes have contributed to a notable decline in prison fires, with incidents decreasing by 88% since 1980 [7].

#### A. Overview of Fire Safety in Correctional Institutions

Fire safety regulations in correctional institutions are crucial for preventing and mitigating fire incidents, which pose significant risks due to the unique environment and population within these facilities. According to the National Fire Protection Association (NFPA), 85 percent of fires in penal institutions are incendiary, often starting with smoking materials like matches and lighters [8].

#### B. Regulatory Compliance and Maintenance

The maintenance and testing of fire protection systems—such as sprinklers, smoke detectors, and fire alarms—are subject to specific NFPA codes, including NFPA 25 for sprinkler systems and NFPA 72 for fire alarm systems. Regular inspections are crucial to ensure these systems function coherently, with special inspections for smoke control systems adding an additional layer of oversight. Adherence to these regulations not only enhances the safety of correctional facilities but also mitigates liability and risks associated with potential fire incidents [9].

The crises in Honduras prisons reflect deep structural challenges requiring comprehensive reforms at legislative, administrative, and societal levels. By learning from these crises, other countries can avoid their repetition by implementing strict safety protocols, combating corruption, and generally improving prison conditions.

## II. STUDY VARIABLES

### A. Independent Variables

Factors influencing fire crisis management in prisons. These are the factors and variables affecting the effectiveness of fire crisis management in prisons.

- Quality of Fire Crisis Management Systems: (Current procedures, protocols, and their quality).
- Lessons Learned from the Honduras Prison Experience.

### B. Dependent Variable

Effectiveness of Prison Fire Crisis Management. This can be measured according to the following indicators:

- Effectiveness of Response and Evacuation: (Speed of response to fire, success of evacuation and inmate rescue operations, reduction of human and material losses).
- Level of Preparedness: (Extent of prison readiness to deal with fire crises, assessment of coordination level between relevant authorities during crises).
- Inmate and Staff Satisfaction: Level of satisfaction with safety procedures and crisis management.
- Confidence in management's ability to handle emergencies.
- Improvement of policies, procedures, and protocols to ensure all aspects of preparedness and response are achieved..

## III. DATA COLLECTION AND ANALYSIS

The study relied on a questionnaire for measurement. The researcher used a response scale consisting of (3) ranking degrees and employed arithmetic means to represent data and determine scores.

The estimates according to the three-point Likert scale can be clarified as follows:

- Very High: From 80% to 100% (3.00 - 2.6)
- High: From 60% to 79.9% (2.59 - 2.20)
- Medium: From 40% to 59.9% (2.19 - 1.80)
- Low: From 20% to 39.9% (1.79 - 1.40)
- Very Low: From 0% to 19.9% (1.39 - 1.00).

For the first question regarding the dimensions of firefighting procedures, the Saudi prisons employees answers are shown in Fig. 1.

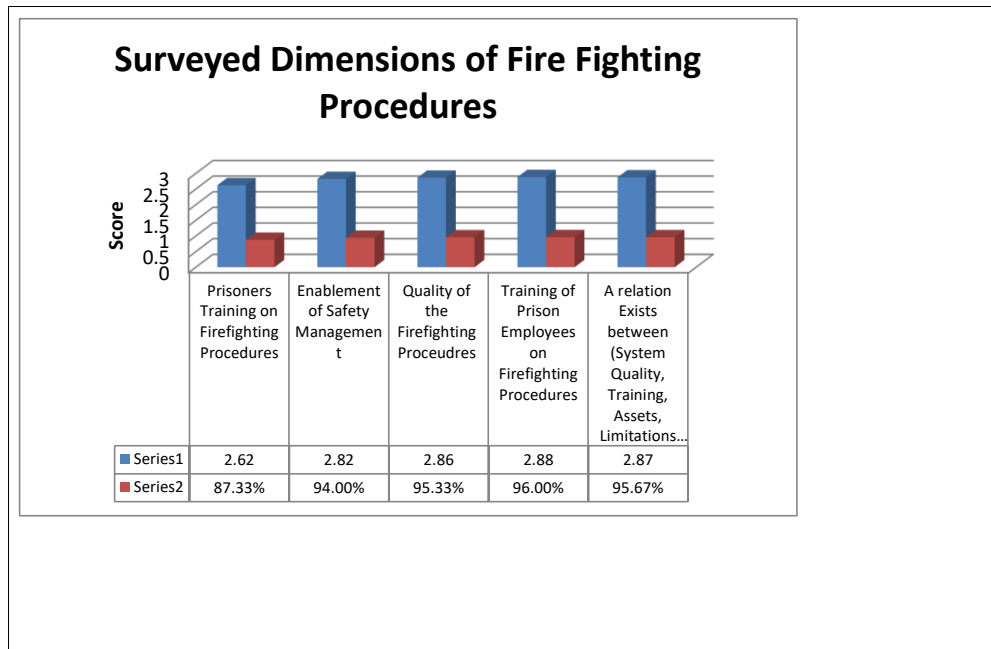


Fig. 1. The Dimensions of firefighting Procedures

The researcher's opinion regarding the results of the five items is that they provide experiences for other environments to focus on the following:

1. Importance of improving initial training: Develop the content of initial training to include more practical aspects, such as fire simulation drills, and provide interactive educational tools to increase training effectiveness.
2. Enhancing periodic drills: Increase the frequency of periodic drills and diversify their methods to ensure continuous learning, involving local firefighting teams in delivering these drills.
3. Strengthening post-release rehabilitation programs: Provide intensive rehabilitation programs focusing on safety skills in public life, and cooperate with community entities to ensure training continuity after release.
4. Improving periodic assessments: Develop comprehensive assessment tests covering theoretical and practical aspects, and use assessment results to identify weaknesses and work on improving them.
5. Enhancing continuous awareness: Organize periodic awareness campaigns inside prisons to remind prisoners of preventive procedures, and use diverse media (such as posters and videos) to increase awareness effectiveness.

Therefore, the results indicate that training and awareness programs exist but need ensured continuity to increase their effectiveness. Future efforts should focus on developing training content, increasing its frequency, and ensuring the continuity of awareness and periodic assessments to achieve optimal safety inside and outside prisons. See fig. 2.

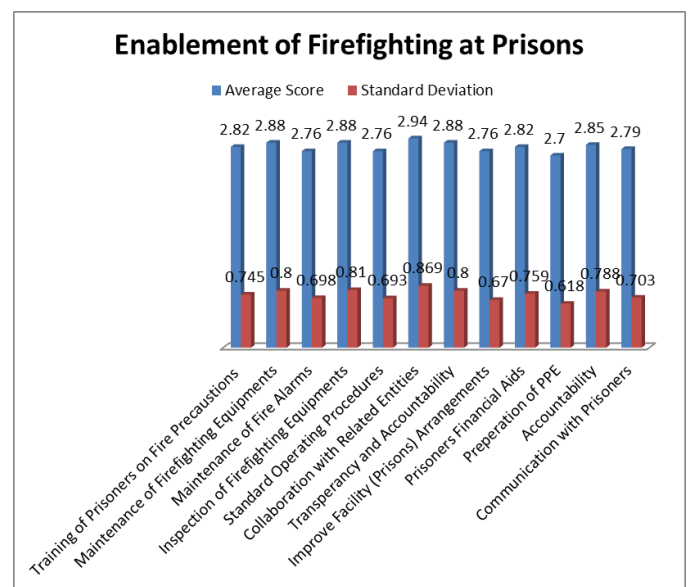


Fig. 2. Enablement of Firefighting at Prisons

As seen in Fig. 3, It is evident that there are some procedures with high efficiency, while other items show shortcomings that need improvements, which are very few, as most items received a very high rating. Overall, the general relative weight (95%) and the general arithmetic mean (2.86) indicate that the quality of procedures is very high, ideal, and requires continued attention to some aspects, especially since we are discussing fires and the safety of inmates from them, which can cause disasters. The standard deviation shows variation in the opinions of specialists, which may indicate differing viewpoints based on personal experiences and different contexts.

These results indicate that the quality of procedures applied in managing fire crises within prisons is not uniform, as there are effective aspects and others that need improvements. The focus should be on enhancing procedures with high ratings while simultaneously developing and improving procedures that received lower ratings, even though all were rated very highly. Here, the researcher recommends conducting periodic reviews of these protocols and involving experts in their improvement to make them more efficient and suitable for various conditions.

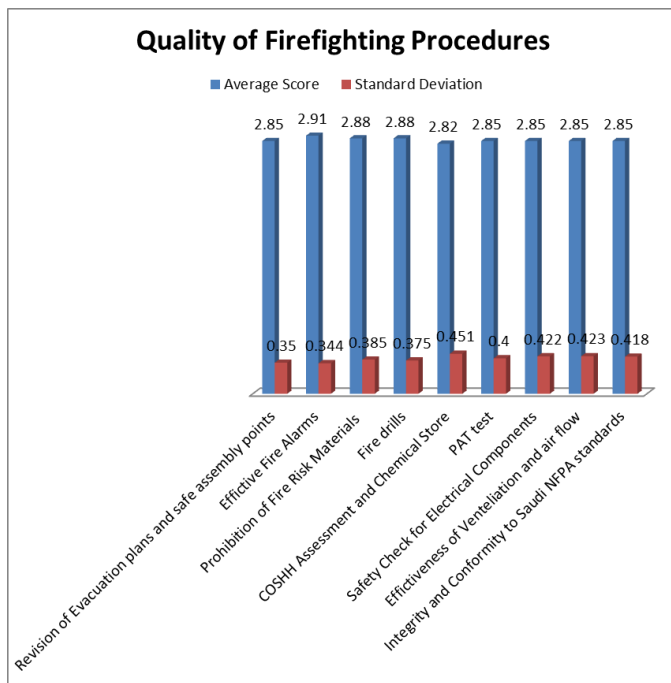


Fig. 3. Quality of firefighting Procedures

Answering the Fourth Question: "What is the level of training and qualification required for prison administration staff on security and safety procedures for inmates from the viewpoint of specialists in crises, disasters, and prison management, based on lessons learned from the Honduras prison?"

To answer the previous question, the following hypothesis was formulated: "The training and qualification of prison administration staff on security and safety procedures for inmates are insufficient and negatively impact their ability to deal with fire crises, according to the opinions of specialists and lessons learned from the Honduras prison."

According to the results of the survey results as shown in Fig. 4;

1. The researcher believes that the results reflect the importance of staff participation in improving safety procedures, as motivating them to provide feedback can enhance a safety culture.
2. The researcher emphasizes the importance of practical training (such as emergency incident simulations) to increase staff preparedness for dealing with crises.

3. The researcher indicates that continuous updating of training based on previous incidents and developments is key to the success of crisis management.

4. The researcher draws attention to the fact that current training programs are sufficient, but this does not negate the necessity of increasing attention to continuous training.

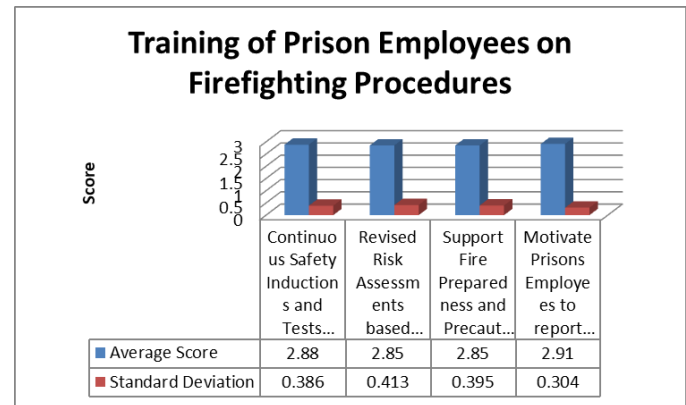


Fig. 4. Training of Prison Employees on Firefighting Procedures

The results reflect that the current level of training and qualification for prison staff needs to be maintained, and that staff participation and practical training are critical factors for achieving greater effectiveness. The researcher attributes these results to the availability of resources, enhanced attention to training, and the existence of a strong safety culture, and recommends maintaining these aspects to enhance crisis management.

Answering the Fifth Question: "Is there a statistically significant relationship between the influencing factors (quality of systems, training, infrastructure, challenges, lessons learned) and the effectiveness of prison fire crisis management from the viewpoint of specialists in crises, disasters, and prison management?"

To answer the previous question, the following hypothesis was formulated: "There is a statistically significant relationship between the influencing factors (quality of systems, training, infrastructure, challenges, lessons learned) and the effectiveness of prison fire crisis management."

Based on Fig. 5; the Researcher's Opinion is that the results make it clear that the highest priority for improving fire crisis management inside prisons is given to factors related to the quality of security systems and early warning, in addition to updating infrastructure to ensure rapid response and risk reduction. However, factors related to training and benefiting from lessons learned require continued attention, indicating the necessity of enhancing these aspects to ensure the sustainability of preventive and managerial efforts.

Based on this, the researcher recommends the following based on the results of this dimension:

1. Updating security systems and early warning systems: This is the most influential factor in crisis management, thus efforts should be made to develop integrated digital systems capable of alerting specialized teams immediately upon any emergency.



2. Improving infrastructure for firefighting, ventilation, and exit systems: Necessity to improve facilities to ensure rapid evacuation, equipping prisons with more advanced automatic firefighting systems.
3. Enhancing staff training programs: Despite the importance of training, it is more effective in improving practical response to crises.
4. Analyzing lessons learned from previous incidents more effectively: Necessity to document and analyze each previous incident systematically, to ensure the practical application of derived recommendations within prisons in the future.
5. Re-evaluating the logistical challenges and structural design of prisons: Attention must be paid to more efficient architectural planning that allows easy access to all areas, contributing to faster evacuation and emergency response.
6. Reducing prison overcrowding: Results indicate that overcrowding may hinder crisis management, necessitating regulatory policies to control inmate numbers according to available facility capacities, which is why items related to this aspect received very high ratings.

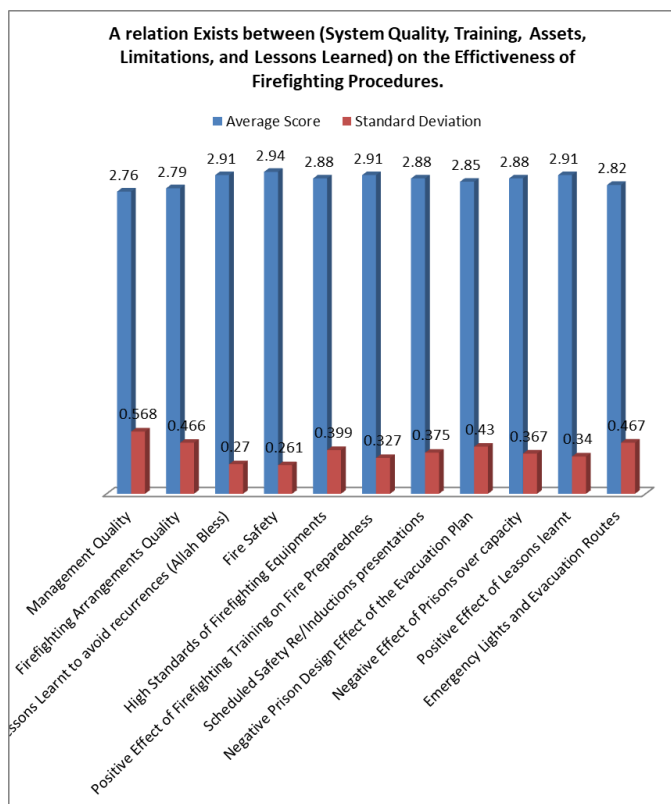


Fig. 5. Example of a figure caption. (figure caption)

#### IV. CONCLUSIONS AND RECOMMENDATIONS

After the text edit has been completed, the paper is ready for the template. Duplicate the template file by using the Save As command, and use the naming convention prescribed by your conference for the name of your paper. In this newly created file, highlight all of the contents and import your prepared text file. You are now ready to style your paper; use the scroll down window on the left of the MS Word Formatting toolbar.

#### A.

#### Conclusion

The results indicate that the success of fire crisis management in prisons fundamentally depends on a combination of technical factors, such as security systems and early warning, and administrative factors like training and benefiting from lessons learned. However, there is a need to improve the integration between all these factors to ensure a more efficient response to crises and reduce risks threatening the lives of both inmates and staff.

Based on the results;

- The opinions of the respondents highlighted the importance of lessons learned and enhancing safety and effective management, obtaining a relative weight (94%), confirming their importance in developing effective crisis management strategies.
- The result for training prisoners before, during, and after sentencing was very high, although it ranked last, with a relative weight of (87%), confirming the existence of attention to inmate rehabilitation and training, and the importance of this aspect in maintaining public safety.
- The quality of procedures and protocols came in second place with a relative weight (95%), reflecting the importance of having clear systems for managing fire crises.
- The influencing factors and their effectiveness: Results confirmed with a relative weight (95%) the strong relationship between the quality of systems, training, and infrastructure in improving prisons' response to crises.
- Results showed that training ranks first with a relative weight (96%), indicating the importance of training in the effectiveness of prison fire crisis management, hence the significant attention given to this aspect.
- Results revealed that outdated infrastructure hinders rapid fire response, necessitating the enhancement and updating of infrastructure.
- Results showed that the absence of advanced alarm systems leads to delayed response and increased losses, hence the very significant attention given to alarm systems.
- Overcrowding is a main factor increasing the difficulty of crisis management, hence the respondents' opinions tended to give this factor a very high rating.
- There was very significant attention given to implementing strict inspection mechanisms to avoid the probability of fires breaking out inside prisons.
- The importance of legislative reforms came in a very high rank, indicating the need to review laws related to crisis management and maintain their existence, dissemination, and generalization.
- Results showed the need for integrated fire response plans inside prisons, and their great importance in achieving the effectiveness of prison fire crisis management.
- There is a high use of modern technologies in crisis management, indicating their effective role in improving response.
- Very significant attention from the specialists' viewpoint regarding the necessary personal protective equipment to achieve security and safety procedures for inmates.

## B. Recommendations

This paper recommends the following:

- a) Enhance learning from past crises by establishing a national database to document and analyze fire incidents in prisons.
- b) Improve the quality of procedures and protocols by developing clear guides for fire management.
- c) Develop intensive training programs targeting all prison staff to ensure their effective response to crises.
- d) Enhance the infrastructure for firefighting systems by updating facilities and installing modern fire detection systems.
- e) Reduce prison overcrowding through regulatory and administrative reforms to alleviate pressure within penal institutions.
- f) Enhance coordination between relevant authorities by establishing joint operations rooms for crisis management.
- g) Utilize modern technology such as artificial intelligence systems to monitor fires and respond more quickly.

## ACKNOWLEDGMENT

Work presented in this paper is extracted from a master's thesis prepared by Faisal Mutlaq Alosaimi under the supervision of Prof. Dr. Daniyal Mohammed Alghazzawi.

## REFERENCES

- [1] Rembecki, D. (2022). Gender-Based Violence in Honduras: International Involvement against Impunity.
- [2] Gagne, D. (2014). Is Honduras Faking its Falling Homicide Rates?. InSight Crime.
- [3] EDDA CHERUTO, N. G. E. I. Y. W. A. (2023). FIRE DISASTER PREPAREDNESS STRATEGIES INFLUENCING RESPONSE OPERATIONS OF PRISONS IN CENTRAL KENYA.
- [4] Roth, M. P. (2019). Fire in the Big House: America's Deadliest Prison Disaster. Ohio University Press.
- [5] Beety, V. E., & Oliva, J. D. (2018). Evidence on fire. NCL Rev., 97, 483.
- [6] Chen, A., Chen, N., & Li, J. (2012). During-incident process assessment in emergency management: Concept and strategy. Safety science, 50(1), 90-102.
- [7] Warr, J. (2021). Fire! Fire!—the prison cell and the thick sensuality of trappedness. In Sensory penalties: Exploring the senses in spaces of punishment and social control (pp. 19-33). Emerald Publishing Limited.
- [8] Petersen, J. A. (2019). National fire protection association standards in fire litigation. Engineering Standards for Forensic Application, 155-168.
- [9] Mia, M. M. (2025). A SYSTEMATIC REVIEW ON THE IMPACT OF NFPA-COMPLIANT FIRE PROTECTION SYSTEMS ON US INFRASTRUCTURE RESILIENCE. International Journal of Business and Economics Insights, 5(3), 324-352.