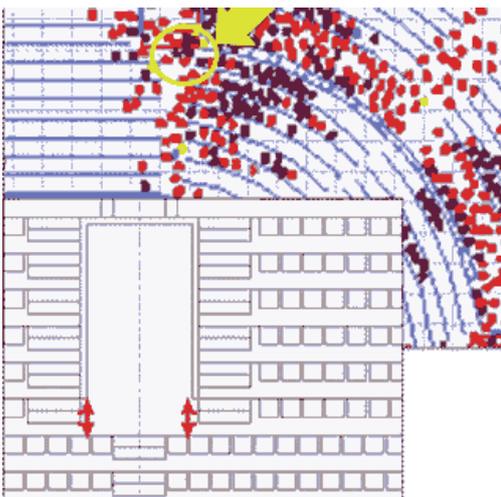


Sports Stadium. Simulation of Normal Operations and Evacuation.

Savannah Simulations conducted an evacuation and egress simulation study of the newly built “Sports Arena Lucerne”, now called “swissporarena,” in Switzerland with SimWalk PRO. The planned stadium with 16’000 seats was finished in winter 2010.

The goal of the simulation study was to evaluate the evacuation of the whole stadium, which, according to Swiss building and fire safety codes, should be accomplished within 8 minutes. The visitors and their behavior were modeled according to specific profiles for visitors of sport arenas.

Simulations showed that the stadium could be evacuated in approximately 8 minutes, depending on the different assumptions regarding the reaction time of the stadium visitors. In one scenario there was the assumption that all the occupants reacted on the hazard event at the same time which delayed the evacuation time due to larger bottlenecks. If the reaction time was tiered, the simulation indicated a decrease of evacuation time.



Different scenarios of evacuation management were simulated – for example with specific guidance by emergency staff or without any guidance at all. The stadium simulation revealed a significantly faster evacuation time if the crowd was guided and the egress was controlled by emergency staff. If there was no egress control whatsoever, the evacuation time for all visitors increased significantly.

Summary

Savannah Simulations conducted a simulation study for a planned sports arena in Switzerland. It confirmed that the simulated evacuation time complied to the national buildings codes. In addition, design improvements for the stadium operations could be recommended and were later implemented.



One of the other significant results of the evacuation simulation was the fact that stadium exits, especially the turnaround space in front of the exits, were too narrowly designed to allow safe egress under high pedestrian pressure. Stadium exits were then re-designed to improve flow rates and decrease potentially dangerous pressures.

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