

The lead article discusses cooperation between Australian and Brazilian asset management bodies. Also included are articles on fatigue modelling, standards harmonisation, rail maintenance restructuring and a new product.

Compiled by Kirill Reztsov.

New book to focus on leadership and culture

by John Hardwick, João Ricardo Barusso Lafraia and Peter Kohler

Leadership and culture are crucial to enabling the successful application of the discipline of asset management. Asset management-focused organisations proactively apply these concepts to become and distinguish themselves as high-performing organisations.

For example, many of the entrants into the Asset Management Council's Asset Management Awards have a high level of asset management maturity, and have developed a supporting corporate culture that is capable of change and continual improvement. These organisations are enabled by an output-focused, inclusive and flexible leadership style from their key stakeholders. Together with an effective management system, this leads to successful asset management organisations in a holistic business sense (return on investment), a safety sense (risk) and an asset management sense (outcomes).

Asset management maturity determines how successfully an organisation applies all principles of asset management, to achieve several beneficial ends. Maturity can be used to guide asset management capability

improvement across a project, division, or an entire organisation. It can also be used to determine how well the organisation's asset management processes compare to best practice, and to identify the areas where improvement can be made. A mature organisation also informs external customers and suppliers of how well the organisation's asset management capability compares to best practice, as well as meeting the contractual requirements of customers. This allows senior management to measure these factors to address a key issue in the governance role of CEOs and boards to key stakeholders: asset management assurance.

With the release of ISO 55000, the *Asset Management Standard*, in the next 12 months, public demand for information on the value and role of asset management will be high. However, the ISO gives little information as to the application of cultural, leadership and maturity elements of asset management beyond the application of the documented asset management principles. Further, Certification against ISO 55001 only identifies a minimum level of accomplishment, which or may not meet the



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needs of individual businesses. The curiosity and thirst for knowledge in the asset management community will require information “beyond ISO”, as standards cannot, by their nature, adequately deal with leadership, culture and maturity.

To promote and facilitate these concepts, the Asset Management Council (a technical society of Engineers Australia) and ABRAMAN (Brazilian Association of Asset Management and Maintenance) are jointly developing a new book on the key roles played by leadership and culture.

The book is intended for anyone interested in asset management that delivers “fit for purpose” and “safe to use” assets. It is particularly relevant to CEOs and board members in providing a foundation of knowledge that will support their business through the safe and economic use of physical assets. Likewise, it is pertinent to community leaders in providing a foundation of knowledge that will support public infrastructure.

The ingredients of this book are a combination of knowledge and the practical experience of members of the two peak bodies.

The book builds upon work previously developed in South America in the discipline of safety and produced in the Portuguese. From the perspective of both organisations, the exploration of these concepts across both language and cultural barriers has not only been a fascinating exercise, but has proved to be a very rewarding undertaking. It has demonstrated conclusively the international significance of these concepts.

Further, it shows how closely aligned the Asset Management Council and ABRAMAN are with the understanding and practical relevance of these concepts to both Australian and Brazilian asset management communities. ■

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Peter Kohler is a member of the ISO Asset Management Committee.

Understanding steam and thermal fatigue

by Mike Myers and Patrick Mischler

Structural integrity analysis is helping asset owners better understand the risk of damage to their infrastructure and the mitigation measures they can employ to avoid costly equipment replacement.

Queensland government-owned energy provider CS Energy, whose asset portfolio comprises the Kogan Creek, Callide and Wivenhoe power stations, identified unstable steam temperatures entering the reheater collection headers in the Kogan Creek 750MW supercritical boiler. As fluctuating temperatures can cause thermal fatigue damage, the company engaged engineering consultancy Aurecon to investigate and determine the structural integrity and future life of the 9Cr-1Mo-V (P91) reheater headers.

Engineering need

Unstable steam temperatures have been acknowledged by industry as a significant contributor to thermal fatigue damage and cracking, especially in the ligaments between tube holes on the internal surface of collection headers. Stresses are generated by through-wall temperature gradients, which form when the metal surface is heated or cooled relative to the average wall temperature.

Experience has shown that the severity of the stress is caused by variables such as tube-hole spacing and ligament dimensions, temperature ramp rate, the material's thermal expansion coefficients and header design thickness.

The cracking of ligaments has been a leading cause of header replacements in super-heater headers, reheater headers, economiser headers in coal and gas fired boilers. It also affects high pressure, intermediate pressure and low pressure super-heater and evaporator headers in heat recovery steam generators.

Aurecon's approach to investigating the risk of ligament cracking was to:

- identify the typical operating characteristics of the plant
- simulate the thermal and mechanical stresses acting on the equipment
- calculate the time to crack initiation using creep-fatigue interaction procedures.

Obtaining data

Aurecon engineers accessed CS Energy's data collection systems to obtain thermocouple data from key locations associated with the headers – the tube metal temperature, header steam temperature, and header buried (mid-wall)