

6. SUMMARY

In this report, evacuation time difference between elevator use group and stairs use group was analyzed by using simplified evacuation models for elevator use and stairs use, based on the data from the investigation on evacuation behavior of the occupants in the real fire in Hiroshima Motomachi high-rise apartments. Although limited in a certain condition of elevator operation described in this report, the diverging point of the advantage of evacuation by elevator in terms of evacuation time to compare with evacuation by stairs appears roughly on 14th floor to 16th floor. In the future, the model improvement and further analysis is needed, considering variety of number of occupants, operating condition of elevators, and the index how to evaluate evacuation efficiency by elevators and/or by stairs.

7. ACKNOWLEDGEMENTS

The authors gratefully acknowledge the courtesy of Hiroshima City Fire Department and the collaboration of Ms. M. Nakano, Mr. K. Kubota, and Dr. Y. Ohmiya in making the data of the investigation on evacuation behavior in the Hiroshima Motomachi high-rise apartments fire.

REFERENCES

1. Sekizawa, A et al., "Occupants' Behavior in response to the High-rise Apartments Fire in Hiroshima City", Proceedings of the First International Symposium on Human Behaviour in Fire, pp.147-156, Belfast, Northern Ireland, 1998.
2. Omiya, Y, et al., "Trend of the Performance-Based Codes and Fire Safety Design Method", Journal of Japan Association for Fire Science and Engineering (KASAI), Vol.49 No.1, pp.22-27, February 1999.
3. Nakahama, S, et al., "Study on Availability of Evacuation by an Elevator in Consideration on the Aged People -- Example of the Hiroshima Motomachi High-rise Apartment Fire", Journal of Japan Association for Fire Science and Engineering (KASAI), Vol.48 No.3, pp.44-49, June 1998.

A Study for the Fire Safety Planning of the Himeji-jo Castle, A World Heritage

G. MIZUKAMI and Y. HASEMI

Waseda University

Okubo 3-4-1, Shinjuku-ku, Tokyo 169-8555, Japan

T. YAMADA

National Research Institute of Fire and Disaster

Nakahara 3-14-1, Mitaka-City, Tokyo 181-0005, Japan

T. JIN

Fire Protection Equipment & Safety Center of Japan

Toranomon 2-9-16, Minato-ku, Tokyo 105-0001, Japan

ABSTRACT

Himeji-jo castle, a National Treasure and UNESCO World Heritage, is visited by numerous sightseers every year. In order to derive a fire safety measures for the visitors' safety, 1/25 scale model experiments are carried out to grasp the smoke movement in the castle's main tower. The experiments demonstrate interesting effects of the architectural features of the castle to the smoke movement.

KEYWORDS: smoke movement, historical building, castle building, reduced scale experiment

1. INTRODUCTION

Himeji-jo Castle, a 400 years old National Treasure and UNESCO world heritage, is visited by numerous sightseers from all over the world, around one million a year, and maximum over 6000 daily visitors. There is a record that over 600 persons stood on the 110m² top floor, 5.4 person/m², at an extreme peak. For this reason, consideration of fire safety is important not only for the protection of the historic building itself but also for the life safety of visitors. The current fire safety measures in the castle building are based on the Fire Service Law with the primary purpose to protect cultural assets by, for example, sprinklers, indoor fireplugs and, fire extinguishers. However, it has not yet been verified whether these measures effectively function for the safety of visitors in the event of an actual fire. Under many