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Mitigating Workplace Accident Risks through Job Safety Analysis (JSA) in the Reconstruction of Post-Earthquake Buildings in Cianjur Regency

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Abstract. The reconstruction of buildings post-earthquake presents significant challenges, particularly in ensuring the safety of construction workers. This study focuses on the application of Job Safety Analysis (JSA) to mitigate workplace accident risks in the reconstruction of buildings in Cianjur Regency, Indonesia, following a major earthquake. By systematically identifying hazards and implementing control measures, JSA aims to improve safety outcomes and support successful project completion. This paper presents a comprehensive analysis of JSA methods, their application in the context of earthquake reconstruction, and their effectiveness in reducing workplace accidents.

Keywords: JSA, risk, mitigation

1. Introduction

The aftermath of natural disasters such as earthquakes often necessitates extensive rebuilding efforts. The reconstruction of damaged structures in areas like Cianjur Regency involves complex and hazardous activities. Ensuring worker safety during such projects is crucial to both the success of the reconstruction effort and the wellbeing of construction personnel. Job Safety Analysis (JSA) is a systematic approach used to identify potential hazards associated with specific job tasks and to develop strategies to mitigate these risks. This paper explores the application of JSA in the context of post-earthquake building reconstruction, aiming to enhance safety and operational efficiency. [1] [2]

2. Methods

2.1. *Risk Control with JSA (Job Safety Analysis) Method*

The Public Works Construction Occupational Safety and Health Management System (SMKK) is a structural management system for the implementation of construction work in the context of one of the Construction Safety risk controls on construction work in the field of Public Works. The SMKK function has the following objectives:

1) Effectivize occupational safety and health protection that is planned, measured, structured and integrated;
2) Prevent and reduce the number of work accidents and occupational diseases;
3) Creating a conducive, comfortable and safe work area, to increase productivity. [3] [4]

2.2. Application in Cianjur Regency

In the context of the Cianjur Regency reconstruction, the JSA process was applied to tasks such as debris removal, structural assessment, and rebuilding activities. This involved collaboration with construction teams, safety experts, and local authorities to ensure comprehensive hazard identification and risk mitigation.

3. Results

3.1. Hazard Identification

Key hazards identified included unstable structures, falling debris, and exposure to hazardous materials. For example, during debris removal, there was a risk of injury from falling objects and exposure to hazardous dust.

The analysis identified several high-risk areas, including:

- **Falls from Elevated Work Platforms:** Workers were at risk of falls from ladders, stairs, and elevated work platforms.
- **Musculoskeletal Injuries:** Excessive lifting, twisting, pushing, pulling, reaching, or bending were common causes of musculoskeletal injuries.
- **Exposure to Hazardous Materials:** Workers were exposed to hazardous materials such as wood dusts, excessive noise, and harmful levels of gases and vapors.

3.2. Control Measures

Control measures implemented included:

- **Engineering Controls**: Stabilization of structures before work began, use of protective barriers, and safety nets.
- **Administrative Controls**: Training programs for workers, safety briefings, and scheduled breaks to reduce fatigue.
- **Personal Protective Equipment (PPE)**: Provision of helmets, gloves, and respiratory protection.

3.3. Effectiveness

The application of JSA led to a noticeable reduction in workplace accidents. Data collected showed a significant decrease in reported incidents compared to previous projects where JSA was not utilized.

4. Discussion

The findings of this study highlight the importance of JSA in identifying and mitigating workplace hazards. By integrating JSA with existing safety protocols, we were able to reduce the risk of workplace accidents significantly. Technical controls such as installing safety signs and equipment, administrative controls such as briefing workers before tasks, and the use of Personal Protective Equipment (PPE) were found to be effective in minimizing these risks.

5. Conclusion

Job Safety Analysis (JSA) is a vital tool for mitigating risks in construction projects, especially in the challenging context of post-earthquake reconstruction. The successful application of JSA in Cianjur Regency highlights its effectiveness in enhancing worker safety and ensuring project success. Future

research should focus on refining JSA techniques and exploring their application in other disaster recovery scenarios. This study demonstrates the effectiveness of JSA in mitigating workplace accident risks during the reconstruction of post-earthquake buildings in Cianjur Regency. The structured approach to identifying and assessing hazards, coupled with the implementation of technical and administrative controls, ensures a safer working environment for construction workers. The findings of this study contribute to the body of knowledge on workplace safety in disaster reconstruction efforts, emphasizing the importance of JSA in ensuring a safer working environment.

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