

UQ Fire Project #2020.03

APPLICATION OF THE MAXIMUM ALLOWABLE DAMAGE (MAD) METHODOLOGY

Advisory Team

Dr David Lange (d.lange@uq.edu.au); Mr Jaime Cadena Gomez (je.cadena@uq.edu.au)

Keywords: fire, design, risk, application.

Background and motivation

Risk based fire safety design is a common tool for the justification for the acceptability of an alternative solution to the fire safety design of a building. However such an approach is open to criticism on a number of grounds, not least of which is the fact that the results are prone to significant variation as a result of the skill and craft of the engineer carrying out the assessment.

Therefore, for systems with a potential for large loss due to fires, managing the probability of these events might not be an effective way to manage risk. An alternative approach is to understand the maximum damage potential of the system and if it is larger than the maximum allowable damage, manage it. This approach is the basis for the Maximum Allowable Damage (MAD) methodology, an alternative approach to risk assessment which provides information to better manage risk. The MAD methodology has been the subject of PhD research at UQ and is approaching maturity. The aim of this project is to provide a further case study to test the methodology further in application.

Research objectives

- 1) Implement the MAD methodology to a case study in fire safety engineering exploring the performance criteria of life safety
- 2) Explore the potential justification of changes to the fire safety strategy based on the results of the analysis using the MAD methodology
- 3) If time permits, to explore the potential for further performance criteria to be implemented in the same methodology

Methodology

The methodology for this project requires the identification of a suitable case study building for assessment. The fire safety strategy for this building should then be designed and analysed using the MAD methodology. Along with this process the research student should identify and describe the uncertainties associated with the fire strategy. The research student should expect to do some simple modelling as part of this analysis.

The student carrying out this thesis should have completed FIRE 3700 (introduction to fire safety engineering).

This project would suit an 8-unit thesis.