



**Professor Mark G Stewart** BE, PhD, FIEAust, CPEng  
Australian Research Council Professorial Fellow  
Director, Centre for Infrastructure Performance and Reliability  
School of Engineering  
The University of Newcastle  
Newcastle NSW 2308 Australia

Phone: +61 2 4921 6027

Email: mark.stewart@newcastle.edu.au

Mark G. Stewart is Professor of Civil Engineering and Director of the Centre for Infrastructure Performance and Reliability at The University of Newcastle in Australia. He was awarded a BE from Monash University in 1984, and a PhD from The University of Newcastle in 1988.

He is the co-author of *Probabilistic Risk Assessment of Engineering Systems* (Chapman & Hall, 1997) and *Terror, Security, and Money: Balancing the Risks, Benefits, and Costs of Homeland Security* (Oxford University Press, 2011), as well as more than 300 technical papers and reports. He has more than 25 years of experience in probabilistic risk and vulnerability assessment of infrastructure and security systems that are subject to man-made and natural hazards. Mark has received over \$3 million in Australian Research Council (ARC) support in the past 10 years.

Mark has significant expertise in time and spatial dependent reliability analysis of new and existing deteriorating structures such as bridges and buildings. This has utility for assessing the safety and service-life prediction of new and existing structures. In collaboration with the CSIRO, Mark is also assessing the impact of climate change on damage and safety risks to infrastructure, and assessing the cost-effectiveness of engineering adaptation strategies. He is also a leading investigator with the reliability-based calibration of the Australian Masonry and Concrete Codes.

Since 2004, Mark has received extensive ARC support to develop probabilistic risk-modelling techniques for infrastructure subject to military and terrorist explosive blasts and cost-benefit assessments of counter-terrorism protective measures for critical infrastructure. In 2011, he received a five-year Australian Professorial Fellowship from the ARC to continue and to extend that work.

#### **Areas of expertise:**

- Risk-based optimisation of safety assessment and maintenance of deteriorating infrastructure
- Life-cycle cost optimisation for maintenance of deteriorating infrastructure
- Terrorism and security risks and blast damage to built infrastructure
- Cost-effectiveness of security and infrastructure protective measures
- Risk Assessment and Cost-effectiveness of climate change adaptation measures
- Time-dependent structural and serviceability reliability

#### **Career highlights:**

- Australian Professorial Fellowship (ARC) - *Probabilistic Terrorism Risk Assessment and Risk Acceptability for Infrastructure Protection*.
- 11 Australian Research Council grants worth \$3 million.
- 3 books including *Probabilistic Risk Assessment of Engineering Systems* and *Terror, Security and Money: Balancing the Risks, Benefits and Costs of Homeland Security*.
- 118 journal publications + 180 conference papers and research reports.
- Seven keynote lectures at international conferences in Europe and China.
- Consultant to CSIRO Climate Adaptation Flagship, Geoscience Australia, RTA of NSW, and Coffey Geosciences.

## **Awards**

R.W. Chapman Medal - Institution of Engineers, Australia - 1997

Citation: *For a paper which is considered to be the most important contribution to the science and/or practice of structural engineering.*

Paper: "A Rectangular Stress Block for High Strength Concrete Based on Probabilistic Analysis" published in Civil Engineering Transactions (co-authored with M.M. Attard from the University of NSW).

K&C Award - 7<sup>th</sup> International Conference on Shock & Impact Loads on Structures – 2007

Citation: Award for Original and Outstanding Paper presented at SI07 Conference.

Paper: "Safety Hazard and Damage Risks for Monolithic Window Glazing Subject to Explosive Blast Loading" (co-authored with PhD student M.D. Netherton)

CI Premier Award - 8<sup>th</sup> International Conference on Shock & Impact Loads on Structures – 2009

Citation: Award for Original and Outstanding Paper presented at SI09 Conference.

Paper: "Risk Assessment and Cost-Effectiveness of Infrastructure Protection"

## **Publications**

### Books

1. Stewart, M.G. and Melchers, R.E. (1997), *Probabilistic Risk Assessment of Engineering Systems*, Chapman & Hall, London, 274 p.
2. Stewart, M.G. and Melchers, R.E. (2003), *Probabilistic Risk Assessment of Engineering Systems*, Kluwer Academic (Japanese Translation).
3. Mueller, J. and Stewart, M.G. (2011), *Terror, Security and Money: Balancing the Risks, Benefits and Costs of Homeland Security*, New York and Oxford, UK: Oxford University Press, September 2011.

### Edited Conference Proceedings

1. Melchers, R.E. and Stewart, M.G. (1993), *Probabilistic Risk and Hazard Assessment*, A.A. Balkema, Netherlands.
2. Melchers, R.E. and Stewart, M.G. (1995), *Integrated Risk Assessment: Current Practice and New Directions*, A.A. Balkema, Netherlands.
3. Stewart, M.G. and Melchers, R.E. (1998), *Integrated Risk Assessment: Applications and Regulations*, A.A. Balkema, Netherlands.
4. Melchers, R.E. and Stewart, M.G. (1999), *Eighth International Conference on Applications of Statistics and Probability in Civil Engineering*, A.A. Balkema, Netherlands.
5. Stewart, M.G. (2005), *Structural Engineering – Preserving and Building into the Future*, Proceedings of the Australian Structural Engineering Conference, Newcastle.
6. Reid, S.G. and Stewart, M.G. (2007), *International Forum on Engineering Decision Making: Optimal Strategies for Disaster and Hazard Mitigation*, Sydney University Press, Sydney.

### Invited Keynotes:

1. Reliability and Risk Assessment of Deteriorating Structures, *Japanese Symposium on Material and Structural Reliability*, Tokyo, 2002.
2. Implementing Impact Assessments and Risk Mitigation Strategies, *Infrastructure Protection and*

*Security Forum*, Melbourne, 2006.

3. Risk Assessment and Optimisation of Blast Mitigation Strategies for Design and Strengthening of Built Infrastructure, *1<sup>st</sup> International Conference on Analysis and Design of Structures against Explosive and Impact Loads*, Tianjin, China, 2006.
4. Probabilistic Assessment of Corrosion Damage and Optimal Timing of Maintenance for RC Structures, *Bridge and Infrastructure Research in Ireland*, Dublin, 2006.
5. Spatial and Time-Dependent Reliability Modelling of Corrosion Damage, Safety and Maintenance for RC Structures, *1<sup>st</sup> International Conference on Construction Heritage in Coastal and Marine Environments*, Lisbon, Portugal, 2008.
6. Condition Assessment, Time-Dependent Reliability and Remaining Service Life Prediction for Deteriorating Structures, *4<sup>th</sup> International Symposium on Lifetime Engineering of Civil Infrastructure*, Changsha, China, 2009.
7. Life-Cycle Cost Optimisation Of Maintenance Strategies For RC Structures In Chloride Environments, *Bridge and Concrete Research in Ireland*, Cork, 2010.

#### Book Chapters

1. Stewart, M.G. (2008), Structural Reliability, in *Encyclopedia of Quantitative Risk Assessment and Analysis*, E. Melnick and B. Everitt (eds.), Wiley, Chichester, UK, 1712-1715.
2. Stewart, M.G. and Hao, H. (2010), Structural Reliability Analysis and Service Life Prediction for Structural Health Monitoring, in *Structural Health Monitoring in Australia*, T.Chan (ed.), World Scientific Publishing.

#### Refereed Journal Papers

1. Stewart, M.G. and Melchers, R.E. (1988), Simulation of Human Error in a Design Loading Task, *Structural Safety*, 5(4):285-297
2. Stewart, M.G. and Melchers, R.E. (1989), Decision Model for Overview Checking of Engineering Designs, *International Journal of Industrial Ergonomics*, 4:19-27.
3. Stewart, M.G. and Melchers, R.E. (1989), Error Control in Member Design, *Structural Safety*, 6(1):11-24.
4. Stewart, M.G. and Melchers, R.E. (1989), Checking Models in Structural Design, *Journal of Structural Engineering*, ASCE, 115(6):1309-1324.
5. Stewart, M.G. and Melchers, R.E. (1989), Optimization of Structural Design Checking, *Journal of Structural Engineering*, ASCE, 115(10):2448-2460.
6. Stewart, M.G. and Melchers, R.E. (1989), Structural Design and Design Checking, *Civil Engineering Transactions*, I.E. Aust., CE31(1):63-69.
7. Stewart, M.G. (1990), Safe Load Tables and the Human Dimension, *Steel Construction*, AISC, 24(1):2-12.
8. Stewart, M.G. (1990), Human Error in Steel Beam Design , *Civil Engineering Systems*, 7(2):94-101.
9. Stewart, M.G. (1991), Probabilistic Risk Assessment of Quality Control and Quality Assurance Measures in Structural Design, *IEEE Transactions on Systems, Man, and Cybernetics* , 21(5):1000-1007.
10. Stewart, M.G. (1991), Safe Load Tables: A Design Aid in the Prevention of Human Error, *Structural Safety*, 10(4):269-282.
11. Stewart, M.G. (1991), The Human Dimension and Risk Analysis in Structural Design, *Civil Engineering Transactions*, CE33(3):195-202.

12. Stewart, M.G. (1992), Modelling Human Error Rates for Human Reliability Analysis of a Structural Design Task, *Reliability Engineering and System Safety*, 36:171-180.
13. Stewart, M.G. (1992), A Human Reliability Analysis of Reinforced Concrete Beam Construction, *Civil Engineering Systems*, 9(3):227-247.
14. Stewart, M.G. (1992), Simulation of Human Error in Reinforced Concrete Design, *Research in Engineering Design*, 4(1):51-60
15. Stewart, M.G. (1993), Structural Reliability and Error Control in Reinforced Concrete Design and Construction, *Structural Safety*, 12:277-292.
16. Stewart, M.G. (1993), Modelling Human Performance in Reinforced Concrete Beam Construction, *Journal of Construction Engineering and Management*, ASCE, 119(1):6-22.
17. Murphy, S.A. and Stewart, M.G. (1993), Analysis of Public Buildings Damaged in the 1989 Newcastle Earthquake, *Civil Engineering Transactions*, IEAust, CE35:187-201.
18. Stewart, M.G. (1995), Probability of Serviceability Failure of Reinforced Concrete Office Floors, *Civil Engineering Transactions*, IEAust, CE37(2):149-158.
19. Stewart, M.G. (1995), Workmanship and its Influence on Probabilistic Models of Concrete Compressive Strength, *ACI Materials Journal*, American Concrete Institute, 9(4):361-372.
20. Stewart, M.G. and Rosowsky, D.V. (1995), Quality Control and Factors of Safety for Reinforced Concrete Design, *Concrete in Australia*, Concrete Institute of Australia, 21(2):10-11.
21. Stewart, M.G. (1996), Serviceability Reliability Analysis of Reinforced Concrete Structures, *Journal of Structural Engineering*, ASCE, 122(7):794-803.
22. Stewart, M.G. (1996), Optimisation of Serviceability Reliability for Structural Steel Beams, *Structural Safety*, 18(2/3):225-238.
23. Attard, M.M. and Stewart, M.G. (1996), A Rectangular Stress Block for High Strength Concrete Based on Probabilistic Analysis, *Civil Engineering Transactions*, IEAust, CE38(2,3, and 4):111-120.
24. Stewart, M.G. (1997), Concrete Workmanship and its Influence on Serviceability Reliability, *ACI Materials Journal*, American Concrete Institute, 94(6):501-509.
25. Stewart, M.G. (1997), Time-Dependent Reliability of Existing RC Structures, *Journal of Structural Engineering*, ASCE, 123(7):896-903.
26. Stewart, M.G. (1998), Reliability-Based Bridge Design and Assessment, *Progress in Structural Engineering and Mechanics*, 1(2):214-222.
27. Attard, M.M. and Stewart, M.G. (1998), A Two Parameter Stress Block for High Strength Concrete, *ACI Structural Journal*, American Concrete Institute, 95(3):305-317.
28. Stewart, M.G. and Rosowsky, D.V. (1998), Time-Dependent Reliability of Deteriorating Reinforced Concrete Bridge Decks, *Structural Safety*, 20(1):91-109.
29. Val, D., Stewart, M.G. and Melchers, R.E. (1998), Effect of Reinforcement Corrosion on Reliability of Highway Bridges, *Engineering Structures*, 29(11):1010-1019.
30. Stewart, M.G. and Rosowsky, D.V. (1998), Structural Safety and Serviceability of Concrete Bridges Subject to Corrosion, *Journal of Infrastructure Systems*, ASCE, 4(4):146-155.
31. Stewart, M.G. and Attard, M.M. (1999), Model Errors and Structural Reliability for High Strength Concrete Column Design, *Australian Journal of Structural Engineering*, 1(3):167-177.
32. Stewart, M.G. and Attard, M.M. (1999), Reliability and Model Accuracy for High Strength Concrete Column Design, *Journal of Structural Engineering*, ASCE, 125(3):290-300.
33. Stewart, M.G. and Val, D. (1999), Role of Load History in Reliability-Based Decision Analysis of Ageing Bridges, *Journal of Structural Engineering*, ASCE, 125(7):776-783.
34. Val, D., Stewart, M.G. and Melchers, R.E. (2000), Life-Cycle Performance of Reinforced Concrete Bridges: Probabilistic Approach, *Journal of Computer Aided Civil and Infrastructure Engineering*, 15(1):14-25.

35. Faber, M.H., Val, D., and Stewart, M.G. (2000), Proof Load Testing for Assessment and Upgrading of Bridges, *Engineering Structures*, 22(12):1677-1689.
36. Rosowsky, D.V., Stewart, M.G. and Khor, E.H. (2000), Early-Age Loading and Long-Term Deflections of Reinforced Concrete Beams, *ACI Structural Journal*, 97(3):517-524.
37. Epaarachchi, D., Stewart, M.G. and Rosowsky, D.V. (2000), Design, Workmanship and System Risk of Multi-Storey Buildings During Construction, *Australian Journal of Structural Engineering*, IEAust, 3(1&2):43-54.
38. Stewart, M.G. (2000), Risk-Based Optimisation of Repair Strategies for Concrete Structures Considering Life-Cycle Cost Analysis, *Concrete in Australia*, Concrete Institute of Australia, 26(2):21-25.
39. Vu, K. and Stewart, M.G. (2000), Structural Reliability of Concrete Bridges Including Improved Chloride-Induced Corrosion Models, *Structural Safety*, 22:313-333.
40. Stewart, M.G. (2001), Risk-Based Approaches to the Assessment of Ageing Bridges, *Reliability Engineering and System Safety*, 74(3):263-273.
41. Stewart, M.G. (2001), Effect of Construction and Service Loads on Reliability of Existing RC Buildings, *Journal of Structural Engineering*, 127(10):1232-1235.
42. Khor, E.H., Rosowsky, D.V. and Stewart, M.G. (2001), Probabilistic Analysis of Time-Dependent Deflections of RC Flexural Members, *Computers and Structures*, 79:1461-1472.
43. Rosowsky, D.V. and Stewart, M.G. (2001), A Probabilistic Load Model for RC Multistory Construction, *Journal of Performance of Constructed Facilities*, ASCE, 15(4):145-152.
44. Hossain, N.B. and Stewart, M.G. (2001), Probabilistic Models of Damaging Deflections for Floor Elements, *Journal of Performance of Constructed Facilities*, ASCE, 15(4):135-140.
45. Stewart, M.G., Rosowsky, D.V. and Val, D.V. (2001), Reliability-Based Bridge Assessment Using Risk-Ranking Decision Analysis, *Structural Safety*, 23:397-405.
46. Stewart, M.G. and Lawrence, S. (2002), Structural Reliability of Masonry Walls in Flexure, *Masonry International*, 15(2):48-52.
47. Val, D. and Stewart, M.G. (2002), Safety Factors for Assessment of Existing Structures, *Journal of Structural Engineering*, ASCE, 128(2):258-265.
48. Epaarachchi, D., Stewart, M.G. and Rosowsky, D.V. (2002), Concrete Workmanship and Reliability of Multi-storey Buildings During Construction, *Journal of Structural Engineering*, ASCE, 128(2):205-213.
49. Hossain, N. B., and Stewart, M. G. (2002). Serviceability Reliability and Expected Costs for RC Beams Designed to Serviceability Specifications of AS3600. *Australian Journal of Structural Engineering*, 4(1):17-28.
50. Pukl, R., Teply, B., Novák D. and Stewart M.G. (2002), Modeling of Precast Prestressed Bridge Girder under Corrosion Attack. *Beton TKS*, 3:50-54 (in Czech).
51. Teply, B., Kralova, H. and Stewart, M.G. (2002), Ambient Carbon Dioxide, Carbonation and Deterioration of RC Structures, *International Journal of Materials and Structural Reliability*, 1(1):31-36.
52. Stewart, M.G., Rosowsky, D.V. and Huang, Z. (2003), Hurricane Risks and Economic Viability of Strengthened Construction, *Natural Hazards Review*, ASCE, 4(1):12-19.
53. Faber, M.H. and Stewart, M.G. (2003), Risk Assessment for Civil Engineering Facilities: Critical Overview and Discussion, *Reliability Engineering and System Safety*, 80(2):173-184.
54. Stewart, M.G. (2003), Cyclone Damage and Temporal Changes to Building Vulnerability and Economic Risks for Residential Construction, *Journal of Wind Engineering and Industrial Aerodynamics*, 69:671-691.
55. Val, D.V. and Stewart, M.G. (2003), Life Cycle Cost Analysis of Reinforced Concrete Structures in Marine Environments, *Structural Safety*, 25(4):343-362.

56. Stewart, M.G. and Val, D.V. (2003), Multiple Limit States and Expected Failure Costs for Deteriorating RC Bridges, ASCE, *Journal of Bridge Engineering*, 8(6):405-415.
57. Epaarachchi, D. and Stewart, M.G. (2004), Human Error and Reliability of Multi-Storey RC Buildings During Construction, *Journal of Performance of Constructed Facilities*, ASCE, 18(1):12-20.
58. Stewart, M.G. (2004), Risk Assessment as a Decision-Making Tool to Mitigate Blast Damage to Built Infrastructure, *Australian Journal of Multi-disciplinary Engineering: Engineering a Secure Australia*, IEAust, 1-12.
59. Stewart, M.G., Estes, A.C. and Frangopol, D.M. (2004), Bridge Deck Replacement for Minimum Expected Cost Under Multiple Reliability Constraints, *Journal of Structural Engineering*, ASCE, 130(9):1414-1419.
60. Stewart, M.G. (2004), Spatial Variability of Pitting Corrosion and its Influence on Structural Fragility and Reliability of RC Beams In Flexure, *Structural Safety*, 26(4):453-470.
61. Val, D.V. and Stewart, M.G. (2005), Decision Analysis for Deteriorating Structures, *Reliability Engineering and System Safety*, 87(3):377-385.
62. Vu, K.A.T. and Stewart, M.G. (2005), Predicting the Likelihood and Extent of RC Corrosion-Induced Cracking, *Journal of Structural Engineering*, ASCE, 131(11):1681-1689.
63. Vu, K.A.T., Stewart, M.G. and Mullard, J.A. (2005), Corrosion-Induced Cracking: Experimental Data And Predictive Models, *ACI Structural Journal*, 102(5):719-726.
64. Stewart, M.G. and Love, A. (2005), Uncertainty, Economic Risk Analysis and Risk Acceptance Criteria for Mine Subsidence, *Australian Geomechanics*, 40(1):79-89.
65. Stewart, M.G. (2006), Spatial Variability of Damage and Expected Maintenance Costs for Deteriorating RC Structures, *Structure and Infrastructure Engineering*, 2(2):79-90.
66. Stewart, M.G., Netherton, M.D. and Rosowsky, D.V. (2006), Terrorism Risks and Blast Damage to Built Infrastructure, *Natural Hazards Review*, ASCE, 7(3):114-122.
67. Darmawan, M.S. and Stewart, M.G. (2006), Effect of Spatially Variable Pitting Corrosion on Structural Reliability of Prestressed Concrete Bridge Girders, *Australian Journal of Structural Engineering*, 6(2):147-158.
68. Stewart, M.G. and Netherton, M.D. (2006), Performance, Reliability and Security Risks of Glazing Subject to Explosive Blast Loading, *Australian Journal of Structural Engineering*, 7(1):23-36.
69. Stewart, M.G. (2006), Risk Assessment and Optimisation of Blast Mitigation Strategies for Design and Strengthening of Built Infrastructure, *Transactions of Tianjin University*, 12(Sept. Suppl):8-15.
70. Darmawan, M.S. and Stewart, M.G. (2007), Effect of Pitting Corrosion on Capacity of Prestressing Wires, *Magazine of Concrete Research*, 59(2):131-139.
71. Stewart, M.G. and Mullard, J.A. (2007), Spatial Time-Dependent Reliability Analysis of Corrosion Damage and the Timing of First Repair for RC Structures, *Engineering Structures* 29(7):1457-1464.
72. Darmawan, M.S. and Stewart, M.G. (2007), Spatial Time-Dependent Reliability Analysis of Corroding Pretensioned Prestressed Concrete Bridge Girders, *Structural Safety*, 29(1):16-31.
73. Stewart, M.G. Mullard, J.A., Drake, B.J. and Al-Harthy, A.S. (2007), Utility of Spatially Variable Damage Performance Indicators for Improved Safety and Maintenance Decisions of Deteriorating Infrastructure, *Civil Engineering and Environmental Systems*, 24(2):149-163.
74. Stewart, M.G. and Lawrence, S.J. (2007), Model Error, Structural Reliability and Partial Safety Factors for Structural Masonry in Compression, *Masonry International*, 20(3):107-116.

75. Stewart, M.G. and Al-Harthy, A. (2008), Pitting Corrosion and Structural Reliability of Corroding RC Structures: Experimental Data and Probabilistic Analysis, *Reliability Engineering and System Safety*, 93(3):273-382.
76. Stewart, M.G. and Netherton, M.D. (2008), Security Risks And Probabilistic Risk Assessment of Glazing Subject to Explosive Blast Loading, *Reliability Engineering and System Safety*, 93(4):627-638.
77. Stewart, M.G. (2008), Cost-Effectiveness of Risk Mitigation Strategies For Protection of Buildings Against Terrorist Attack, *Journal of Performance of Constructed Facilities*, ASCE, 22(2):115-120.
78. Stewart, M.G. and Mueller, J. (2008), A Cost-Benefit and Risk Assessment of Australian Aviation Security Measures, *Security Challenges*, 4(3):45-61.
79. Stewart, M.G. and Mueller, J. (2008), A Risk and Cost-Benefit and Assessment of U.S. Aviation Security Measures, *Journal of Transportation Security*, 1(3):143-159.
80. Heffler L.M., Stewart, M.G., Masia, M.J. and Correa, M.R.S. (2008), Statistical Analysis and Spatial Correlation of Flexural Bond Strength for Masonry Walls, *Masonry International*, 21(2):59-70.
81. Stewart, M.G. and O'Rourke, A. (2008), Probabilistic Risk Assessment of Mine Subsidence, *Australian Geomechanics*, 43(3):1-12.
82. Stewart, M.G. (2008), Risk Acceptability and Cost-Effectiveness of Protective Measures Against Terrorist Threats to Built Infrastructure Considering Multiple Threat Scenarios, *Transactions of Tianjin University*, 14(5):313-317.
83. Stewart, M.G. (2009), Mechanical Behaviour of Pitting Corrosion of Flexural and Shear Reinforcement and its Effect on Structural Reliability of Corroding RC Beams, *Structural Safety*, 31(1):19-30.
84. Val, D., Chernin, L. and Stewart, M.G. (2009), Experimental and numerical investigation of corrosion-induced cover cracking in RC structures, *Journal of Structural Engineering*, ASCE, 135(4):376-385.
85. Stewart, M.G. and Suo, Q. (2009), Extent of Spatially Variable Corrosion Damage as an Indicator of Strength and Time-Dependent Reliability of RC Beams, *Engineering Structures*, 31(1):198-207.
86. Netherton, M.D. and Stewart, M.G. (2009), Probabilistic Modelling of Safety Hazard and Damage Blast Risks for Window Glazing, *Canadian Journal of Civil Engineering*, 36(8):1321-1331.
87. Netherton, M.D. and Stewart, M.G. (2009), The Effects of Explosive Blast Load Variability on Safety Hazard and Damage Risks for Monolithic Window Glazing, *International Journal of Impact Engineering*, 36(12):1346-1354.
88. Stewart, M.G. (2009), Life Safety Risks and Optimisation of Protective Measures Against Terrorist Threats to Infrastructure, *Structure and Infrastructure Engineering*, (in press).
89. Lawrence, S.J. and Stewart, M.G. (2009), Reliability-based Calibration of the Capacity Reduction Factor for Design of Masonry in Compression to AS3700, *Australian Journal of Structural Engineering*, 9(2):97-110.
90. Val, D. and Stewart, M.G. (2009), Reliability Assessment of Ageing Reinforced Concrete Structures – Current Situation and Future Challenges, *Structural Engineering International*, 19(2):211-219.
91. Suo, Q. and Stewart, M.G. (2009), Corrosion Cracking Prediction Updating of Deteriorating RC Structures Using Inspection Information, *Reliability Engineering and System Safety*, 94(8):1340-1348.

92. Mullard, J.A. and Stewart, M.G. (2009), Stochastic Assessment of the Timing and Efficiency of Maintenance for Corroding RC Structures, *Journal of Structural Engineering*, ASCE, 135(8):887-895.
93. Stewart, M.G. (2011), Spatial and Time-Dependent Reliability Modelling of Corrosion Damage, Safety and Maintenance for Reinforced Concrete Structures, *Structure and Infrastructure Engineering*, (in press).
94. Stewart, M.G. and Li, Y. (2010), Methodologies for Economic Impact and Adaptation Assessment of Cyclone Damage Risks Due to Climate Change, *Australian Journal of Structural Engineering*, 10(2):121-135.
95. Zhai, X. and Stewart, M.G. (2010), Structural Reliability Analysis of Reinforced Grouted Concrete Block Masonry Walls in Compression, *Engineering Structures*, 32(1):106-114.
96. Stewart, M.G. (2010), Acceptable Risk Criteria for Infrastructure Protection, *International Journal of Protective Structures*, 1(1):23-39.
97. Stewart, M.G. (2010), Risk-Informed Decision Support for Assessing the Costs and Benefits of Counter-Terrorism Protective Measures for Infrastructure, *International Journal of Critical Infrastructure Protection*, 3(1):29-40.
98. Stewart, M.G. (2010), Reliability Safety Assessment of Corroding RC Structures Based on Visual Inspection Information, *ACI Structural Journal*, 107(6):671-679.
99. Stewart, M.G. and Peng, J. (2010), Life Cycle Cost Assessment of Climate Change Adaptation Measures to Minimise Carbonation-Induced Corrosion Risks, *International Journal of Engineering Under Uncertainty: Hazards, Assessment and Mitigation*, 2(1-2): 35-46.
100. Wei, X and Stewart, M.G. (2010), Model Validation and Parametric Study on the Blast Response of Unreinforced Brick Masonry Walls, *International Journal of Impact Engineering*, 37(11):1150-1159.
101. Mueller, J. and Stewart, M.G. (2010), Hardly Existential: Thinking Rationally About Terrorism, *Foreign Affairs*, April 2.
102. Netherton, M.D. and Stewart, M.G. (2010), Blast Load Variability and Accuracy of Blast Load Prediction Models, *International Journal of Protective Structures*. 1(4):543-570.
103. Hao, H., Stewart, M.G., Li, Z-X. and Shi, Y. (2010), RC Column Failure Probabilities to Blast Loads, *International Journal of Protective Structures*. 1(4):571-591.
104. Mullard, J.A. and Stewart, M.G. (2011), Corrosion-Induced Cover Cracking: New Test Data and Predictive Models, *ACI Structural Journal*, 108(1):71-79.
105. Al-Harthy, A. and Stewart, M.G. (2011), Concrete Cover Cracking Caused by Steel Reinforcement Corrosion, *Magazine of Concrete Research*, 63(9):655-667.
106. Lawrence, S.J. and Stewart, M.G. (2011), Model Error and Structural Reliability for Unreinforced Masonry in Vertical Bending, *Masonry International*, 24(1): 23-30.
107. Li, Y. and Stewart, M.G. (2011), Cyclone Damage Risks Caused by Enhanced Greenhouse Conditions and Economic Viability of Strengthened Residential Construction, *Natural Hazards Review*, 12(1):9-18.
108. Stewart, M.G., Wang, X. and Nguyen, M. (2011), Climate Change Impact and Risks of Concrete Infrastructure Deterioration, *Engineering Structures*, 33(4):1326-1337.
109. Chernin, L., Val, D.V. and Stewart, M.G. (2011), Prediction of Cover Crack Propagation in Reinforced Concrete Structures Caused by Corrosion, *Magazine of Concrete Research* (in press).
110. Al Harthy, A.S., Stewart, M.G. and Mullard, J.A. (2011), Concrete Cover Cracking Caused by Reinforcement Corrosion, *Magazine of Concrete Research* (in press).
111. Bjarnadottir, S., Li, Y. and Stewart, M.G. (2011), A Probabilistic-based Framework for Impact and Adaptation Assessment of Climate Change on Hurricane Damage Risks and Costs, *Structural Safety*, 33(3): 173-185.

112. Mullard, J.A. and Stewart, M.G. (2011), Life-Cycle Cost Assessment of Maintenance Strategies for RC Structures in Chloride Environments, *ASCE Journal of Bridge Engineering* (in press).
113. Bjarnadottir, S., Li, Y. and Stewart, M.G. (2011), Social Vulnerability Index for Coastal Communities at Risk to Hurricane Hazard and a Changing Climate, *Natural Hazards* (in press).
114. Stewart, M.G., Ellingwood, B.R. and Mueller, J. (2011), Homeland Security: A Case Study in Risk Aversion for Public Decision-Making, *International Journal of Risk Assessment and Management*. (in press).
115. Wang, X., Stewart, M.G. and Nguyen, M. (2011), Impact of Climate Change on Corrosion and Damage to Concrete Infrastructure in Australia, *Journal of Climatic Change* (in press).
116. Stewart, M.G. and Mueller, J. (2011), Cost-Benefit Analysis of Advanced Imaging Technology Fully Body Scanners for Airline Passenger Security Screening, *Journal of Homeland Security and Emergency Management*, 8(1): Article 30.
117. Mueller, J. and Stewart, M.G. (2011), Balancing the Risks, Benefits, and Costs of Homeland Security, *Homeland Security Affairs*, 7, Article 16.
118. Mueller, J. and Stewart, M.G. (2011), Witches, Communists, and Terrorists: Evaluating the Risks and Tallying the Costs, *Human Rights*, 38(1): 20-22.

#### Refereed Conference Papers

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### Competitive Research Funding

Investigators	Source	Project	Duration	Amount
Stewart	UNewc	Reduction of Human Error in Structural Design	1989-1990	\$10,000
Stewart	ARC-SG	Probabilistic Risk Assessment for the Construction Industry	1991-1992	\$19,000
Stewart	UNewc	Human Reliability Analysis of Structural Systems	1993-1994	\$20,000
Stewart & Melchers	ARC-SG	Probabilistic Risk Assessment of Multi-Storey Concrete Building Construction	1995-1998	\$56,000
Stewart	ARC-SG	Risk-Based Optimisation of Reinforced Concrete Design	1996	\$8,500
Stewart & Melchers	ARC-LG	Probabilistic Measures of Reinforced Concrete Serviceability Performance	1997-1999	\$121,000
Melchers & Stewart	RIBG	Computational Support for Time-Dependent Reliability Analysis	1997-1999	\$138,000
Stewart	UNewc	Decision Model for Assessment of Bridge Protective Strategies	1998	\$9,500
Stewart	UNewc	Measurement of Crack Development using Accelerated Corrosion Tests	1999	\$12,000
Stewart	CBPI* Grant	Reliability-Based Performance of Structural Masonry * Clay Brick and Paver Institute	1999	\$5,000
Stewart	UNewc	Bayesian Methods for Updating Inspection Data for Reinforced Concrete Structures	2000	\$8,000

Franks & Stewart	UNewc	Development of Pipe Network Asset Management Framework to Incorporate variable Environmental Factors	2000	\$17,000
Stewart, Melchers, Val	ARC-LG	Uncertainty Modelling and Probability-Based Assessment for Ageing Concrete Structures	2001-2003	\$186,000
Stewart & Totoev	UNewc	Strength Prediction and Structural Reliability of Structural Masonry in Two-way Bending	2002	\$7,800
Stewart	UNewc	Corrosion-Induced Cracking and Random Field Modelling of Concrete Structures	2003	\$15,000
Melchers, Stewart	ARC-DP	Modelling and Integration of Spatial Time-Dependent Variability in Structural Reliability Analysis	2004-2006	\$217,000
Stewart	UNewc	Spatial Reliability Modelling of Corrosion Damage to Concrete Structures	2004	\$13,200
Stewart	CBPI* Grant	Investigations of Safety Levels in Masonry Designed to AS3700	2003-2004	\$28,000
Melchers, Stewart, Mulcahy	ARC-LP	A study of the correlation between pre- and post- demolition performance assessment for prestressed concrete beams in a 45 year old major road bridge	2004-2007	\$85,600
Stewart	ARC-DP	Risk assessment and mitigation of blast damage to structural systems	2005-2007	\$208,000
Stewart, Masia, Page, Lawrence	ARC-LP	Stochastic Modelling of Strength and Reliability of Masonry Walls Loaded in Flexure and Compression	2006-2009	\$104,000
Melchers, Stewart	ARC-DP	Modelling of Damage Progression and its Effects on the Expected Safety and Satisfactory Performance of Existing Reinforced Concrete Infrastructure	2007-2009	\$240,000
Stewart	CRC-CIEAM	Integrated Health Monitoring System for Civil Infrastructure in Operational Environments	2007-2009	\$170,000
Stewart	CBPI Grant	Reliability-Based Safety Assessment of Structural Masonry in Flexure Designed to AS3700	2007-2008	\$34,500
Stewart	ARC-DP	Stochastic Modelling of Structural Facade Damage and Occupant Safety Risks Due to Explosive Blast Loading	2008-2010	\$320,000
Curtis, Val, Stewart	EPSRC	Built Infrastructure for Older People in Conditions of Climate Change	2009-2011	£401,000
Melchers, Stewart	ARC-DP	Remaining Life Estimation for Existing Deteriorating Reinforced Concrete Infrastructure	2010-2012	\$320,000
Foster, Stewart	ARC-LP	A Re-evaluation of the Safety and Reliability Indices for Reinforced Concrete Structures	2010-2012	\$210,000
Stewart	ARC-APF	Probabilistic Terrorism Risk Assessment and Risk Acceptability for Infrastructure	2011-2015	\$850,000

		Protection		
Stewart	CSIRO	Risk Assessment of Infrastructure Climate Adaptation Measures for Extreme Wind Events	2011	\$50,000

ARC = Australian Research Council

### **Editorial Boards**

- Structural Safety
- International Journal of Structure and Infrastructure Engineering
- International Journal of Protective Structures
- Australian Journal of Structural Engineering
- The Open Civil Engineering Journal

### **Consulting**

- CSIRO and Department of Climate Change (climate change impact on concrete infrastructure deterioration)
- Roads and Traffic Authority of NSW (reliability assessment of existing bridge)
- Orica Australia (expert review of reliability of NAP1 stack tower upgrade)
- Geoscience Australia (vulnerability of glazing to blast damage)
- Coffey Geosciences (risk of subsidence of underground coal mines)
- Energy Australia (durability of footings in contaminated soils)
- BHP Engineering (structural steel capacity tables)