

Timeline Analysis with ASET and RSET

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‘Timeline analysis’ was applied in performance-based design for many big construction projects with difficulties to comply with the prescriptive fire safety codes. Both the Available Safe Egress Time (ASET) and the Required Safe Egress Time (RSET) are estimated and compared. Six points of concern are identified for this approach. Small fire scenarios of only up to 5 MW were used in very big halls in shopping malls and deep underground public transport interchanges for getting longer ASET. RSET was not estimated under crowded conditions to give quick values of evacuation time. The ‘safety margin’ (though this term should be watched) was only taken as a small percentage of RSET.

Therefore, more realistic fire scenarios with higher heat release rate should be applied to get reasonable values of ASET in the new projects. Higher ‘safety margin’ of multiples of ASET should be provided to cater for uncertainties.

Fire safety management must be enhanced in existing projects with low safety margin, long ASET based on small fire scenarios and short RSET with low design occupant loading. This must be urgently applied to crowded areas such as public transport interchanges and deep underground subway stations without adequate fire safety provisions.

Reference

[W.K. Chow, “Six points to note in applying timeline analysis in performance-based design for fire safety provisions in the Far East”, International Journal on Engineering Performance-Based Fire Codes, Vol. 10, No. 1, pp. 1-5 \(2011\).](#)