

## IPENZ ENGINEERING UPDATE July 2009



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## Management/Leadership/Strategic Planning/Recruitment/Training and Development/Project Management/Corporate Responsibility

### √IPENZ 26/01 The end of rational economics.

Ariely, D. Harvard Business Review, Volume 87 Issue 7 (July 2009) Pages 78-84.

Standard economic theory assumes that human beings are capable of making rational decisions and that markets and institutions, in the aggregate, are healthily self-regulating. But the global economic crisis, argues Ariely, has shattered these two articles of faith and forced us to confront our false assumptions about the way markets, companies, and people work. So where do corporate managers – who are schooled in rational assumptions but run messy, often unpredictable businesses – go from here? In this lively article, the author, a professor of behavioral economics at Duke University, shows how the emerging discipline of behavioral economics can help businesses better defend against foolishness and waste. Smart organizations will develop a behavioral economics capability by hiring qualified experimenters and conducting small trials that build on one another, revealing a radically different view of how people make decisions. Revenge and cheating are only two of the irrational behaviors that companies will find underlying their employees' and customers' actions. Once an understanding of irrationality is embedded in the fabric of an organization, a behavioral economics approach can be applied to virtually every area of the business, from governance and employee relations to marketing and customer service.

### √IPENZ 26/02 Flame resistant clothing : its role in protecting electric line workers from arc flash burns.

Wulf, K. Professional Safety, Volume 54 Issue 6 (June 2009) Pages 52-57.

### √IPENZ 26/03 Pandemic preparation : what businesses can do.

Professional Safety, Volume 54 Issue 6 (June 2009) Pages 36-39.

### √IPENZ 26/04 Four fatal flaws of strategic planning.

Barrows, E. Harvard Management Update, Volume 14 Issue 4 (April 2009) Pages 1-5.

Four crucial flaws of strategic planning processes in business are discussed in this article. If these four can be avoided, the processes and results can be improved. Good strategic planning utilises several tools of strategic analysis and managers must be convinced that strategy can be built in a day.

### √IPENZ 26/05 Buying wisely : Don't shortchange the procurement process, it can cost you in the long run.

Greer, S. Mechanical Engineering, Volume 130 Issue 10 (October 2008) Pages 39-41.

**√IPENZ 26/06 A comprehensive model for planning and controlling contractor cash-flow.**

Gorog, M. International Journal of Project Management, Volume 27 Issue 5 (July 2009) Pages 481-492.

**√IPENZ 26/07 Work-life balance in the Australian and New Zealand surveying profession.**

Wilkinson, J. Structural Survey, Volume 26 Issue 2 (2008) Pages 120-130.

The aim of this paper is to investigate work-life balance policies in the surveying profession on both sides of the Tasman. According to the paper it is imperative to understand the levels of awareness of work-life balance so that benchmarking can be carried out and comparisons made with other professions. A questionnaire survey was undertaken to discover awareness levels and found that there is uneven spread. This is an important area to consider in light of shortages of professionals and pressure on existing employees. The consequences of imbalances between work and life affect not only the employee and family but also the company. Therefore the benefits of adopting policies on work-life balance are highlighted.

**√IPENZ 26/08 Leadership is prime: How do you measure leadership excellence?**

Kanji, K. Total Quality Management & Business Excellence, Volume 19 Issue 4 (April 2008) Pages 417-427.

For a long time, leadership has been a topic of interest to both academics and practitioners. Even though there is extensive literature on leadership, there are almost no models that explain how it works and how to measure Leadership Excellence. In the Business Excellence Model, the important role of leadership becomes very clear, not just as one more criterion but as the prime aspect (Kanji, 2002) responsible for driving the organisation towards quality and excellence. This paper presents a structural model of leadership utilising the critical success factors implicated in the Leadership Excellence Index. This reflects the simultaneous performance of leaders in the roles of establishing and sharing the values, developing and communicating the vision, defining the mission, selecting and implementing a strategy and managing other operational key issues within the organisation. Such a methodology arises in innovative leadership measures and helps to identify leadership areas that need closer attention.

**√IPENZ 26/09 The development and empirical validation of the Employee Satisfaction Index Model.**

Hsu, S. and Wang, Y. Total Quality Management & Business Excellence, Volume 19 Issue 4 (April 2008) Pages 353-366.

While 'People are the most important asset of any organisation' is often heard, in reality little thought is given to employee satisfaction. However employee satisfaction is of prime importance as it determines the success or failure of the customer experience. This study offers an Employee Satisfaction Index (ESI) model that aims to explore the causal relationship of employee satisfaction. 132 employees of a high-tech firm were surveyed. Partial Least Squares (PLS) was used to test the theoretical model and to derive an ESI score.

**√IPENZ 26/10 Global terrorism for project management professionals.**

Cost Engineering, Volume 51 Issue 5 (May 2009) Pages 21-27.

**√IPENZ 26/11 Does it pay to be good?**

Trudel, R and Cotte, J. MIT Sloan Management Review, Volume 50 Issue 2 (Winter 2009) Pages 61-68.

Do customers really want to pay more for goods that have been produced ethically?

**√IPENZ 26/12 Corporate environmentalism.**

MacLean, R. Environmental Quality Management, Volume 17 Issue 3 (Spring 2008) Pages 109-112.

Some companies who claim to be environmentally responsible are viewed by the author of this article as hypocritical because they act sustainably in one area but not in others. Two companies who come under fire here are Toyota Motor Corp. and General Electric Co.

**√IPENZ 26/13 The Dangers of distraction.**

Harvard Management Update, Volume 14 Issue 3 (March 2009) Pages 1-5.

An interview of author Maggie Jackson is provided. Her views of multitasking are based on her book "Distracted: The Erosion of Attention and the Coming Dark Age" The possible effects of constant interruption and disruption are explained in addition to the impact of distraction on professional relationships.

**√IPENZ 26/14 Innovation in megaprojects: Systems integration at London's Heathrow Terminal 5.**

Davies, A., Gann, D and Douglas, T. California Management Review, Volume 51 Issue 2 (Winter 2009) Pages 101-125.

Innovative practices in megaprojects is the topic of this article and it describes the megaproject involved with the work on Terminal 5 at Heathrow Airport. A systems integration model is developed by the authors to illustrate how organisations can overcome problems in megaprojects.

**√IPENZ 26/15 The 10 trends you have to watch.**

Beinhocker, E., Davis, I and Mendonca, L. Harvard Business Review, Volume 87 Issue 7 (July 2009) Pages 55-60.

Executives are beginning to look to the future after spending a full year in crisis mode. As they reengage in strategic thinking, they will need to continually assess the changing economic landscape – and they can effectively do that by keeping a close watch on the underlying forces outlined in this article. The authors, from McKinsey & Company, discuss the current trajectories of 10 particularly important trends: strains on natural resources, a damper on globalization, the loss of trust in business, the growing role of government, investment in quantitative decision tools, shifting patterns of global consumption, the economic rise of Asia, industry structure upheaval, technological innovation, and price instability. Companies' strategic behavior should be tied closely to these trajectories.

## Technical Aspects of Engineering

√IPENZ 26/16 R. H. Wood's 'The stability of tall buildings': a contemporary view.

King, C. Proceedings of the Institution of Civil Engineers : Structures and Buildings, Volume 161, Issue SB5 (October 2008) Pages 243-246.



√IPENZ 26/17 Historical paper: The stability of tall buildings.

Wood, R. H. Proceedings of the Institution of Civil Engineers : Structures and Buildings, Volume 161, Issue SB5 (October 2008) Pages 247-263.

√IPENZ 26/18 Implications of pyritic rockfill on performance of embankment dams.

Cambridge, M. Dams and Reservoirs, Volume 18, Issue 2 (July 2008) Pages 63-69.

√IPENZ 26/19 Design of a reinforced embankment on compressible soil.

Swift, G. M. and Jones, D. R. V. Proceedings of the Institution of Civil Engineers : Waste and Resource Management, Volume 160, Issue WR4 (November 2007) Pages 145-154.

√IPENZ 26/20 Validation of shoring made of HDPE pipe or CGS pipe normally used for culverts and sewers.

Lan, A et al. Practice Periodical on Structural Design and Construction (ASCE), Volume 11 Issue 1 (2006) Pages 39-49.

√IPENZ 26/21 Battery Park trunk sewer emergency tunnel project.

Rybak, M. Mining Engineering, Volume 60 Issue 12 (December 2008) Pages 28-32.

Describes a fast track, design and construction of an emergency by pass tunnel for a collapsed sewer

√IPENZ 26/22 Stochastic response of underground structures.

Haciefendioglu, K and Bayraktar, A. Proceedings of the Institution of Civil Engineers : Geotechnical Engineering, Volume 161, Issue GE6 (December 2008) Pages 325-339.

√IPENZ 26/23 Making the most of underground communication networks.

Engineering and Mining Journal, Volume 209 Issue 9 (November 2008) Pages 124-127.

Underground mine communications systems are necessarily costly. Using them to boost productivity improves the ROI.

√IPENZ 26/24 **Recycling surfacing materials back into thin surfacing systems.**

Nicholls, J. C et al. Proceedings of the Institution of Civil Engineers : Construction Materials, Volume 161, Issue CM3 (August 2008) Pages 105-112.

√IPENZ 26/25 **The effect of recycling rate and asphalt binder on the performance of recycled asphalt concrete for airport pavement rehabilitation.**

Su, K., Hachiya, Y and Maekawa, R. Road Materials and Pavement Design, Volume 10 Issue 2 (2009) Pages 361-371.



√IPENZ 26/26 **Modelling of mechanical properties of cement concrete incorporating reclaimed asphalt concrete.**

Mathias, V., Sedran, T and de Larrard, F. Road Materials and Pavement Design, Volume 10 Issue 1 (2009) Pages 63-82.

√IPENZ 26/27 **Design and construction of a submarine outfall in Murcia, Spain.**

Hernandez, T. et al. Proceedings of the Institution of Civil Engineers : Maritime Engineering, Volume 161 Issue MA3 (September 2008) Pages 107-115.

√IPENZ 26/28 **Breaking car use habits: The effectiveness of a free one-month travelcard.**

Thogersen, J and Moller, B. Transportation, Volume 35 Issue 3 (May 2008) Pages 329-345.

√IPENZ 26/29 **The great electric car race.**

Taylor, A. Fortune, Volume 159 Issue 8 (27 April 2009) Pages 32-42,45-49.

√IPENZ 26/30 **The feasibility of long range battery electric cars in New Zealand,**

Duke, M., Andrews, D and Anderson, T. Energy Policy, Volume 37, Issue 9 (September 2009) Pages 3455-3462.

√IPENZ 26/31 **Integrating private transport into renewable energy policy: The strategy of creating intelligent recharging grids for electric vehicles.** Andersen, P., Mathews, J and Rask, M. Energy Policy, Volume 37 Issue 7 (July 2009) Pages 2481-2486.

√IPENZ 26/32 **Combining heating and power using microturbines in a major hotel.**

Wagner, T et al. ASHRAE Transactions, Volume 115 Issue 1 (2009) Pages 208-219.

√IPENZ 26/33 **Going green in Greensboro (world's first LEED Platinum-certified hotel).**

Millikan, J and Holder, T. Heating/Piping/Air Conditioning HPAC Engineering, Volume 80 issue 10 (October 2008) Pages 20-29.

√IPENZ 26/34 **Solar enhanced wastewater treatment in waste stabilization ponds.**

Agunwamba, J., Utsev, J., and Okonkwo, W. Water Environment Research, Volume 81 Issue 5 (2009) Pages 540-545.

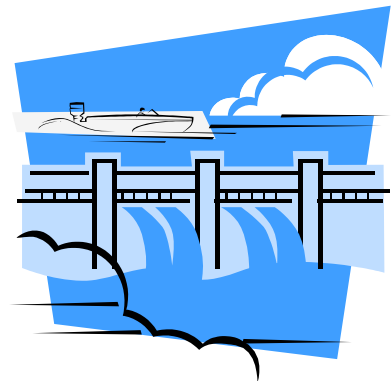
√IPENZ 26/35 **An innovative in-vessel tunnel composting system.**

Webb, A. L. Proceedings of the Institution of Civil Engineers : Waste and Resource Management, Volume 160, Issue WR1 (February 2007) Pages 27-31.

√IPENZ 26/36 **An energy optimization model for a combined heat and power production energy supply system with a heat pump.**

Dragicevic, D and Bojic, M. Proceedings of the Institution of Mechanical Engineers.: Part A Journal of Power and Energy, Volume 223, Issue A4 (June 2009) Pages 321-328.

## Special focus topic Drinking Water



√IPENZ 26/37 **Are there health risks from the migration of chemical substances from plastic pipes into drinking water? A review.**

Stern, B and Lagos, G. Human & Ecological Risk Assessment, Volume 14 Issue 4 (July/August 2008) Pages 753-779.

This review assesses the literature concerned with the use of plastic pipes and the occurrence of regulated and unregulated substances in drinking water. The possible health hazards are characterised and the uncertainties linked to human health and exposure that require further research are described. An important public health concern relates to sensitive populations and their potential exposure to short-term increases in leachates as well as additive or synergistic impacts. The measurement of contaminants takes place in the distribution system and not at the tap. To improve health protection, compounds that migrate from plastic pipes into drinking water should be identified and human exposure to these substances better quantified.

√IPENZ 26/38 **Sampling drinking water: Methods and problems.**

Fritzke, J. Materials Performance, Volume 48 Issue 5 (May 2009) Pages 56-58.

√IPENZ 26/39 **Drinking water regulations: Estimated cumulative energy use and costs.**

Reiling, S et al. American Water Works Association Journal, Volume 101 Issue 3 (March 2009) Pages 42-53.

√IPENZ 26/40 **Cincinnati's drinking water contamination warning system: Goes through full-scale exercise.**

Fencil, J and Hartman, D. American Water Works Association Journal, Volume 101 Issue 2 (February 2009) Pages 52-55.

**√IPENZ 26/41 Piping systems and the ecological safety of drinking water supply.**

Bukhin, V. International Polymer Science and Technology, Volume 36 Issue 6 (2009) Pages T59-T63. Russia faces the problem of supplying quality and sufficient drinking water, and also heat. More than half of the systems for water, sewage and heating are worn out, with pipeline failures growing in number. This means resources have to be allocated for emergency repair rather than scheduled replacement of piping or new pipelines. New materials and technologies are needed to address the issue of reliability and ecological safety of urban water supply systems. This paper reports on a round-table of politicians, public figures and press representatives.

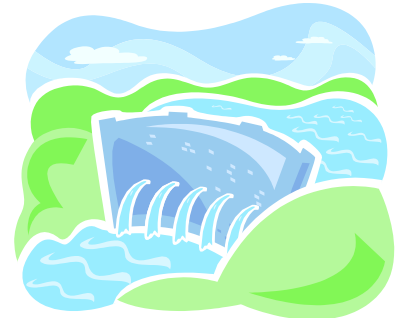
**√IPENZ 26/42 Microfiltration and ultrafiltration membranes for drinking water.**

American Water Works Association Journal, Volume 100 Issue 12 (December 2008) Pages 84-97.

**√IPENZ 26/43 Combining occurrence and toxicity information to identify priorities for drinking-water mixture research.**

Ryker, S and Small, M. Risk Analysis: An International Journal, Volume 28 Issue 3 (June 2008) Pages 653-666.

This paper proposes analysing occurrence information on drinking water mixtures in order to prioritise and inform approaches to research in mixture toxicology. A recent collection of national ground-water quality data was utilised to evaluate proposed US Environmental Protection Agency and Agency for Toxic Substances and Disease Registry models of noncancer mixture toxicity. From the results a relative value of additional toxicological information was estimated for each mixture. It was found, for instance, that while arsenic and cadmium levels in US drinking water are not likely to produce synergistic cardiovascular effects, the mixture's potential for synergistic neurological effects should be studied



**√IPENZ 26/44 Prevalence of bacterial contamination with antibiotic-resistant and enterotoxigenic fecal coliforms in treated drinking water.** Pathak, S and Gopal, K. Journal of Toxicology & Environmental Health: Part A, Volume 71 Issue 7 (April 2008) Pages 427-433.

**√IPENZ 26/45 Sensor response to contamination in chloraminated drinking water.**

Szabo, J. American Water Works Association Journal, Volume 100 Issue 4 (April 2008) Pages 33-34,36,38,40.

**√IPENZ 26/46 A novel technology to improve drinking water quality using natural treatment methods in rural Tanzania.**

Mbogo, S. Journal of Environmental Health, Volume 70 Issue 7 (March 2008) Pages 46-50.

**√IPENZ 26/47 E. coli as a public health indicator of drinking water quality.**

Standridge, J. American Water Works Association Journal, Volume 100 Issue 2 (February 2008) Pages 65-75.

√IPENZ 26/48 **Disinfection of drinking water by UV irradiation: Basic principles - specific requirements - international implementations.**

Sommer, R et al. Ozone: Science & Engineering, Volume 30 Issue 1 (January/February 2008) Pages 43-48.

√IPENZ 26/49 **Deriving uncertainty factors for threshold chemical contaminants in drinking water.**

Ritter, L et al. Journal of Toxicology & Environmental Health: Part B, Volume 10 Issue 7 (October/November 2007) Pages 527-557.

√IPENZ 26/50 **Iron and copper release in drinking-water distribution systems.**

Shi, B and Taylor, J. Journal of Environmental Health, Volume 70 Issue 2 (September 2007) Pages 29-36, 44, 46.

√IPENZ 26/51 **Contaminant transport in a municipal drinking water supply: A steady-state approach to estimate rate and uncertainty.**

Bergvall, M. et al. Ambio, Volume 36 Issue 6 (September 2007) Pages 512-519.

A key factor when evaluating and classifying environmental risk of polluted areas is contaminant transport. A steady-state approach was utilised in this study to estimate the transit time and concentration of a pesticide contaminating a city drinking water supply. It appears that reliable first estimates of transit time and concentration can be derived when using this steady-state approach, however a dynamic model seems more appropriate when it comes to improving concentration predictions of degrading contaminants.



√IPENZ 26/52 **Pilot study on pre-ozonation enhanced drinking water treatment process.**

Pei, Y et al. Ozone: Science & Engineering, Volume 29 Issue 5 (September/October 2007) Pages 317-323.

√IPENZ 26/53 **Chlorinated disinfection by-products in drinking water according to source, treatment, season, and distribution location.**

Rodriguez, M et al. Journal of Environmental Engineering and Science, Volume 6 Issue 4 (July 2007) Pages 355-365.

√IPENZ 26/54 **Environmental health indicators in New Zealand: Drinking water - a case study.**

Khan, R et al. EcoHealth, Volume 4 Issue 1 (March 2007) Pages 63-71.

√IPENZ 26/55 **Fluoride in drinking water: A review on the status and stress effects.**

Ayoub, S and Gupta, A. Critical Reviews in Environmental Science & Technology, Volume 36 Issue 6 (November 2006) Pages 433-487.

√IPENZ 26/56 **Model for estimating acute health impacts from consumption of contaminated drinking water.**

Murray, R et al. Journal of Water Resources Planning & Management, Volume 132 Issue 4 (July 2006) Pages 293-299.

To design public health intervention strategies, disease transmission models are often used. These predict how the disease will spread over time through susceptible, infected and recovered populations. For the health risks linked to using contaminated water, a modified disease model is utilised in conjunction with flow and transport models for water distribution systems. A framework is proposed that provides information about the temporal and spatial spread of health risks. This benefits understanding how vulnerable drinking water systems are to contamination events in addition to aiding the design of public health and water utility strategies to mitigate risks.

√IPENZ 26/57 **Comparison of physical sampling and real-time monitoring strategies for designing a contamination warning system in a drinking water distribution system.**

Janke, R. et al. Journal of Water Resources Planning & Management, Volume 132 Issue 4 (July 2006) Pages 310-313.

It has become a federal and local priority to protect the US water systems from terrorist attacks. To detect contamination events early, a possible monitoring approach using routine sampling and analysis has been suggested.

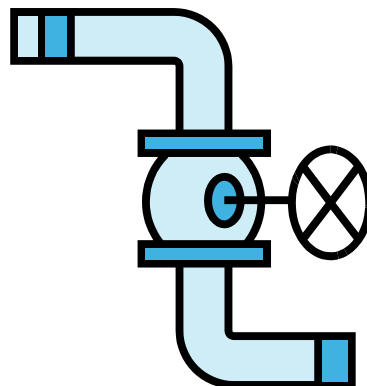
√IPENZ 26/58 **The importance of safe drinking water and sanitary systems for human health and well-being: A personal view.** Watson, C. Building Services Engineering Research & Technology, Volume 27 Issue 2 (May 2006) Pages 85-89.

√IPENZ 26/59 **Pilot plant study on ozonation and biological activated carbon process for drinking water treatment.**

Kong Ling-yu et al. Journal of Environmental Sciences (IOS Press), Volume 18 Issue 2 (March 2006) Pages 232-235.

√IPENZ 26/60 **Drinking-water quality management: The Australian framework.**

Sinclair, M and Rizak, S. Journal of Toxicology & Environmental Health: Part A, Volume 67 Issue 20-22 (2004) Pages 1567-1579.



**√IPENZ 26/61 Managing the microbiological risks of drinking water**

Krewski, D et al. Journal of Toxicology & Environmental Health: Part A, Volume 67 Issue 20-22 (2004) Pages 1591-1617.

Serious health consequences can arise from the microbiological contamination of drinking water, as demonstrated by two recent Canadian disease outbreaks. This paper investigates the influences on the microbiological quality of drinking water and its management. Proposed frameworks can help clarify health risk assessment and risk management and so risks can be characterized, evaluated and controlled. The development of Canada's national guidelines for drinking-water quality are now based on a protocol to assess microbiological risk and a framework to manage risk. The major recommendations in these guidelines are to monitor indicator organisms and to utilise adequate water treatment. The biological characteristics of microbial pathogens must be understood .

**√IPENZ 26/62 Formaldehyde formation during ozonation of drinking water.**

Can, Z and Gurol, M. Ozone: Science & Engineering, Volume 25 Issue 1 (February 2003) Pages 41-52.

**√IPENZ 26/63 Drinking-water risk management principles for a total quality management framework.**

Hrudey, S. Journal of Toxicology & Environmental Health: Part A, Volume 67 Issue 20-22 (2004) Pages 1555-1566.

In the wake of the Walkerton tragedy in Canada, this paper sets out some guiding principles to help develop a practical accreditation standard that will facilitate the capture and codification of the best technical, operating and managerial practices across the drinking-water industry.

**√IPENZ 26/64 Degradation of drinking water treatment plant infrastructure from enhanced coagulation.**

McNeill, L and Edwards, M. Journal of Infrastructure Systems, Volume 9 Issue 4 (2003) Pages 145-156.

**√IPENZ 26/65 Fundamentals of drinking water particle counting.** Prepared by Erika E. Hargesheimer..., Nancy E. McTigue and Carrie M. Lewis. Denver, Colorado American Water Works Association, 2000.



## English for International Engineers – a new Energy Library Service

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Energy Library is launching a new service for international engineers who want to advance their oral and written English communication skills in order to improve their performance at work.

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- The environmental manager's guide to environmental liability insurance.
- Managing social and environmental impact: A new discipline for a new economy.
- Incentives for biodiversity conservation beyond the best management practices: Are forestland owners interested?
- Tilting at windmills? The environmental movement and the emergence of the U.S. wind energy sector.

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