

## Ramsay Maunder Associates Quality Statement

### Overview of RMA

Ramsay Maunder Associates (RMA) provide consultancy services to the engineering industry in both the UK and further afield. We are specialists in stress analysis and in using the finite element method to obtain practical solutions to engineering problems, e.g., *assessment of failure* and in working alongside a client's design engineering team to provide *design analysis* services. Design analysis may include ensuring that a client's design satisfies the appropriate code of practice or standard and RMA have longstanding experience in the understanding and application of such codes and standards, e.g., the Eurocodes of practice for steel and reinforced concrete etc.

RMA's projects are drawn from both structural and mechanical fields of engineering and the company directors and associates, who oversee all work carried out at RMA, are members or fellows of these institutions (IStructE and IMechE). RMA only take on commercial projects that we feel confident we can add value for the client. If there is some risk involved in a potential project then this will be discussed with the client before proceeding. Some clients ask RMA to sign a non-disclosure agreement and we are happy to do this and will respect the clients request for confidentiality.

### R&D at RMA

In addition to commercial projects RMA also undertake R&D work, often collaborating with industry experts and academics. This initiative is aimed at maintaining RMA's reputation as being at the sharp-end in our chosen field of engineering endeavour. RMA's website provides a *knowledge-base* that can be freely explored to see how our R&D work impacts on practical engineering:

<http://www.ramsay-maunder.co.uk/knowledge-base/>

### Quality Assurance at RMA

In terms of quality management of numerical simulation processes such as the finite element method RMA feel that the standard ISO9001 approach is not appropriate and will not provide the client with any significant reassurance that work is being conducted reliably. Instead, RMA prefer to adopt best industry practice of Verification & Validation (V&V) as laid down in the American Society of Mechanical Engineers (ASME) standard 'V&V 10 Verification & Validation in Computational Structural Mechanics'. The National Agency for Finite Element Methods and Standards (NAFEMS), now an international organisation but retaining the original acronym, offer practical guidance, education and certification in the field of V&V which RMA follow in their work. For the uninitiated, V&V is, essentially, a modern application of the Scientific Method to numerical simulation and the Napoleonic Code of Jurisprudence, '***guilty until proven innocent***' is an adage that RMA follow in their analysis work.

It is important that the client has visibility of the application of the V&V being adopted in RMA's work and we endeavour to supply this in the form of, particularly, verification studies to demonstrate that the finite element software being used is capable of solving the client's engineering problem correctly and that sufficient mesh refinement has been used to provide accurate results. In terms of finite element software, RMA use one of the two industry standard software packages (ANSYS or ABAQUS) and adopt a leasing model in order to ensure that we are always using the latest version.

RMA's business relies on our reputation for providing robust and reliable engineering solutions to the engineering problems that our clients bring to us. The ongoing maintenance and development of our reputation is key to our success as we move forward and we endeavour to do this through our R&D and by being involved in organisations that promote best engineering practice in our field of work.

### Qualifications and Experience of Key RMA Personnel

RMA is a small engineering consultancy run by Angus Ramsay and supported by Edward Maunder. We also employ a range of associates in our work who provide additional expertise on which we can call should it be required. RMA can provide an independent technical review of the work we conduct. This is sometimes essential when our work will ultimately be scrutinised by industry regulators in, for example, the highly regulated nuclear industry. In a recent project, we employed an expert from an engineering consultancy who had worked extensively on nuclear projects for Babcock at the Devonport Dockyard. This provided RMA's client with confidence that our work was sound and the client was able to provide the following testimonial to his company's satisfaction with our work:

*"We at Nirvana Engineering required independent verification of an essential supplies seismic battery rack destined for an EDF nuclear site. The project required FE modelling of the proposed rack structure, supported battery system and the projected earthquake loadings. We engaged Ramsay Maunder Associates to undertake this work and found their diligence second to none. They excelled at every level throughout the project and I would not hesitate to recommend their services to any prospective client."*

A brief overview of the key RMA personnel is given below:

#### **Engineering/Managing Director at RMA: Angus Ramsay, MEng, PhD, CEng, FIMechE**

- Member of the NAFEMS Education & Training Working Group (ETWG)
- Founding member of the NAFEMS Professional Simulation Engineering (PSE) Scheme
- Interviewer and Advisor for the NAFEMS PSE Scheme
- Independent Technical Editor for the NAFEMS Benchmark Challenge initiative
- Reviewer for the American Society of Civil Engineering, Journal of Structural Engineering
- Associate at Frazer-Nash Consultancy
- Technical Expert at Cadogans now HKA Global, an Expert Witness Company
- Visiting Research Fellow at Nottingham Trent University (1997 – 2000)
- Honorary University Fellow at the University of Exeter (2000 – 2010)
- Author of some thirty papers/articles on the FE method and its practical application

## Technical Director at RMA: Edward Maunder, MA, DIC, PhD, CEng, FStructE

- Chairman (2006-7) of the Devon & Cornwall Branch of the Institution of Structural Engineers (IStructE)
- Member of the Academic Qualifications Panel at the IStructE
- Holder of a Leverhulme Trust Emeritus Fellowship (2005-7)
- Honorary University Fellow at the University of Exeter
- Co-Author of a book on Equilibrium Finite Element Formulations (Wiley 2017)
- Author of over 100 papers/articles on the FE method and its practical application
- Reviewer for IStructE, Finite Elements in Analysis and Design, Computers & Structures, International Journal for Numerical Methods in Engineering, amongst others.

### Closure

RMA is a small engineering consultancy who are able, by dint of low overheads, to provide competitive quotations for assisting clients with their engineering projects. Whilst we are a small company, our key personnel and associates, who conduct or oversee our work, are highly qualified engineering professionals who, in addition to our commercial work, contribute to the corpus of knowledge in terms of R&D and work with national and international engineering organisation, towards the ongoing development of sound engineering practice in our field of endeavour.

RMA does not hold formal quality certification, e.g., ISO9001, but prefers to adopt best industry practice as defined in the various ASME and NAFEMS codes of practice and advice to practising engineers. The adoption of methodologies that go back to the Scientific Method has proven successful in RMA's business and it is one we continue to adopt in all our work.

Clients need to have visibility that best practice is being adopted for their project and this is supplied in our reports in the form of essential verification studies. It is RMA's approach to conduct our work under the scrutiny of the client and we adopt an interactive process whereby the client can observe the development of our work and interact when necessary.

This quality statement has been written to provide reassurance to prospective clients that RMA's business has been developed on sound principles and is capable of providing clients with reliable engineering solutions to the problems that they face and for which they need external expertise.

If you have any queries regarding RMA's approach or credibility then please do not hesitate to contact us at:

[angus\\_ramsay@ramsay-maunder.co.uk](mailto:angus_ramsay@ramsay-maunder.co.uk)

We will endeavour to assist you in developing trust in RMA as your supplier of engineering expertise.