

Newsletter | May 09

ENGINEERING DUE DILIGENCE



Welcome to the May 2009 edition of the R2A Newsletter.

Recent projects at R2A include Availability Profiling for the Gladstone Area Water Board, Availability Profiling for the S.T.a.P.S. Alliance for Melbourne Water's Eastern Treatment Plant, various risk reviews for trains in Victoria, a bushfire due diligence review as well as a flood due diligence review as a result of the bushfires.

R2A also recently commissioned an independent Client Satisfaction Survey completed by *Leading Matters* on R2A's behalf. The feedback from the survey was invaluable and will be used to continually improve our business and services we provide. The R2A Board would like to thank those Clients who took the time to willingly participate in the survey. It is greatly appreciated.

Upcoming R2A Conference Papers & Presentations

Dust Explosions 2009, Engineering Due Diligence & SIL Allocation for explosion control systems (10 June, Penrith)

This presentation emphasises that the courts are always right (after the event) and that this means that threat & criticality is logically prior to hazard & risk. It also outlines a SIL (safety and integrity level per IEC 61508) allocation process which has been used to satisfy relevant fire authorities, regulators and legal counsel in NSW and Queensland. (See www.informa.com.au/dustexplosions for further information)

QLD RES Technical Presentation - ISO 31000 - the new international risk management standard (10 June 2009, Brisbane)

Richard Robinson will provide a context by presenting a personal appreciation of the strengths and weakness of AS4360. This will be followed by Prof Jean Cross (a member of the drafting committee of ISO 31000) outlining key features of the new standard. (Contact: Lauren Moon at Lmoon@engineersaustralia.org.au for registration).

ITEE College (WA Group) Engineers Australia (17 July 2009, Perth)
System Safety Due Diligence - Tools & Techniques

(Mike Dean & Richard Robinson)

This presentation describes a minimum set of tools and techniques that have been used in Australian jurisdictions to demonstrate due diligence in complex technological systems. This includes software safety allocation requirements under IEC 61508. (For further information contact: Dr Geoff Roy at geoff@cadplan.com.au).

ENA Earthing Seminar (31st July 2009, Sydney)

Engineering Due Diligence - Earthing Systems (Richard Robinson)

This presentation will outline a process to enable the development of robust engineering due diligence arguments for known earthing hazards. It will use the issue of abnormal voltage rises on water pipes as a case study (presented with permission from EnergySafe Victoria). (Contact Than Doan at than.dovan@sp-ausnet.com.au for further details).

Introducing Lisa Xu

Lisa has recently joined the team in Melbourne as Office Co-ordinator.



Courses

Scheduled dates for Risk and Liability (Engineering Due Diligence) Public Courses presented by Richard Robinson are as follows:

Adelaide: 4-5 August

Brisbane: 27-28 May, 21-22 October

Canberra: 16-17 June

Melbourne: 7-8 May, 17-18 September

Perth: 23-24 June, 18-19 September

Sydney: 26-27 August

See the EEA website www.eeaust.com.au for further details and registration.

Richard is also providing EEA in-house courses for Defence, Canberra and Powerlink, Brisbane.

All courses use the revised 7th edition of the R2A Text. This is available for purchase direct from R2A Melbourne or EABooks for \$100 plus GST and P&H.

Due Diligence Not Risk

R2A has changed its functional description from *risk* engineers to *due diligence* engineers. The reasons for this can be explained in a number of ways. Two important arguments concern the inability of science to accurately measure risk and the compartmentalisation of risk services.

Risk as Science

When risk became popularised in the late 20th century, it was on the basis that risk was essentially scientific in nature. This new risk science meant that society’s risk acceptability levels could be objectively determined and that technical people could repeatedly agree on the actual level of risk associated with a situation or circumstance. This would enable effective and fair risk allocation and control. Such a belief gave rise to the ideas of target levels-of-risk and safety. It enabled tripartite philosophies as owners, workers and government could easily agree on risk levels for all industry. It encouraged Australian parliaments to legislate to provide penalties to those who did not undertake such risk assessments.

As it turned out, it is simply not true that risk is wholly scientific in nature. Two risk experts seldom agree on the risk associated with identical scenarios. The reason seems to be that risk is not wholly a property of the natural-material time-space universe. There are elements of human values embedded throughout. The future uncertainty under consideration is a human one with all of the encoded value systems this implies. The global financial crises is a case in point.

The issue that now appears is that risk as a stand alone concept cannot arbitrate human futures. A broader concept is required.

The diagram below represents an R2A view of the domain breakdown in western philosophy, adapted from 19th century.

In the technological risk business for example, formal philosophy is being applied as formal methods in safety critical systems analysis, natural philosophy is being applied as Navier-Stokes equations in CFD modelling and moral philosophy as the musings of our courts as they determine with hindsight what ought to have been the case after it has all come to grief.

In this context, engineering due diligence is the predicted ethical performance of our material infrastructure. This means that infrastructure should be safe (not harmful) and useful (achieve what it sets out to do).

Compartmentalisation of Risk Services

A second aspect has been the compartmentalisation of risk services in the last few years. A great hope of the risk movement last century was that the unifying nature of the risk science would provide a homogeneity between different service provider domains.

The idea was that risk could be objectively used for safety analysis, finance risk analysis, security risk analysis, environmental risk analysis thereby enabling a meeting of the minds encompassing a wholistic, competent view of an enterprise. Such a view meant that a single risk register, for example, could present the entire risk profile of an enterprise and present senior decision makers with an complete and intuitively comprehensible list.

In practice, this has not been the case. Apart from the different risk profiles assumed by the primary risk advice providers (market upside/downside, safety/ downside only, and project downside from an assumed upside position etc - see the February 2009 edition of the R2A newsletter) the individual silos of risk services have actually become stronger.

For technological risk, for example, there are major, robust compartmentisations, including, ergonomists (Ergonomics Society), OH&S (Safety Institute) , industrial hygienists (AIOH), building surveyors, fire engineers (SFS), MHF specialists, safety psychologists etc. Each group has its own risk analysis paradigm.

The only concept that R2A has seen that bridges these paradigms is the ethical position embodied in the common law. That is, ensuring prior to the event that all reasonable practicable precautions are in place. And, providing such insight is what R2A does. Hence the need to be due diligence engineers rather than risk engineers.

Formal Philosophy <i>(Logic)</i>	Natural Philosophy <i>(Science)</i>	Moral Philosophy <i>(Design & Ethics)</i>
<i>The universal and necessary laws of reason.</i>	<i>Knowledge about the natural material time space universe acquired using rational principles (logic).</i>	<p><i>Consideration of what ought to be and how this can best be achieved. It results in:</i></p> <p>Social Infrastructure <i>The implementation of an ethic which modifies our social institutions and conventions.</i></p> <p>Material Infrastructure <i>The implementation of a design which changes the natural material time space universe.</i></p>