Strategi Evakuasi Kebakaran Dengan Pemodelan Pathfinder 3D di Gedung Hotel Bandar Udara

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Abstrak

Hotel di kawasan bandara menghadapi risiko kebakaran yang tinggi akibat tingkat okupansi yang tinggi, aktivitas selama 24 jam, serta keberagaman karakteristik penghuninya. Proses evakuasi dalam situasi darurat kebakaran menjadi tantangan penting dalam memastikan keselamatan jiwa. Penelitian ini bertujuan merancang strategi evakuasi kebakaran berbasis perangkat lunak pada tiga hotel bandara di Indonesia: Hotel X (Yogyakarta International Airport), Hotel Y (Juanda International Airport), dan Hotel Z (I Gusti Ngurah Rai International Airport). Penelitian menggunakan pendekatan semi kuantitatif dengan pengumpulan data primer dan sekunder melalui observasi, wawancara, dan checklist sarana evakuasi. Simulasi evakuasi dilakukan menggunakan perangkat lunak Pathfinder dengan mempertimbangkan tata letak gedung dan karakteristik penghuni sebagaiman aslinya. Hasil penelitian menunjukkan bahwa ketiga hotel memiliki potensi bahaya kebakaran yang dominan berasal dari instalasi listrik dan aktivitas dapur. Meskipun secara teknis hasil vvaluasi sarana evakuasi telah sesuai terhadap standar dan peraturan, secara operasional masih diperlukan perbaikan, seperti memberikan short induction kepada tamu hotel saat melakukan check in. Selain itu, simulasi menggunakan Pathfinder memperlihatkan bahwa waktu evakuasi aktual mendekati batas aman Available Safe Egress Time (ASET). Diskusi menekankan pentingnya penggunaan material tahan api, sosialisasi berkala kepada penghuni, serta integrasi sistem teknologi evakuasi. Simulasi Pathfinder terbukti efektif dalam memvisualisasikan skenario evakuasi dan memberikan dasar perumusan strategi evakuasi kebakaran di hotel bandara. <hr /> Hotels in airport areas face a high risk of fire due to high occupancy rates, 24-hour activity, and the diverse characteristics of their guests. The evacuation process in fire emergencies is a major challenge in ensuring safety. This study aims to design a software-based fire evacuation strategy for three airport hotels in Indonesia: Hotel X (Yogyakarta International Airport), Hotel Y (Juanda International Airport), and Hotel Z (I Gusti Ngurah Rai International Airport). The study uses a semi-quantitative approach with primary and secondary data collection through observation, interviews, and evacuation facility checklists. Evacuation simulations were conducted using Pathfinder software, considering the building layout and occupant characteristics as they are in reality. The study results indicate that all three hotels have dominant fire hazards originating from electrical installations and kitchen activities. Although the technical evaluation of evacuation facilities meets standards and regulations, operational improvements are still needed, such as providing a brief orientation to hotel guests during check-in. Additionally, the Pathfinder simulation revealed that the actual evacuation time was close to the safe limit of Available Safe Egress Time (ASET). The discussion emphasized the importance of using fire-resistant materials, conducting regular awareness campaigns for occupants, and integrating evacuation technology systems. The Pathfinder simulation proved effective in visualizing evacuation scenarios and providing a basis for formulating fire evacuation strategies in airport hotels.